Indian Institute of Science Bangalore

560012

Website :www.iisc.ac.in/opportunities/tenders

Contact: 080-2293 2765/2202/2008

TENDER DOCUMENT

(E-Procurement)

For

"Repairs Restoration works and Renovations to NFSS Lab in Mechanical Engineering Department, IISc"

Tender No: IISc/Tender-06/2019-2020

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SECTION 1: Invitation for Tenders

Tender Notification

Scope of Work	"Repairs Restoration works and Renovations to NFSS Lab in Mechanical Engineering Department, IISc"
Estimated Value of work	Rs 1,06,00,000/-
Period of Work Completion	6 (Six) Months from the date of Work Order
Name of the Client	Indian Institute of Science, Bangalore
Address of the Client Tender Processing Fee	The Project Engineer Indian Institute of Science Bangalore – 560 012 Tel No. 080-2293 2765/2202/2008 e-Mail: office.ccmd@iisc.ac.in
Submission of Tender Document	As per e-procurement portal e-procurement portal- https://eprocure.gov.in/eprocure/app
Amount of Earnest Money to be deposited with the Tender	Rs.1,59,000/-
Last date and Time for online submission (uploading) of tender	21.05.2020 at 1500 hrs.
Date and Time of opening of Tender (Technical Bid)	22.05.2020 at 1530 hrs.
Date and Time of opening of Tender (Financial Bid)	Shall be intimated to technically qualified bidders.

SECTION 2: INSTRUCTIONS TO BIDDERS

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A. General

1. Scope of Tender

The REGISTRAR, Indian Institute of Science invites tenders from eligible Bidders, for "Repairs Restoration works and Renovations to NFSS Lab in Mechanical Engineering Department, IISc" (As defined in these documents). The eligible Bidders may submit tenders.

2. Eligibility Criteria

2.1 Bidders shall not be under a declaration of ineligibility for corrupt and fraudulent practices issued by the Government of India or any State Government of Union of India. (authorized signatory should provide an undertaking).

2.2 Tenders from Joint ventures are not acceptable.

2.3 All Bidders shall provide the required information accurately and sufficient detail
in Section 3:
Qualification Information.

2.4 Any reputed Individual / Company registered with CPWD / KPWD / Railways / MES of Class I Civil Contractors are eligible to apply.

2.5 The Tenderer shall have executed and completed successfully in the last five years i.e., between 2012-13 to 2016-17 a single work of similar nature of value not less than Rs. 53,00,000/-.

2.6 The Tenderer shall have achieved in at least two consecutive financial years a minimum sum of turnover not less than Rs. 2,12,00,000/-in the last five years i.e. 2012-13 to 2016-17.

2.7 Work completion certificate for having completed at least one work of similar nature of value not less than the estimated value of contract certified from the competent authority not below the Rank of Executive Engineer or equivalent shall be uploaded. The work completion certificate shall mention the nature of work, items of work executed and the date of commencement and date of completion of the work.

2.8 The tenderer shall upload the valid and present certificate copies of PAN, GST, Contractor's Registration pass book in technical bid, failing which the tender will be rejected. If necessary bidder shall produce all the original documents for verification.

2.9 If the rate quoted by the Contractor for each category of works is below the estimated value of the work, the contractor should pay the difference of amount in favour of The Registrar, IISc in the form of DD or Pay order or FDR (Fixed deposit receipt) or Bank Guarantee as an additional security deposit before entering into Agreement. The same will be refunded only after satisfactory completion of the work.

2.10 The work shall be carried out as per the directions of the Project Engineer cum Estate Officer and Engineer-in-charge.

2.11 Black listed contractors/in govt/Quasi govt/boards/BBMP etc., are not eligible to quote, if found such tenders will be rejected

2.12 The successful Bidder shall execute an Agreement within 10 days from the date of Receipt of intimation from this office, The Tender Document will form the part and parcel of the agreement, failing which the tender will deem to be get cancelled.

2.13 The material shall be got approved by the Project Engineer cum Estate Officer, IISc before execute the work.

2.14 Further details of the work can be obtained from this office.

2.15 The rates quoted in the schedule shall be inclusive of all applicable taxes (inclusive of GST).

2.16 The IISC. reserves the right to accept / reject any or all the tenders without assigning any reasons.

2.17 The work shall be commenced with all men and machinery within 10 days from the date of work order, failing which it would be presumed that the successful tender is no interested in the work and action will be taken to get the work executed through alternate agency at the risk and cost of the former Tenderer.

2.18 Conditional tenders will not be accepted.

2.19 Bidders who meet the above specified minimum qualifying criteria, shallbe eligible.

2.20 Even though the Bidders meet the above criteria, they are subject to be disqualified if they have:

- Made misleading or false representations in the forms, statements and attachments submitted in proof of the qualification requirements; and/or

- Record of poor performance such as abandoning the works, not properly completed the contract, inordinate delays in completion, litigation history, or financial failures etc.

3. Site visit:

The Bidder at his own responsibility is encouraged to visit and examine the Site of Work sand its surroundings and obtain all information that may be necessary for preparing the Tender and entering into a contract for the Works. The cost of visiting the Site shall be at the Bidder's own expense.

B. Tender documents (Two bid system – Technical & Financial)

The Tender document can be downloaded from e-procurement website: https://eprocure.gov.in/eprocure/app

It may be noted that all subsequent notifications, changes and amendments on the project/document would be posted only on the same website:
https://eprocure.gov.in/eprocure/app

The bidders will be required to register themselves with the centre for e-governance to participate in the bidding .Necessary details could also be obtained over telephone at cppp.

4. Content of Tender documents

The bidders should go through the Tender Document and submit online response through e-procurement portal only.

5. Amendment of Tender documents

5.1 Before the deadline for submission of tenders, the IISC. may modify the tender documents by issuing corrigendum / addendum.

5.2 Such corrigendum/ addendum thus issued shall be part of the tender documents and shall be published online in e-Procurement portal.

5.3 To give prospective Bidders reasonable time in which to take corrigendum/ addendum into account in preparing their tenders, the IISC. shall extend as necessary the deadline for submission of tenders.

C. Preparation of Tenders

6. Documents comprising the Tender

6.1 The Technical Bid submitted by the Bidder shall contain the documents as follows:

(a) Earnest Money Deposit & Tender processing fee paid in any of the payment modes specified in e-Procurement platform.
(b) Qualification Information as per formats to comply the task created in the e-Procurement Portal under General Terms and Conditions and Technical parameters and Documents required from Bidder.

(c) Any other documents / materials required to be completed and submitted by Bidders in accordance with these instructions. The required documents shall be filled in without exception.

6.2 The financial bid submitted by the Bidder shall contain the documents as follows:

Priced Bill of Quantities; online through e-procurement portal, no hardcopy of commercials should be attached or disclosed.

7. Tender prices

7.1 The contract shall be for category of works / whole works based on the priced Bill of Quantities submitted by the Bidder.

7.2 The Bidder shall fill in rates for all items in each category of Works described in the Bill of Quantities. Items for which no rate or price is entered by the Bidder will not be paid for by the IISC. When executed and shall be deemed covered by the other rates and prices in the Bill of Quantities.

7.3 All prevailing duties, taxes, and other levies payable by the contractor under the contract, or for any other cause, shall be included in the rates, prices and total Tender Price submitted by the Bidder.

8. Tender validity

8.1 Tenders shall remain valid for a period not less than 180 days after the deadline date for tender submission. A tender valid for a shorter period shall be rejected by the IISC. as non-responsive.

8.2 In exceptional circumstances, prior to expiry of the original time limit, the IISC. May request that the Bidders may extend the period of validity for a specified

additional period. The request and the Bidders' responses shall be made in writing or by email. A Bidder may refuse the request without forfeiting his earnest money deposit. A Bidder agreeing to the request will not be required or permitted to modify his tender, but will be required to extend the validity of his earnest money deposit for a period of the extension, and in compliance with Clause 9 in all respects.

9. Earnest money deposit

9.1 Earnest Money Deposit/ Bid security

The Bidder shall furnish, as part of his tender, earnest money deposit (EMD) of Rs.1,59,000/-
The Bidder can pay the Earnest Money Deposit (EMD) in the e-Procurement portal using any of the following payment modes:

- Credit Card
- Direct Debit
- National Electronic Fund Transfer(NEFT)
- Over the Counter(OTC)

EMD amount will have to be submitted by the bidder taking into account the following conditions:

a. EMD will be accepted only in the form of electronic form and not through Demand Draft or Bank Guarantee and will be maintained in E-procurement Bank account until the finalization of the Tender.
b. The entire EMD amount for a particular tender has to be paid in a single transaction

9.2 The earnest money deposit of unsuccessful Bidders will be returned after awarding the contract to the successful bidder.

9.4 The earnest money deposit may be forfeited:

(a) If the Bidder withdraws the Tender after tender opening during the period of tender validity;

(b) If the Bidder fails within the specified time limit to
   (i) Sign the Agreement; or
   (ii) Furnish the required Security deposit

10. Format and signing of Tender

Bidder shall sign all the pages of the tender document as a token of acceptance of all the terms and conditions of the contract and uploaded in the e-Procurement portal.

D. Submission of Tenders

11. Tenders must be submitted on-line in the e-Procurement portal by the Bidder Before the notified date and time.

12. Deadline for submission of the Tenders

The Bidder shall submit a set of hard copies of all the documents in a sealed cover to IISC. required as a pre-qualification bid (Technical bid) which were uploaded through e-procurement portal. In the event of any discrepancy between them, the original uploaded document in e-procurement shall govern. The IISC. may extend the deadline for submission of tenders by issuing an amendment in accordance with Clause 5, in which case all rights and obligations of the IISC and the Bidders previously subject to the original deadline will then be subject to the new deadline.

13. Late Tenders

In e-procurement system, Bidder shall not be able to submit the bid after the bid submission time and date as the icon or the task in the e-procurement portal will not be available. IISc will not be liable (or) responsible for any delay due to unavailability of the portal and the Internet link.

14. Modification and Withdrawal of Tenders

14.1 Bidder has all the time to modify and correct or upload any relevant document in the portal till last date and time for Bid submission, as published in the e-procurement portal.

14.2 The Bidder may withdraw his tender before the notified last date and time of tender submission.

14.3 No Tender may be modified after the deadline for submission of Tenders.

14.4 Withdrawal or modification of a Tender between the deadline for submission of Tenders and the expiration of the original period of Tender validity specified in Clause 8.1 above or as extended pursuant to Clause

8.2 may result in the forfeiture of the earnest money deposit pursuant to Clause 9.

E- Tender opening and evaluation

15. Tender Opening:

15.1 The IISc will open all the Tenders received in the presence of the Bidders or their representatives who choose to attend on the specified date, time and place specified. In the event of the specified date of Tender opening being declared a holiday for the IISC. The Tenders will be opened at the appointed time and location on the next working day.

15.2 The IISC. Will evaluate and determine whether each tender meets the minimum qualification /eligibility criteria.

15.3 Bidder to submit all the Original Documents, which are submitted in e-procurement portal, to the IISC. for verification at the time of opening of Tender

15.4 The IISc record the Tender opening

16. Process to be confidential

16.1 Information relating to the examination, clarification, evaluation, and comparison of Tenders and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process until the award to the successful Bidder has been announced.

17 Clarification of Tenders

17.1 To assist in the examination, evaluation, the IISC. may, at his discretion, ask any Bidder for clarification of his Tender. The request for clarification and the response shall be in writing or by e-mail along with the section number, page

number and subject of clarification, but no change in the price or substance of the Tender shall be sought, offered, or permitted.

17.2 Subject to sub-clause 17.1, no Bidder shall contact the IISC. on any matter relating to its Tender from the time of the Tender opening to the time the contract is awarded. If the Bidder wishes to bring additional information to the notice of the IISC., he should do so in writing.

17.3 Any effort by the Bidder to influence the IISC. in the IISC.'s Tender evaluation, or contract award decisions may result in the rejection of the Bidders' Tender.

18. Examination of Tenders and determination of responsiveness

18.1 Prior to the detailed evaluation of Tenders, the IISC. will determine whether each Tender (a) meets the eligibility criteria defined in Clause 2; (b) has been properly signed; (c) is accompanied by the required earnest money deposit and; (d) is substantially responsive to the requirements of the Tender documents.

18.2 A substantially responsive Tender is one which conforms to all the terms, conditions, and specifications of the Tender documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality, or performance of the Works; (b) which limits in any substantial way, inconsistent with the Tender documents, the IISC.'s rights or the Bidder's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other Bidders presenting substantially responsive Tenders.

18.3 If a Tender is not substantially responsive, it will be rejected by the IISC. And may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation.

19. Correction of errors

19.1 Tenders determined to be substantially responsive will be checked by IISC. For any arithmetic errors. Errors will be corrected by the IISC. As follows:

(a) Where there is a discrepancy between the rates in figures and in words, the lower of the two will govern; and

(b) Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern.

19.2 The amount stated in the Tender will be adjusted by the IISC. in accordance with the above procedure for the correction of errors and, with the concurrence of the bidder, shall be considered as binding upon the bidder. If the bidder does not accept the corrected amount the Tender will be rejected, and the earnest money deposit may be forfeited.

20. Evaluation and comparison of Tenders

20.1 Opening of the financial bid will be preceded by the evaluation of the Pre-qualification Offer (Technical bid), vis-a-vis the capability, capacity and credibility of the Bidder. Evaluation of the Pre-qualification Offer will be done by the Evaluation Committee constituted for the purpose. After evaluation is completed, all the Bidders who are qualified will be notified

and will be intimated at the time of opening of the financial bid. Financial bid will be opened in the presence of those who choose to be present or even in the absence of any Bidder.

The IISC will evaluate and compare only the Tenders determined to be substantially responsive in accordance with Clause 18.

20.2 In evaluating the Tenders, the IISC. Will determine for each Tender the evaluated Tender Price by adjusting the Tender Price as follows:

(a) Making any correction for errors pursuant to Clause 19 and

(b) Making appropriate adjustments to reflect discounts or other price modifications offered in accordance with Sub Clause 14.5.

20.3 The IISC Reserves the right to accept or reject any variation, deviation, or alternative offer. Variations, deviations, and alternative offers and other factors which are in excess of the requirements of the Tender documents or otherwise result in unsolicited benefits for the IISC. Shall not be taken into account in Tender evaluation.

20.4 NEGOTIATIONS

The Bidder though technically qualified and who's financial offer is the lowest, fails to convince the Tender Evaluation Committee of his capability, capacity, credibility, his offer may be rejected and the Bidder intimated accordingly. In such case, the Bidder, who has quoted the second lowest price, may be considered and his price may be negotiated.

F. Award of Contract

21. Award criteria

21.1 Subject to Clause 22, the IISC. will award the Contract to the Bidder whose Tender has been determined to be substantially responsive to the Tender documents and who has offered the lowest evaluated Tender Price, provided that such Bidder has been determined to be (a) eligible in accordance with the provisions of Clause 2, and (b) qualified in accordance with the provisions of Clause 3.

22. IISC.'s right to accept any Tender and to reject any or all Tenders

22.1 Notwithstanding Clause 21, the IISC. reserves the right to accept or reject any Tender, and to cancel the Tender process and reject all Tenders, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the IISC.'s action.

23. Notification of award and signing of Agreement

23.1 The Bidder whose Tender has been accepted will be notified of the award by the IISC. Prior to expiration of the Tender validity period by e-mail or confirmed by letter. This letter (hereinafter and in the Conditions of Contract called the "Letter of Acceptance") will state the sum that the IISC. will pay the Contractor in consideration of the execution,

completion, and maintenance of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price").

23.2 The notification of award will constitute the formation of the Contract, subject only to the furnishing of a performance security in accordance with the provisions of Clause 24.

23.3 The Agreement will incorporate all agreements between the IISC. and the successful Bidder /Bidders. It will be kept ready for signature of the successful Bidder in the office of IISC. following the notification of award along with the Letter of intent. The successful Bidder will sign the Agreement and deliver it to the IISC.

23.4 Upon the furnishing by the successful Bidder of the Security deposit, the IISC. will issued formal work order

24. Further Security deposit (FSD)

24.1 5.5% on the running bills and final bill in addition to Earnest Money Deposit. When the FSD deducted from R.A Bills of the contractor @ 5.5% of the bill amount exceeds Rs.1.00 Lakh, the amount in excess of Rs. 1.00 Lakh may, at the request of the bidder, be released to him against the production of the bank guarantee issued from a Nationalized Bank only for an equal amount in the prescribed form. The bank guarantee should be valid till the completion of the period.

24.2 If the security deposit is provided by the successful bidder in the form of a Bank Guarantee, it shall be issued either by a Nationalized/Scheduled bank

24.3 Failure of the successful Bidder to comply with the requirements of Sub-Clause 24.1 shall constitute sufficient grounds for cancellation of the award and forfeiture of the earnest money deposit.

25. Corrupt or Fraudulent practices

25.1 The IISc requires that the Bidders observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, IISC.

(a) will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;

(b) Will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded IISc contract if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing a IISC contract.

SECTION 3: QUALIFICATION INFORMATION

The information to be filled in by the Bidder hereunder will be used for purposes of computing Tender capacity as provided in Clause 2 of the Instructions to Bidders. This information will not be incorporated in the Contract.

1.1	Name of Agency as registered	
	Postal Address for communication	
	Principal Place of business	
	Name of the Owner	
	Nature of Company/individual/partnership/firm etc	
	Name of the authorized person with contact details	
	Constitution or legal status of Bidder	
	Place of Registration	[Attach self-attested photo copy]

1.2 Total value of Building / Painting works executed and payments received in the last five years (Rs. Lakhs)

2014-15_____
2015-16_____
2016-17_____
2017-18_____
2018-19_____

1.3 (a) Details of Works performed as a Prime Contractor (in the same name) on works of similar nature over during the five years specified in 1.2 above.

Project Name	Name Of Employer	Description of work	Contract number	Value of Contract	Stipulated Period of completion	Actual date of completion	Remarks (Reason for delay)

[Attach satisfactory certificate and date of completion from the concerned Engineer-in-charge not below the rank of Executive Engineer or Competent Authority]

(b) Details of single Govt / Semi Government similar nature of works costing 53,00,000/- of the amount put to tender & above carried out during the five financial years specified in 1.2 above.

Project Name	Name Of Employer	Description of work	Contract number	Value of Contract	Date of work order	Stipulated Period of completion	Actual date of completion	Remarks (Reason For delay)

[Attach satisfactory certificate and date of completion from the concerned Engineer-in-charge not below the rank of Executive Engineer or Competent Authority]

1.4 Information on works for which Tenders have been submitted and works which are yet to be completed as on the date of this Tender.

(A) Existing commitments and on-going works:

Description of Work	Place & State	Contract Number & Date	Name & Address of the Customer	Value of Contract in Rs. Lakhs	Specified Period of Completion	Value of Remaining work to be completed	Anticipated Date of Completion
1	2	3	4	5	6	7	8

[Details to be furnished with necessary work order signed from concerned Engineer-in-charge not below the rank of Executive Engineer or Competent Authority. Work order/Testimonials will be verified, if required]

(B) Works for which Tenders already submitted:

Description of Work	Place & State	Name & Address of the Customer	Estimated Value of Work In Lakhs	Specified Period of Completion	Date when the decision expected	Remarks if any
1	2	3	4	5	6	7

1.5. Reports on the financial standing of the tendered, such as profit and loss statements and auditor's reports (audited balance sheet) and Annual Turn Over for the last five years to be uploaded as per the format below:-

Amount

Sl. No	Year	Turn Over	Remark
1	2014-15		
2	2015-16		
3	2016-17		
4	2017-18		
5	2018-19		

[Report on the financial standing of the tendered, such as profit and loss statements and auditor's report (Audited balance sheet)for the last five years to be uploaded]

1.6 Evidence of access to financial resources to meet the qualification requirement specified in ITT Clause3.3 (b): Cash in hand, Letter of Credit etc. List them below and attach certificate from the Banker in the suggested format as under:

BANKER'S CERTIFICATE

This is to certify that M/s. …….. is a reputed company with a good financial standing. If the contract for this work, namely …….. (Name of the work) is
K/W – 4 Works /Open awarded to the above firm, we shall be able to provide overdraft/credit facilities to the extent of Rs. ……. (30% of the Estimated value of work as in page 3, Item 2) to meet the working capital requirements for executing the above contract

Sd/-
Name of the Bank, Senior Bank Manger
Address:……

Name, address, and telephone, telex, and fax numbers of the Bidders' bankers who may provide references if contacted by the IISC.

Income tax clearance certificate to be uploaded duly signed by competent Authority

SECTION 4:

Form of Tender

Description of the Works: "Repairs Restoration works and Renovations to NFSS Lab in Mechanical Engineering Department, IISc"

To

The Registrar,
Centre for Campus Management and Development
Indian Institute of Science
Bangalore – 560 012

Dear Sir,

We offer to execute the Works described above in accordance with the Conditions of Contract

This Tender and your written acceptance of it shall constitute a binding contract between us. We understand that you are not bound to accept the lowest or any Tender you receive.

We undertake that, in competing, if the award is made to us, in executing the above contract, we will strictly observe the laws against fraud and corruption in force in India namely "Prevention of Corruption Act 1988".

We hereby confirm that this Tender complies with the Tender validity and Earnest money deposit required by the Tender documents.

We hereby authorized IISc and its authorized representatives to conduct any enquiries or investigations to verify the statements, documents and information submitted (uploaded) for this tender.

We attach herewith our current income-tax clearance certificate.

Yours faithfully,

Authorized Signature:

Name & Title of Signatory: _____

Name of Bidder
Address:

THE ARTICLES OF AGREEMENT

Articles of Agreement made at Bangalore, this …… Between the INDIAN INSTITUTE OF SCIENCE, BANGALORE 560 012, (here in after referred to as the OWNER or EMPLOYER which expression shall include its successors and assigns and all the persons for the time being in the Management of the Institute) represented by its REGISTRAR of the ONE PART, and ……here in after
Referred to as the "CONTRACTOR", (which expression shall include their partners, their respective heirs, executors, administrators and assigns) on the OTHER PART.

Whereas the Employer is desirous of getting the work of "Repairs Restoration Works and Renovations to NFSS Lab in Mechanical Engineering Department IISc"(hereinafter called the work) executed by the Contractor at the rates quoted by him amounting to Rs. 1,06,00,000/- (Rupees One Crore six Lakhs Only) which is the estimated
Amount put to tender.

And Whereas the Contractor has agreed to execute the aforesaid work on terms and conditions mentioned herein and subject to Tender Conditions of Contract and in accordance with the particular specifications, general notes and the schedule of quantities, schedule of rates, payment and penalty condition.

And Whereas the contractor has deposited a sum of Rs.1,59,000/- (Rupees One Lakhs Fifty Nine Thousand Only) with Employer as security for the due performance of this Contract.

NOW it is hereby agreed and declared by and between the parties hereto as follows;

1. In consideration of the payment to be made to them as hereinafter provided, the contractor shall, subject to the terms, conditions, specifications, schedule of quantities, drawings, etc., more particularly stated in the Schedules aforesaid, execute and complete the work within 5 (Five) Months starting after 10 days of issuance of work order or from the date of handing over of site, whichever is later.

2. The Employer shall pay to the contractor such sums as shall become payable hereunder at the time and in the manner specified in the conditions contained in the schedule aforesaid.

3. The time allowed for carrying out the work as entered in the tender Agreement 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 10 days after the date on which the order to commence the work is issued to the Contractor or the date of handing over of site, whichever is later. The work shall throughout the stipulated period of the contract be proceeded with all due diligence and the Contractor shall pay as compensation an amount equal to one percent, or such smaller amount, as the Director, Indian Institute of Science (whose decision in writing shall be final) may decide on the amount of estimated cost of the whole work as shown in the tender for every day that the work remains un commenced or unfinished, after proper dates.

4. The contractor shall to ensure good progress during the execution of the work the contractor shall be bound in all cases in which the time allowed for any work exceeds one month (save for special jobs) to complete one-eighth of the whole work before, one-fourth of the whole time allowed under the contract has elapsed, three-eighths, of the work before one-half of such time has elapsed, and three-fourths of the work before three-fourths of such time has elapsed.

However for special jobs if a time schedule has been submitted by the contractor and the same has been accepted by the Architects/ Project Engineer-cum-Estate Officer, CCMD the contractor shall comply with the said schedule. In the event of the Contractor failing to comply with the conditions he shall be liable to pay as compensation an amount equal to one percent or such smallest amount, as the Director, Indian Institute of Science (Whose decision in writing shall be final), may decide on the said estimated cost of the whole work for every day that the due quantity of work remains incomplete; provided always that the entire amount of compensation to be paid under the provisions of this clause shall not exceed seven and a half (7 ½) percent of the estimated cost of the work as shown in the tender.

5. The Director of the Indian Institute of Science, without prejudice to his rights under the contract in any respect of any delay or inferior workmanship or otherwise, or to any claim for damages in respect of any breaches of the Contract and without prejudice to any rights of remedies under any of the 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 Architects/Project Engineer-cum-Estate Officer, CCMD a notice in writing to rectify reconstruct or replace any defective work or that the work is being performed in any inefficient or otherwise improper or un workmanlike manner, shall omit to comply with the requirements of such notice for a period of seven days of such notice thereafter or if the contractor shall delay or suspend the execution of the work so that in the judgment of the Project Engineer-cum-Estate Officer, CCMD (which shall be final and binding) either he will be unable to secure completion of the work by the date for completion of the work or he has already failed to complete the work by that date.

(ii) If the Contractor being a company passes a resolution or if the Court passes an order to wind up the company or if a receiver or a manager is appointed on behalf of the creditors of the company or under circumstances which entitles the Court or the creditors to appoint a receiver or manager which would entitle the Court to make a winding up order.

(iii) If the Contractor commits breach of any of the terms or conditions of this contract;

(iv) If the contractor assigns or sublets without written approval of the Project Engineer-cum-Estate Officer, CCMD or becomes insolvent.

When the Contractor has made himself liable for action under any of the cases aforesaid, the Project Engineer-cum-Estate Officer, CCMD on behalf of the Director of the Institute shall have powers:

(a) To determine or rescind the Contract as aforesaid (in which termination or recession notice in writing to the Contractor under hand of the Project Engineer-cum-Estate Officer, CCMD shall be conclusive evidence) Upon such determination or recession the security deposit of the Contractor shall be liable to be forfeited and shall absolutely be at the disposal of Institute.

(b) To employ labor paid by the Institute and supply materials to carry out the work or any part of the debiting the Contractor with the cost of the labor and the price of the materials (of the amount of which cost and price certified by the Project Engineer-cum-Estate Officer, CCMD shall be final and conclusive against the Contractor) and crediting him with the value of the work done in all respect on the same manner and at the same rates as if it has been carried out by the contractor under the term of his contract. The certificate of the Project Engineer-cum-Estate Officer, CCMD as to the

value of the work done shall be final and conclusive against the contractor, provided always that action under the sub-section shall only be taken after giving notice in writing to the contractor. Provided also that if the expenses incurred by the Institute are less than the amount payable to the contractor at his agreement rates, the difference shall not be paid to the Contractor.

(c) After giving notice to the contractor to measure up the work of the contractor and to take such part thereof as shall be un-executed out of his hands and to give it to another contractor to complete in which case any expenses which may be incurred in excess a sum of which would have been paid to the original contractor if the whole work had been executed by him (of the amount of which excess the certificate in writing of the Project
Engineer-cum-Estate Officer, CCMD shall be final and conclusive) shall be borne and paid by the original contractor and may be deducted from any monies due to him from the Institute under this contract or any other account whatsoever, of from his security deposit or the proceeds of sales thereof, or a sufficient part thereof as the case may be.

In the event of any one or more of the above courses being adopted by the Project Engineer-cum-Estate Officer, CCMD, 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 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 provisions, aforesaid, this contractor shall not be entitled for recover or be paid any sum for work thereto/for actually performed under this contract unless the Architect/ Project Engineer- cum- Estate Officer, CCMD 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.

6. The schedules above mentioned including the General Rules and Directions to Contractors and the following documents, viz.,
   - i) Letter of Intent
   - ii) Letter of Acceptance
   - iii) Conditions of Contract – Volume I
   - iv) Contractor's Bid – Bill of Quantities – Volume II
   - v) Technical Specifications – Volume III
   - vi) Drawings
   - vii) The pre-Bid meeting proceedings and corrigendum
   - viii) Any other document listed in the Contract Data as forming part of the contract

   shall form an integral part of agreement and the decision of the Project Engineer-cum-Estate Officer, CCMD in reference to all matters of dispute as to material and workmanship shall be final and binding on both the parties.

7. The employer reserves to himself the right of altering the drawings of the works and of adding to or omitting any item of work from or of having portions of the same carried out departmentally or otherwise and such alterations or variations shall not vitiate this agreement.

8. This agreement comprises the work aforesaid and all subsidiary works connected therewith even though such works may not be shown on the schedule appended hereto.

9. Notwithstanding anything contained in the tender submitted by the contractor, all the clauses of this agreement shall be binding on both the parties.

10. Where counter terms and conditions, printed or copied, are offered by the contractor, the same shall not be deemed to have been accepted by the Employer, unless specific written acceptance thereof is furnished by the Employer. Notwithstanding the foregoing, no verbal agreement or inference from conversation with any office members/representatives/employees of the Employer before, during or after the execution of the agreement, shall in any way affect or modify any of the terms/obligations contained herein.

11. In the event the contract is terminated by the Employer due to any aforementioned act/omission on the part of the contractor, or for any reason whatsoever, the Employer shall be entitled to engage the services of any other person, agency or Contractor to meet its requirement, without prejudice to its rights including claim for damages against the Contractor.

12. The Employer shall be indemnified for all losses due to commissions and Commissions of persons deployed by the contractor. If any loss or damage is caused to the Employer on account of any negligence, carelessness, acts of Commissions. Commissions of contractors, his employees or staff, the same shall be made good by the contractor. The contractor shall defend, indemnify and hold the Institute harmless from any liability or damage, law suits, penalties imposed by any State of Central Government Department or statutory body or by a third party for reasons of violation of any of statutory provisions or requirements by the contractor. The Employer shall not be liable for any damage or compensation payable to any workmen or to any person as a consequence of this work and the Employer shall be completely indemnified accordingly.

13. In case of disputes s including all questions relating to the performance of the obligations under this agreement and all the dispute and differences which shall arise either during or after the agreement period or other matters arising out of or relating to this agreement or payments to be made in pursuance thereof shall be decided by the Director of IISc whose decision shall be binding on the contractor. The Contractor hereby agrees to be bound by the decision of the Director

IN WITNESS WHERE OF the parties here to have set their respective hands the day and the year here in above written.

In the presence of: Signed by for and on behalf of the said

Contractor.

In the presence of: Signed by for and on behalf of the said

Employer.

REGISTRAR
INDIAN INSTITUTE OF SCIENCE
BANGALORE-12

INDIAN INSTITUTE OF SCIENCE, BANGALORE-12

ITEM RATE TENDER FOR WORK

I/We, hereby tender for the execution for the Indian Institute of Science, Bangalore-12 of the works specified in the under mentioned memorandum within the time specified in such memorandum at the rates specified therein and in accordance, in all respects, with the specifications, designs, drawings and instructions in writing which have been read by me/read and explained to me and with such materials as provided for by and in all other respects in accordance with such conditions as for as possible.

MEMORANDUM OF WORK

GENERAL DESCRIPTION	"Repairs Restoration works and Renovation to NFSS Lab in Mechanical Engineering Department, IISc"
ESTIMATED COST	Rs 1,06,00,000/-
EARNEST MONEY	Rs. 1,59,000/-
FURTHERSECURITY DEPOSIT	5.5% on the running account bills and final bill in addition to Earnest Money Deposit. When the F.S.D. deducted from the RA bills of the Contractor @ 5.5% of the bill amount exceeds Rs.1.00 lakhs, the amount in excess of Rs.1.00 lakh may, at the request of the Contractor, be released to him against the production of a bank guarantee issued by a Nationalized Bank only for an equal amount in the prescribed form. The bank guarantee should be valid till the completion of the period mentioned in page 3 (period of work completion)
TIME ALOWED FOR THE COMPLETION OF WORK IN ALL RESPECTS FROM THE COMMENCEMENT WORK	6(Six) Months
BILLS OF QUANTITIES	Enclosed
SPECIFICATIONS	The work shall be carried out strictly in accordance with the enclosed specifications and wherever items are not covered by those specifications in accordance with specifications/Drawings/Designs/Requirement and direction of the Project Engineer –Cum-Estate Officer ,CCMD or his representatives.

I/We hereby agree to abide by and fulfill all the terms and provisions of the conditions contained in the articles of agreement, which have been read by me/us or in default thereof to forfeit and pay to the Registrar, Indian Institute of Science or his successors he sums of monies mentioned in the said conditions.

The sum of Rs.1,59,000 /- (Rupees One Lakhs Fifty Nine Thousand Only) has been deposited in cash/Bank draft as Earnest Money the full value which is to be absolutely forfeited to the Registrar or his successors in Office should I/We fail to commence the work specified in the above memorandum and complete the same.

Dated this .....

Signature of the Contractor/s

Witness to Contractor/s Signature:

NAME

ADDRESS

OCCUPATION

The above tender is hereby accepted by me on behalf of the Indian Institute of Science, Bangalore-12.

REGISTRAR
INDIANINSTITUTE OF SICENCE
BANGALORE.

Indian Institute of Science, Bangalore-12

APPENDIX

1.Name of the work	"Repairs Restoration works and Renovation to NFSS Lab in Mechanical Engineering Department, IISc"
2.Date of commencement of work	Within Ten days from the date of issue of work order or the date of handing over the site whichever is later
3.Time of Completion	6(Six) Months
4.Frequency of interim Certificate and payment	Once every month.
5.Further Security deposit	5.5% on the running bills and final bill in addition to earnest money deposit. When the F.S.D. deducted from the R.A. Bills of the contractor@ 5.5% of the bill amount exceeds Rs.1.00 Lakhs, the amount in excess of Ra.1.00 Lakh may, at the request of the contractor, be released to him against the production of bank guarantee issued from a Nationalized Bank only for an equal amount in the prescribed form. The bank guarantee should be valid till the completion of the period i.e., 90 days.
6.Defects liability period / retention amount from the final bill/release of balance of deposit	The security deposit lodged/paid by a contractor shall be refunded to him after the final bill is paid or after twelve months from the date of completion of the work, during which period the work so executed should be maintained by the contractor in good order, whichever is later
7.Penalty for delay	In respect of the shortfall in progress, assessed as due to the delay on the part of contractor as per clause 2(b) and 2(c), the contractor shall be liable to pay as penalty an amount equal to one percent of the estimated cost of the balance work assessed according to the programme, for every day that the due quantity of work remains incomplete, provided always that the total amount of penalty to be paid

	under the provisions of this clause shall not exceed 7 ½ percent of the estimated cost of the entire work as shown in the tender, provided further that in the event of the contractor making up the shortfall in progress within the stipulated or extended time of completion, the penalty so recovered may be refunded on an application in writing by the contractor.
8. Period for payment of Running Bill.	Three weeks from the date of submission of each Running account bills by the Contractor.
9. Period for submitting the final Bill.	One month from the date of virtual completion of the work by the Contractor.

GENERAL RULES AND DIRECTIONS TO CONTRACTORS

1. A Schedule of Quantities (Bill of Quantities) is attached herewith. It should however, be clearly understood that these quantities are liable to alterations by omission, addition or variation, at the discretion of the Architects/Project Engineer Cum Estate Officer..

2. The tenderer shall insert all rates and amounts and the totals in the schedule of quantities. Rate for alternative items, when asked for, shall be entered in red ink and shall not be included in the total.

3. The drawings together with specifications and conditions of contract are enclosed. These should be studied carefully by the intending tenderers. In the absence of specifications for any item of work, material or ingredient in the specifications, PWD specifications shall be followed and in the absence of specification for any item, materials are ingredient shall be fixed in all respects in accordance with the instructions and requirements of the Project Engineer Cum Estate Officer, the work will be the best of the kind.

4. The tenderer is expected to inspect the site and acquaint himself with the local conditions and will be deemed to have so done before submitting the tender.

5. The successful tenderer is required to sign an agreement for the due fulfillment of the contract and start the work immediately on of the acceptance of his tender. A draft of the Articles of the Agreement is enclosed. The Earnest Money referred to in item No.3 of Memorandum contained in the "Item Rate Tender for Works", will be forfeited and at the absolute disposal of the Employer if the Contractor defaults from signing the Agreement of in starting the work.

6. The rates quoted shall be for finished work and shall include for all necessary incidental work. Sales or any other tax on materials in respect of this contract will be payable by the Contractor. The Contractors cannot presume any details regarding the contract.

7. Water supply: The Contractor has to make his own arrangement for water supply. However,, if water supply to the site at one convenient point is made available by the Institute, the charges for the consumption of water will be borne by the Contractor at 1.50% of the value of the work.

8. Supply of Electricity-electricity required for construction shall be arranged by the contractor itself. Electricity if supplied to the contractor

9. by the institute will be metered and amounted will be recovered in the bills as per actual at rate fixed by the Institute. Supply of electricity from

10. the institute is not mandatory. Non supply of electricity by the institute cannot be held as reason for short fall in progress.

11. The duration of the work is 5 (Five) Months.

12. Institute reserves the right to accept or reject any tender without assigning reasons thereof. He further reserves the right of deleting any item of work in this contract at his discretion.

13. The tenders are valid for a period of 3 (three) months from the date of opening.

14. This "General Rules and Directions to Contractors" shall also form part of the tender document

14.1 Cement to be procured by contractor only, adhering to the following conditions.

1. Only 53 grade OPC cement is to be used for the projects.
2. The cement shall conform to IS 8119-1976.
3. ACC, L&T, Coromandel, Birla brands only to be used.
4. Test certificate is to be produced for every procurement made for.

15.This contract comprises:

a) General Builders work (Civil works).

b)Water supply and Sanitary

Installation

c) Electrical Installation.

d) Sump and overhead tank.

13. The General Builder should get the water supply and sanitary installations and the Electrical installations executed through licensed sub-contractor having good experience and qualified and competent tradesmen in the respective fields and approved by the Project Engineer Cum Estate Officer.

14. It is entirely the responsibility of the Contractor to arrange for and provide all materials required for successful completion of the work except such special materials that may be supplied if any.

15. The Brand, size and colour of vitrified/ceramic/glazed tiles shall be got approved from the Competent authority before procurement of materials. Brands recommended are Johnson, Naveen, Kazaria

16. Water supply/Sanitary fixtures like Bib cocks, pillar cocks, Health-faucet angle cock, bottle traps, EWC, IWC, urinal basins shall be as per approval from competent authority

18. Tenders determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors will be corrected by the Employer as follows

    a) Where there is discrepancy between the rates in figures and in words, the lower of the two will be governed and
    b) Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will be governed.
    c) Where there is a discrepancy in entries of unit rate between the Original and Duplicate, the lower will govern.

19. Tol tax, Octrai, Royalty for collecting earth, gravel, sand stone etc., Excise duty, GST, Sales tax or any other tax payable on account of this contract will have to be met from contractors account.

20. The Contractor should make his own arrangements to cover the all-round construction area, by providing polyester net/polythene sheet/barricading to avoid inconvenience to other surrounding departments, as directed by the Engineer-in-charge of the work.

21. The debris arise during the period of construction will have to be cleared then and there to keep the surroundings clean and tidy. Such debris shall, if not cleared, be cleared at his risk and cost.

22. Work done as a sub- contractor under a prime contractor will not be considered for qualification.

23. “Prime Contractor” means a firm that performs a construction work itself and that the work is directly entrusted to the firm by the owner/ government/ local body/ quasi government/ Government undertaking bodies.

24. The contractor shall vacate the campus premises with all his men/ materials immediately after completion of the project

GENERAL SPECIFICATIONS

PART -1 Specifications for Civil Works

1.0 EXCAVATION

1.1 The places where excavation is directed to be done shall be cleared of all shrubs, weeds, grass and vegetation including roots, where necessary and if so directed, the excavated earth must be deposited in layers of 15 cms and the clods broken. During excavations, if so directed, 'dead-man' (of volume not more 5% of the excavation volume shall be left at the places directed for verification of the dimensions of excavation). These 'dead-man' shall be removed and earth deposited at places shown before full rate is paid, Alternatively or in addition to 'dead-man', block level at intervals as directed will be jointly taken and recorded by the contractors representative and employer's representative before starting of excavation and after completion. Recording of – block levels or leaving of 'dead-man' may be avoided in the case of narrow foundations and trenches, if so directed.

1.2 The rate quoted shall include bailing or otherwise removing all water which may accumulate in the excavation from all causes and removing of swish, trimming of all sides plumb or otherwise as directed, dismantling removing and stacking as directed any existing water pipes and or soil pipes etc., encountered within the excavation.

2.0 CONCRETE WORKS

2.1 Proportion of ordinary cement concrete will be expressed as 1:4:8, 1:3:6, 1:2:4 etc., The first figure will be quantity of ordinary Portland cement by volume, the second figure will be dry coarse sand (fine aggregate) by volume and the third figure will be the quantity of coarse aggregate by volume. Cement shall be measured by weight. The weight is to be derived on the basis that one cubic meter will weigh 1440 kg or one full bag of 50kg will be assumed to be 35 lts. When the sand is wet or moist suitable corrections for bulking is to be given while proportioning. The clerk of works may allow measuring cement by volume.

2.2 Unless otherwise specified, the rates for all RCC will be exclusive of reinforcements but including from work, Reinforcements will be measured and paid separately.

2.2.1 Unless otherwise stated for all RCC work the size of coarse aggregate will be 20MM and down size.

2.2.2 Concrete proposed for roof slab and roof beams is ready mixed concrete. The contractor should quote, his rate keeping in view that the rate should include for ready mixed concrete all as per specifications and directions of Engineer-in-charge.

2.3 READY MIXED CONCRETE (RMC) IS: 4926-1976

a. The RMC from suppliers of ACC/L & T/Fletcher challenge should only be used.

b. The rates are inclusive of all lead and lift. Additional lead and lift charges.

c. The rate is inclusive of all necessary form work, centering and scaffolding capable of withstanding pumping of concrete.

d. The rates are applicable to the materials with a maximum radius of 25 km from the city center.

e. Test results of concrete for 28 days strength be obtained from the concerned RMC supplying firm

2.4 MATERIALS.

2.4.1 Cement:-

2.4.1.1 Cement shall comply in every respect with the requirements of the latest publication of IS: 269 and unless otherwise specified, ordinary Portland cement shall be used. No other make of cement but that approved by the Architects/ Employers will be allowed on works and the source of supply shall not be changed without approval of the Architects/Employer in writing test certificates to show that the cement used fully complies with the relevant IS specifications shall be submitted to the Architects/ Employer and not withstanding this the architects may at their discretion order that the cement brought to site and which they may consider damaged or of doubtful quality for any reasons whatsoever shall be rested in an approved testing laboratory and fresh certificate of its soundness shall be produced, Cement ordered for retesting shall not be for any work pending results of retest.

2.4.1.2 Cement shall be stored neatly packed in piles not exceeding 10 bags high in weather-proof sheds with raised wooden plank flooring to prevent deterioration by dampness or intrusion of foreign matter. It shall be stored in such a way as to allow the removal and use of cement in chronological order of receipt, i.e., the first received being first used. Cement deteriorated and/or clotted shall not be used on work but shall be removed at once from the site daily record of cement received and consumed shall be maintained by the contractor in an approved from and a copy submitted to the employer once a month.

2.4.2 Fine Aggregates:

2.4.2.1 Sand shall conform to IS: 383 it shall pass through IS sieve 4.75mm (3/ from a 16" B S) test sieve, leaving a residue not more than 5%. It shall be from a natural source or crushed stone screedings it shall we washed, if directed, to reduce the percentage of deleterious substances to acceptable-limits. Sand
shall not contain any trace of salt and sand containing any trace of salt shall be rejected.

2.4.2.2 The fine aggregate for concrete shall be graded within limits as specified in IS: 383 and the fineness modules shall range between 2.60 to 3.20 the fine aggregates shall be stacked. Carefully, on a clear hard dry surface so that will not get mixed up with deleterious foreign materials. If such a surface is not available, a platform of planks or corrugated sheets or brick floor or concrete floor shall be prepared. Sand shall be added in the desired proportion as required for the strength specified, with suitable correction for "bulking".

2.4.2.3 Coarse aggregates: Coarse aggregate shall conform to IS:383. It shall consist of crushed or broken stone, 95% of which shall be retained on 4.75 mm IS test sieve. It shall be obtained from crushed granite, trap, basalt or similar approved stones from approved quarry. Coarse aggregate shall be chemically inert when mixed with cement and shall be angular in shape and free from soft friable thin porous laminated or flaky pieces. It shall be free dust and other foreign matter. – Gravel/shingle of desired grading may be permitted as a substitute in part or full in plain cement concrete if the Architect/Employer is otherwise satisfied about the quality of aggregate.

2.5 MIXING OF CONCRETE:

2.5.1 Machine mixing:- Aggregates shall be accurately measured out in boxes and mixed dry along with required cement. Water shall then be added in measured quantity and mixing shall be continued until there is uniform distribution of the materials and the mass is uniform in colour and consistency but in no case shall the mixing be done less than two minutes. Only hopper loading mixer shall be used.

2.5.2 Hand mixing: when hand mixing is permitted with the approval of the Project-Engineer – Cum – Estate Officer, CCMD, it shall be carried out in water tight, mixing platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. If required by, the architect/consultant 10% extra cement has to be used at the contractor's cost if hand mixing is done.

2.5.3 Consistency:

2.5.3.1 Only sufficient water giving due allowance for the moisture content of aggregate shall be added to the cement and aggregate during mixing to produce a mixture of sufficient workability to enable it to be well consolidated to be worked in to corners of the shuttering and around the reinforcements (where there is reinforcements) to give the specified finish and to have the specified strength.

2.5.3.2 Normally for every 50 kg of cement in the concrete in the mix, total water including moisture content of aggregate should not be more than 34 lts for 1:3:6 mix, 32 lts for 1:2:4 mix 30 lts for 1:1 ½ :3 and 27 ltrs for 1:1:2 mix

2.5.3.3 If difficulty be experienced in placing concrete of specified mix and approved consistency between and below reinforcement bars, in the bottom of beams and similar situations, the concrete shall have improved workability by increasing the proportion of water with corresponding additional quantity of cement using aggregates of smaller size than specified as directed by the Architect/ Employer for which extra will be paid.

2.5.3.4 The consistency shall be determined by making trail mixtures with dried aggregates, or. When so instructed by test laboratory made test cubes under the direction of Architect/ Employer by slump – Test using a standard cone or the Architect/Employer may direct the use of any other means of testing the consistency.

2.5.3.5 If the apparatus used for the slump test is a standard cone, the cone when filled, shall be raised vertically – clear of the concrete: The 'slump' shall be 300mm minus the height of the slumped cone of concrete. Care shall be taken to prevent vibration of the samples being tested. The following slumps shall be adopted for different kinds of works:

		With Vibrator	Without Vibrator
A	Mass concrete in RCC foundations, footings and retaining walls	10 to 25mm	80 mm
B	RCC beam, slabs and columns	25 to 40 mm	100 to 125 mm
C	Thin RCC section or section with congested steel	40 to 50mm	125 to 150mm

2.5.4 Placing and Compacting

2.5.4.1 Method of placing concrete shall be such as to preclude segregation and as far as practicable the placing shall be continues.

2.5.4.2 Special care shall be taken in accordance with 18:456 while laying concrete under extreme weather. Concrete, during the operation of placing shall be thoroughly worked around the reinforcements, embedded fixtures, spaded against comers of the form work by punning, rodding or by any other approved means and thoroughly compacted by mechanical vibrators. The number and type of vibrator to be used, and in general immersion type vibrators shall be used.

2.5.4.3 Consolidation by using immersion vibrator will be in accordance with Is: 3558 sufficient number of reserve vibrators in good working condition shall be kept on hand at all times, so as to ensure that there is no slacking or interruption in compacting.

2.6 ADMIXTURE

The use of admixtures may be allowed only if approved b the Architect/Consultant their decision in this regard shall be final.

2.7 TRANSPORTING

Concrete shall be conveyed from the place of mixing to the place of final deposit as rapidly as practicable by methods which will prevent segregation of loss of any of ingredients? If segregation does occur during transport the concrete shall be remixed before being placed, normally not more than 30 minutes shall lapse between mixing and consolidation in position.

2.8 CURING:

All cement concrete after laying shall be protected from damages, till it sets and shall be cured thereafter for not less than ten days. The work shall be protected from direct wind and direct sun, rays. Water used for curing shall be free from sediments of any kind and generally fit for drinking.

2.9 STRENGTH OF ORDINARY CONCRETE:

2.9.1 The Contractor has to ensure that proper- materials in specified proportion are used and the correct water cement ratio, just sufficient for the workability is maintained to see that the minimum strength of concrete as provided under paragraph 3.9.2 (below) are obtained. To verify this, test cubes from the concrete pours should be made and tested. The frequency of testing and the acceptability criteria will be according to IS: 456.

2.9.2 Compressive strength of 15 cm cubes at 28 days after mixing shall be as follows: same as Para 3.13.2

2.9.3 Six pubes shall be taken from any mix selected at random as directed by Engineer-in-charge three of these should be tested after 7 days and three after 28 days. The strength at 7 days must be 2/3 of the strength at 28 days. The criteria for acceptance are only the strength at 28 days.

2.10 FORMWORK AND CENTERING

2.10.1 The form: work shall conform to the shape, lines and dimensions of the faces of concrete shown on the drawings and be so constructed as to remain sufficiently rigid the placing and compacting of the concrete and shall be sufficiently water tight to prevent loss of cement slurry from the concrete.

Form work shall be constructed of steel or timber or marine plywood and adequately designed to support the full weight of wet concrete (deflection limited to 3mm) and retain its form during laying, consolidation arid setting of concrete. Timber used shall be properly seasoned so as to prevent deformation when wetted.

2.10.2 Props shall be straight and of full height and no joints shall be allowed props be braced bamboo's or wooden battens or other means in both directions at I intervals of 1500mm and where additional staging is necessary, extra care shall be taken to use bigger size props with bracing at necessary levels. All the props shall be supported on sole plates double wedged. At the time of removing props these wedges be gently eased and not knocked out.

2.10.3 All rubbish, chipping, shavings, sawdust etc., shall be removed from the interior of the forms before concrete is placed. The form work in contact with the concrete shall be cleaned and thoroughly wetted and treared with non staining mineral oil or any other approved material. Care shall be taken that " oil or such similar material is kept out of contact with the reinforcement.

2.10.4 Officer, GGMD at convenient places for washing down all the rubbish. These are to be closed before concreting.

2.10.5 All form work shall be removed without shock or vibration and shall be eased off carefully in order to allow the structure to take up its load gradually. Forms shall not be disturbed until concrete had adequately hardened to take up its own weight and superimposed load coming on it and in no circumstances shall forms be struck until the concrete reaches its strength of at least twice the stress to which the concrete may be subjected to at the time of striking. The said forms shall be so fixed that while removing them the supporting forms and props are not disturbed.

2.10.6 In the case of folded plates and shell roofs the contractor should take prior approval of the pattern of centering and shuttering along with programme for deshuttering.

2.10.7 The tolerance of shuttering and stripping time will be as set forth in IS : 456 if directed, forms shall be given an upward camber to ensure that the beams do not have any sa. No honey combing will be permitted, however any honey combing of minor nature as specifically allowed by the clerks of works shall be repaired neatly be with cement mortar 1:2

2.10.8 Any work showing signs of damage through premature or careless removal of centering or shuttering, shall be reconstructed by the contractor at his own cost. Surface that has to remain exposed after removal of forms shall be carefully examined and any fins, burrs, projections etc., that are detected shall be removed

2.10.9 Centering and shuttering is specified to be paid for separately, measurement of such centering and shuttering will be taken according to IS: 1200

2.11 Steel Reinforcement

2.11.1 Reinforcement for all works shall be TMT steel bars, as specified in the drawings. TMT steel bars shall be of tested quality conforming to grade I of
IS : 432 and high yield strength (of 550 N/sqmm) TMT bars shall be of IS:1786 or 1139 as appropriate. Reinforcement where called for shall be kept
clean and free from pitting, loose rust millseale- oil, grease- earth paint or any material which may impair the bond between concrete and reinforcement or which may cause high corrosion of the reinforcement or deterioration of the concrete.

2.11.2 Reinforcement shall be accurately done to the dimensions, spacing and minimum cover as per structural drawings. The contractor shall submit to the clerk of work bar bending schedules, prior to the commencement of fabrication. All joints in TMT reinforcement up to and including 16mm dia shall be overlapped. The length of overlap for tension and compression joints in TMT steel reinforcement above 16mm dia may be welded subject to the approval of the project Engineer- cum estate officer.

2.11.3 Wherever specified and / or approved, welded laps shall be provided subject to the following.

2.11.3.1 Random samples of typical – welded joints shall be made and got tested in an approved laboratory at the contractor's expenses.

2.11.3.2 If the cold twisted deformed bar has an untwisted end at lapping joint, such portion – shall be cut off prior to welding.

2.11.3.3 bars shall be free from rust at the joints to be welded.

2.11.3.4Bars can be aligned and kept in proper axis in order to minimize crookedness in bar welding.

2.11.3.5Nothing extra shall be payable towards lap welding of joint unless specifically mentioned or agreed otherwise.

2.11.4 Reinforcement shall be rigidly held in place inside the form work using chairs (bent from steel bars) spacer bars and cement concrete blocks each block shall be secured to the reinforcement with wire or clip embedded in the center of block so that it shall not be in contact with form work. Interactions of reinforcement shall be bound together with 18 gauge annealed soft iron binding wire.

2.11.5 Before proceeding to place reinforcements the contractor shall ensure that appropriate cover between the bars and or the form work is available. Should any difficult arise during the placing of steel in obtaining the required cover the contractor shall immediately draw the attention of the architect/consultant to the difficulty and shall carryout such corrective measures as the architect/ consultant may instruct.

2.11.6 Reinforcement left projecting from newly placed concrete shall be supported in a way there is no risk of disturbance, which would cause damage to newly placed concrete.

2.11.7 The contractor shall ensure that movement of men and material subsequent to fixing in position of the reinforcement is organized such that displacement of the reinforcement will not occur.

2.11.8 The measurements recorded for reinforcements shall be including all laps and wastages as approved by the project Engineer- cum Estate officer's representative.

2.12 INSERTS IN CONCRETE

The contractor shall fix all necessary inserts such as steel – plates, pipes, sleeves, bolts etc., and shall make provisions in the form work for holes, pockets dowels, etc., at no extra cost (unless otherwise specified) to enable, subsequent fixing of supports, brackets or similar items. He shall also ensure that all conduits, inserts etc., are in position before placing concrete.

2.13 CONTROLLED CONCRETE

2.13.1 Controlled concrete shall be taken to mean that there shall be full field control of(a) predetermined grading of all aggregates that go into concrete and (b) Predetermined proportion of coarse aggregate, fine aggregate, cement and water for the required strength.

2.13.2 Strength shall mean the acceptable field strength after 28 days of curing on the tests conducted on 15 cm cubes from concrete taken during concreting in the manner set if forth in IS 456. A statement to acceptable minimum field strength is noted below.

Compressive Strength		
Grade	Preliminary test (Kg/ Sq Cm)	Work Test (Kg/Sq Cm)
M10	135	100
M15	200	150
M20	260	200
M25	320	250
M30	380	300
M35	440	350
M40	500	400

2.13.3 Arrive at the proportion to be adopted to obtain the grade of concrete, the mix should be based on laboratory tests conducted using the aggregate actually available at site which would be used for making/ concrete. The design mix should give suitable workability to enable it to be well consolidated to be worked into the corners of the shuttering and around the reinforcement.

2.13.4 Where difficulty is likely to be encountered in placing and compacting concrete and where there is crowding of reinforcements a separate mix is to be designed for required strength and used without extra cost, the mix design along with the workability obtainable with the designed mix should be furnished to the architect/employer beforehand approval obtained. A laboratory is to be established at site to assess the moisture content of aggregate as frequently as necessary and as instructed by the Architect/employer based on which corrections is to be applied to the quantity of water to be used for mixing.

2.13.5 All aggregates are to confirm strictly to IS: 383. The aggregates will be tested as frequently as directed by the Architect/Employer to see that their specifications is the same as adopted in the mix design they must be stored on clean plat form made for the purpose.

2.13.6 Concrete shall be weigh batched, Dials of weigh batching unit to be used shall be checked with standard weights periodically. The conversions of weights volume will be allowed by Project Engineer cum Estate Officer, under special circumstances. Despite the design for several, mixes the following quantities of cement are the minimum to be used per cubic meter of the different grades of concrete.

Sl No	Grade of Concrete	Cement/ Cum (Bags)
1	M5	3.20
2	M7.5	3.60
3	M10	4.40
4	M15	4.80
5	M20	6.40
6	M25	6.80
7	M30	7.20

3.0 SIZE STONE MASONRY

3.1 Size stone shall be hard granite, basalt or trap stone obtainable from approved quarry, the stones shall be clean and wetted before they are used

3.2 Height of each course shall not be less than 15cm and all courses shall be of uniform height.

3.3 No face stone shall be less in depth than in height or shall tail into the work to a length less than the height stone shall break joints at least half the height of course faces of stones shall be hammers dressed such that the buildings are not more than 25mm thickness of joints shall not be more than 20mm. Edges of face stones of exposed faces shall be chiseled true to both longitudinal and vertical lines exposed faces of corner stones are to be two lines dressed 50mm wide.

3.4 Bond or through stones shall be provided not exceeding 2.0m apart in each course and shall be staggered bond stone shall be from the front to back of the walls fro walls up to 60cms thick; they shall either be in one piece (if available locally) or be in the series of headers; each header overlapping the adjoining one by not less than 150mm bond or through stones shall be marked as directed to enable easy detection even after having been built in position. The interior (or filling) shall be with flat bedded stones laid in mortar joints and shall not exceed 10% of the quantity of stone masonry. Care is to be taken that no dry work or hollow spaces shall be left anywhere in the masonry.

3.5 The work shall include.

3.5.1 All scaffolding – platforms, staging etc.,

3.5.2 Hacking and roughening of concrete or other surfaces for binding of the masonry.

3.5.3 Raking out joints for plastering and / or pointing.

3.5.4 Leveling up and preparing and pointing.

3.5.5 Building in holdfasts or similar inserts.

3.5.6 Keeping (the work) in damp condition for two weeks

3.5.7 Construction watery situation.

4.0 BRICK MASONRY:

4.1 GENERAL

4.1.1 All brick work should be carried out as shown on the drawings with setbacks, projections, cuttings, too things etc., wherever the proportion of cement mortar has not been specifically mentioned, cement mortar in the proportion of 1:6 shall be used. Flat brick arches shall be provided, wherever required, without any extra cost. Brickwork shall be kept wet while in progress till mortar has properly set. On holidays ro when the work is stopped top of all unfinished masonry shall be kept wet, should the mortar be dry, white or powdery, due to lack of curing work shall be pulled down and rebuilt at the contractors expense.

4.1.2 Table moulded bricks shall be locally available or brought from outside first quality having a minimum crushing strength of 40kg per sqcm and water absorption not more than 20% by weight. Bricks shall be thoroughly cleaned and well wetted. Table moulded bricks shall be soaked for at least 12 hours in fresh water before being used on the work.

4.1.3 Unless otherwise specified, brickwork shall be done in English bond with frog upwards. The bricks shall be bedded and joined with mortar in such a manner as not to leave voids. Each brick shall be correctly into position by tapping with the handle of trowel. Grouting of mortar slurry will not be allowed expect where necessary for special reasons and in such cases, prior permission of the Architect/ Employer shall be obtained.

4.1.4 A care shall be taken that each course of brick work is truly horizontal and perfect in bond and the face of the wall is straight, plumb and even. The mortar joints shall be 10mm in thickness, except where extra thickness is required for the purpose of bringing the work to the required height or level. Half bricks or bats shall not be used except for obtaining the bond and where absolutely necessary.

4.1.5 Brickwork in 239 mm wall: If bricks are of size such that the width of the header course does not come equal to the width of the stretcher course, the difference shall be made up during construction of brickwork itself by same mortar as used for construction of masonry to provide a plane vertical surface. The surface should also be scarified to receive plaster.

4.1.6 All junctions of walk shall be carefully bonded into the main walls. The rate of laying masonry will be up to a height of 100cm per day if cement mortar is used greater heights may be built only if permitted by the Project Engineer-Cum Estate Officer.

4.1.7 During rains, the work shall be carefully covered to prevent mortar from being washed away. Should any mortar or cement be washed away the work shall be removed and rebuilt at the contractors expense.

4.2 HALF BRICK WORK:

This shall be set in cement mortar as specified. Unless otherwise specified, the walls be reinforced with 2 no's of 6mm mild steel bars with tie bars at 1m interval on the top of the first course and at every fifth course thereafter. The cost of the half brick work shall include the cost of reinforcement where reinforcement of half brick walls is specified.

5.0 Wood Works:

5.1 GRP Door shutters as per the Engineer-in-charge/ Architects approval

5.2 GLAZING WORKS

All glass shall be specified in the drawings and schedule of quantities and free from air bubbles, specks and scratches or other defects. All glass shall be cut to fit the sashes or other members as required. All glass, shall be properly bedded, securely fixed and finished as indicated on the drawings. T.W beading moulded as specified shall be provided for fixing the glass. No glazing shall be complete until all the stains and marks have been removed from the surface of glass.

6.0 ALLUMINIUM DOOR, WINDOWS ETC.,

6.1 GENERAL

6.1.1 These shall be custom-built units of approved established manufacturer using standard aluminum alloy extruded sections generally conforming to the relevant basic concept drawings of the Architects and Schedule of quantities including necessary glazing's, fittings, fastenings, locking arrangements polysulphide sealants etc., to ensure water tightness.

6.1.2 Based on the Architects concept drawings, the contractor shall submit detailed fabrication/ assembly/ erection drawings for the approval of the Engineer-in- charge. Samples of each unit, based on the approved fabrication and assembly drawings shall be made by the contractor and got approved by the Engineer-in- charge before bulk fabrication and assembly of each unit

6.2 STORAGE AND HANDLING:

The contractor shall take particular care to stack the fabricated frames etc., on the site under cover. These shall be handled with care and stacked on edge of level bearers and supported evenly.

6.3 Before erecting- the frames coming in contact with concrete, masonry, plaster or dissimilar metals, shall be treated with a coat of zinc chromate. The contractor shall cover the work with transparent lacquer based or methacrylatesor cellulose butyrate, tithe surface from wet cement during installation. This coating shall be removed on completion. Before handing over, the alluminium work shall be washed with mild solution of non-alki soap and water.

6.4 The colour of anodizing shall be uniform mat natural finish otherwise stated and its sample shall be submitted for the Engineer-in-charge, approval before work commences. The section shall be anodized to a minimum thickness of 20 macros. The contractor must submit necessary evidence to the satisfaction of the Engineer-in-charge that Ae thickness of the anodisation is not less than 20 microns. In case of doubt the Engineer-in-charge may reject the materials.

6.5 TOLERANCE ON SIZE.

Frames should be made to fit the actual openings with not more than 5mm clearance all round. Discrepancies in overall width or height exceeding 5mm will not be allowed and frames will be rejected in such cases. Minor discrepancies acceptable to the Architect/ Employer shall have the gaps suitably filled. The sizes of frames, if noted in the drawings/ schedule of quantities, may vary up to plus or minus 50mm beyond which the rate payable will be increased or decreased proportionate to the changes, where the rate quoted is for one unit number, if the rate quoted is for superficial area, such area will be net finished size of the opening.

7.0 STEEL WORK:

The fabrication, supply and erection of the steel (Fe 500 N/mm2) work consists of accomplishing all related jobs like providing all labour, tools and plant, all materials and consumables such as welding electrodes, bolts and nuts, oxygen and acetylene gases, oils for cleaning etc., All of approved quality, the work shall be executed. In an expeditious and workmen like manner, as contemplated in the drawings and to the complete satisfaction of the project Engineer-cum – Estate Officer, CCMD, representative. The work shall also include providing shop primer coat of paint and grouting of hold down bolts.

8.0 PLASTERING- WORKS:

8.1 EXTENT AND INTENT

The contractor shall furnish all materials, labour , scaffolding, equipment, tools, plant and incidentals necessary as required for the completion of all plaster and wall finishes, subject to approval by the Project Engineer-cum- Estate Officer, CCMD.

8.2 GENERAL

8.2.1 Plaster as here in specified shall be applied to ail internal and external surfaces where called for Flazed tile dado, terrazzo dado and wall finishes other than plaster shall be provided where indicated on drawings and

schedule of finishes. Areas called for on drawings and typical shall be considered to apply to appropriate adjoining area whether shown on same drawings or not whether indicated or not.

8.2.2 All plaster works and other wall finishes shall be executed by skilled workmen in a workman like manner and shall be of the best workmanship and in strict accordance with the dimensions on drawings subject to the approval of the project Engineer-Cum-Estate Officer, CCMD.

8.2.3 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 the true plane, without any imperfections and shall be square with adjoining work and form proper foundation for finishing materials such as paints etc.,

8.2.4 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 Project Engineer-Cum-Estate Officer.

8.2.5 Wherever directed by the Project Engineer-cum-Estate Officer, CCMD, or other representative, all joints between concrete frames and masonry infilling 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 infilling shall be 24 gauge galvanized chicken mesh strip 400mm wide or as called for on drawings/documents which shall be in position before plastering.

8.3 CHASING AND CUTTING:

All chasings, installations of conduits, insert 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 150mm on both sides and patched with plaster of Paris as directed. All corners shall be rounded to a radius of 8mm or as directed by the Project Engineer-Cum-Estate Officer, CCMD.

8.4 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 Project Engineer-Cum-Estate Officer, CCMD.

8.5 PROPORTIONS:

The materials used for plastering shall be proportioned by volume by means of gauge boxes.

8.6 PREPARATIONS OF SURFACES.

The joints in all walls, both existing and freshly built shall be raked to a depth of 15 cleaned with wire brushes, dusted and thoroughly wetted before starting plastering work. Concrete surfaces to receive plaster shall be roughened by hacking over the
entire surface so that the skin of the concrete is completely removed, as approved by the Architect/ Employer to ensure proper key for the plaster.

8.7 PLASTER TO WALLS:

Unless otherwise specified, all works shall be plastered and finished as follows:

Internal faces : 20mm thick with cement mortar 1:6 (one part of cement and six parts of fine river sand) finished smooth with lime rendering.

External faces: 12mm thick base coat with cement Mortar 1:4 (one part of cement and four part of fine river sand) finished rough to receive the final coat and 6mm thick final coat with cement mortar 1:3 (one part of cement and three parts of coarse river sand) sponge finished.

8.8 MORTAR MIXING

Mortar shall be prepared as specified in small quantities as required and applied within fifteen minutes of mixing.

8.9 Plaster application shall be commenced only after the preparatory work is approved by the Project Engineer- Cum- Estate Officer, CCMD. Correct thickness of piaster shall be obtained by laying plaster screeds (gauges) at intervals of 1.5 m as directed. Mortar shall be firmly applied, well pressed, intothe joints, rubbed and finished to give a smooth and even surface to the satisfaction of the Project Engineer-Cum-Estate.

8.10 CURING

Finishing Plaster shall be kept wet for at least ten days after completion in hot weather, walls exposed to such shall be screened with matting kept constantly wet or by other approved means.

8.11 CLEANING PLASTERING:

Plaster to ceiling, so fits of stairs flight slabs and similar locations, where called for, shall be 12 mm thick comprising of one part cement and three parts of clean fine sand unless otherwise specified. The surface shall be brushed, swept clean and thoroughly wetted before plastering. Mortar shall be applied firmly pressed to the surface, rubbed and finished smooth evenly subject to the approval of the Project Engineer-Cum-Estate Officer, CCMD.

8.12 CEMENT MORTAR:

8.12.1 Cement mortar shall be of proportion specified for each type of work. It shall be composed of Portland cement and sand. The ingredients shall be accurately gauged and shall be evenly mixed together in a mechanical mixer. Care should be taken not to add more water than necessary. If hand mix is allowed, it shall be done on pucca waterproof platform. The gauged materials shall be put on platform and thoroughly mixed dry. Water shall Then be added and the whole then be added and the whole mixed thoroughly until the mix is homogeneous and of uniform colour. Quantity of mortar mixed should not be more than what can be consumed within half an hour of mixing.

8.12.2 Cement mortar mix are specified in 1:2, 1:3,1:4,1:5 etc., the first figure will mean one part of Portland cement by volume and the second will mean so many parts of sand by volume. For example cement mortar 1:4 would mean

One part of cement and four parts of sand.

8.12.3 Cement and sand must conform to relevant I.S specification

8.13 LIME RENDERING:

This will be prepared out of best quality fat lime slaked at site with fresh water not less than one week or not more than two weeks before use. All impurities, ashes and improperly burnt stuff shall be screened and picked out before slackening. Slaked lime shall be screened through to remove all unslaked materials, stones etc., so that only a fine creamy paste is available for rendering. Slaked lime is to be diluted with just sufficient water to give a thick consistent pulp suitable for effective covering of base surface. Before the base coat sets, the lime rendering is applied and finished smooth and the entire plastered surface is made truly plane.

9.0 FLOORING:

9.1 GRANOLITHIC FLOORING

9.1.1 General: The flooring shall be of specified thickness and shall consist of 1:2:4 concrete base or as specified and 12mm thick granolithic wearing coat.

The granolithic flooring shall be laid in alternate panels. The size of panels shall
be as decided by the Project Engineer-Cum-Estate Officer, CCMD

9.1.2 Laying of 1:2:4 concrete base:

9.1.2.1 The 1:2:4 concrete shall be of graded coarse aggregate of maximum size 10mm, coarse sand and cement. The ingredients shall be thoroughly mixed with sufficient water to obtain the required plasticity.

9.1.2.2 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.

9.1.2.3 The prepared 1:2:4 concrete shall be laid immediately after mixing on the fresh grouted base. The concrete shall be spread evenly and leveled carefully. Low places shall be filled, humps removed and the whole surface again leveled. The layer shall be compacted by ramming trowel led and allowed to set.

9.1.2.4 Mixing and laying of wearing coat: one part of cement in dry state shall be mixed with 1.5 parts by volume of well graded/crushed granite chips of

6mm maximum size. The ingredients shall be then mixed with sufficient water so for ordinary concrete. The wearing coat shall be laid 12mm thick over the base concrete immediately after it has set, compacted and leveled with a steel trowel. Just sufficient trowel ling shall be made to give a level surface. The surface should not be over trowelled as excessive trowelling will
bring the cement to the surface which shall be strictly avoided. When the initial set takes place, further compaction by steel trowelling shall be done and final brushing shall be made before the topping becomes too hard.

9.1.3 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.

9.2 A bed of cement mortar 1:4 shall be laid and properly leveled to average thickness of 20mm and the surface kept slightly rough to form a satisfactory key for the tiles, neat cement paste of honey like consistency

shall be spread over mortar bed, over such an area so that the paste will not harden before laying tiles. Slabs shall be soaked in water for 15 minutes and allowed to dry. The slab shall be then fixed as per approved pattern with thin coat of cement paste applied on back of each slab and tapped with a wooden mallet till it is properly bedded in level with adjoining slabs. Joints shall be not more than 1:5

mm wide. The surplus cement grout that may have come out of the joints has to be wiped off gently and joints cleaned. The joints shall, be filled up with grey or white cement with an admixture pigment to match the shade of the slab. The flooring shall be cured for 14 days. Then it shall be polished according to IS: 1443, and pointed with cement mortar: 1:1 (1 part of cement and 1 part of fine screened sand) mixed with matching colour pigment.

9.3 GRANITE SLAB WORK:

9.3.1 General: The slab must he of uniform thickness as specified, the variation in the thickness hot exceeding 12 mm and must be from the same source. They shall be of uniform texture and colour free of anv-yeins and streaks. All the edge shall be chiseled true to line, square and shape. The surface should be rough dressed/ one line dressed. Three line dressed pulmane dressed/mirror polish as specified.

9.3.2 Rough Dressing: The stone surface to be chisel dressed to one plane by removing all bushings so that the maximum depression is not more than 6 mm.

9.3.3 One Line Dressing: This is done after the rough dressing is completed by point chiseling so that the variations are not more than 4mm. Work includes rough dressing also.

9.3.4 Two Line Dressing: This is done after, one line dressing is done by chiseling so that variations are not more than 2.5mm work includes rough and one line dressing also.

9.3.5 Three Line Dressing: This is done after two lines dressing is over by chiseling so that variations are not more than 1.5mm work includes rough, one line dressing also.

9.3.6 Pulmane Dressing: After the three line-dressing is over, the surface is smoothened by using a special pulmane tool to further even out three line dressed surface so that the maximum variation in surface evenness is not more than 1.0mm work includes rough, one line, two line and three line dressing also unless otherwise stated.

9.3.7 Mirror polishing: The surfaces are to be polished by grinding using manual or mechanical process to give a smooth even perfect plane surface or as may

be directed. The polished surface should reflect light like a mirror and must be free from scratches and depressions.

9.4 GLAZED TILING

9.4.1 Glazed tiles shall be from an approved manufacture conforming to IS.777 of specified size, thickness and colour, All specials viz coves, internal and external angels, corners beads etc., shall be used wherever directed. Under layer of 12mm average thickness of cement mortar 1:3 proportion shall be laid tiles shall be well soaked in water washed clean and set in cement grout each tile being gently tapped with wooden mallet till it is properly bedded and in level with the adjoining tiles. The joints should be kept as thin as possible and in straight lines or to suit the required pattern after tiles have been laid surplus cement grout shall be cleaned off the depth of % mm and all dust and loose mortar removed joints shall then be flush pointed with white cement if necessary mixed with pigment to match the colour of the tile. The floor / dado shall be kept wet for 14 days, after curing the surface shall be washed with mild hydrochloric acid and clean water, the finished floor/ dado shall not sound hollow when tapped with wooden mallet, the rate will include the cost of under layer of cement mortar.

10.0 PAINTING

10.1 The specifications covers the various types of all surfaces thought the interior and exterior of the building the number of coats required in various situations and also the type of finish required for the several items of work such as cement based paint, plastic emulsion point, oil bound distemper etc., are specified in the schedule of quantities and specifications.

10.2 Before commencement of the work, the contractor shall provide sample panels of painting at this own cost for the approval of the Project Engineer-Cum-Estate Officer-CCMD, to enable him to keep an accurate check on the materials supplied and final shade to be painted. It is however, the responsibility of the contractor to provide any deviations and defects shall have to be Rectified by the contractor at his own cost.

10.3 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 Project Engineer-Cum-Estate Officer, CCMD during progress of painting, it is of painting work to remove all paint and varnish spots from floors, walls , glass panes and other surfaces and restore them to original conditions. The work generally touched up shall be attended to after all workmen have left. Accumulated – material, rubbish etc., have to be cleared and the premises left in clean, orderly and acceptable conditions.

10.4 Contractor shall provide scaffolding wherever necessary erected on double supports tied together by horizontals. No ballies, bamboos or planks shall rest on or touch the surface, which is being painted. Contractor is demand to have considered the following while tendering and no extra claim on account of these will be entertained.

10.4.1 Supplying the paint and other materials required of approved colour and brand.

10.4.2 Preparing the surfaces to be painted.

10.4.3 Providing and erecting scaffolding and removing the same after completion of the

10.4.4 Lifting of materials to any height and painting at all levels.

10.4.5 Applications of painting as per the specification and to manufactures instruction.

10.4.6 Curing, protecting the painted surfaces and adjacent work and thoroughly cleaning of premises.

10.5 The paint shall generally conform to the chemical composition and other characteristics laid down in the relevant Indian standard specification. The entire materials required for painting work shall be obtained direct from approved manufactures or their authorized agents and brought to site in original manufactures containers with seals unbroken.

10.6 Paint shall be ready mixed of quality of the approved brand and manufacture. Mixing of paint by the contractor at site will not be allowed, except preparation and their quality shall be strictly maintained as per manufacture's instruction and all as directed by the Project Engineer-cum-Estate Officer, CCMD. 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 opinion of the project Engineer-Cum-Estate Officer, CCMD) shall not be permitted to be used on the works and shall be removed from site forthwith. Any materials found not conforming to

the relevant specifications shall have to be removed by the contractor from the site at his own expenses.

10.7 Providing two coats of synthetic enamel paint of approved make colour over one coat of primer on plastered surfaces, wooden surfaces and steel

surfaces: A fully putty coating has to be given after primer coat in the case of wooden surfaces. The putty shall be made from pure whiting mixed to the proper consistency with new linseed oil, a little whilte lead being mixed to

help hardening of putty. On no account putty is to be used before primary coat. Primers to be used shall be according to the manufacture specifications.

10.8 The manner of taking measurements will be in accordance with ISI: 1200.

11.0 WHITE WASHING

White wash shall be prepared from fat lime or shell lime slaked on site mixed with just enough water to make a thick paste and allowed to remain for at least 7 days before use. At the time of using the paste shall be diluted with just sufficient water and strained through cloth. 4 kg of gun dissolved in hot water shall be added to each cubic meter of cream (115 GMS per Sft). Ultra marine blue or other approved locally available colour pigment shall be added to give required whiteness. The number of coats as specified in the bill of quantities shall be added to give required whiteness. The number of coats as specified in the bill of quantities shall be applied by using flat brushes or spray pimps, on surface prepared. Each coat shall be allowed to dry before next coat is applied.

12 .TREATMENT FOR SUNKEN FLOOR SLAB:

A. Brick bat aggregate shall be from well burnt bricks. The proprietary water proofing comwund and the quantity to be used shall be as per para 15.1

B. The surface shall be thoroughly cleaned with wire brushes. All loose scales shall be removed and dusted off. The surface (bottom as well as sides) shall be treated with cement slurry admixed with proprietary water proofing compound to penetrate interstices and 1111 p al 1 the porosotoes in the surface.

C. After the slurry coat is laid, a layer of well burnt brick bats/ aggregates of about 40mm size shall be laid in cement mortar of mix as specified by the specialist firm but not leaner than 1:5 (a cement : 5 coarse sand) admixed with proprietary water proofing compound the mortar being filled to half the depth of the aggregate. The brick bat/aggregate layer shall be rounded off at junctions with the beam all etc., and tapered towards top to a height of 100mm long beams/ wall, etc., curing of this layer shall be done for 3 days.

D. After curing the surface shall be applied with a coat of cement slurry admixed with proprietary water proofing compound.

E. Joints of brick bat/ aggregate shall be filled fully with cement mortar of mix as specified by the specialist firm but not leaner than 1:4 (1 cement. 4 coarse sand) admixed with proprietary water proofing compound and top finished with average 20mm thick layer of some water. This layer of mortar shall be continued to the sides of beam. Wall etc., the height upto which this treatment is to be extended on the sides shall be as directed by the Engineer-in-charge.

The surface shall be finished smooth with cement slurry admixed with proprietary water proofing compound.

F. While the water proofing treatment is 3qrie it shall be ensured that the outlet pipes are properly fixed arid the gap between the wall and pipes are properly filled with brick/stone aggregate and cement mortar admixed with proprietary water proofing compound and grouted with cement slurry admixed with proprietary water proofing compound by injection process.

G. Water proofing treatment shall be cured for 10 days

H. Measurements: measurements for the floor treatment shall be taken on plain area of floor treated nothing extra shall be paid for rounding off at junctions and taking the treatment along sides of beams and walls for about 100mm sides of beam/wall etc., where the treatment is only with mortar shall be measured and paid separately , length and breadth shall be measured correct to once centimeter and area calculated correct to 0.01 sqm

I. Rates: The rates shall include the cost of all labour and material involved in all the operations described above. Base treatment and sides treatment will be paid separately under respective items.

PART II: SPECIFICATIONS FOR WATER SUPPLY AND SANITARY WORKS

1.0 GENERAL
1.0 SCOPE OF WORK:

The general character and the scope of work to be carried out is illustrated in the drawings and specifications. The contractor shall carry out and complete the said work under this contract in every respect in conformity with the rules and regulations of the local authority. The contractor shall furnish all labour, supply and install all materials, appliances, tools, equipments etc., necessary for the complete provision and testing of the whole plumbing services installation as specified here as per the relevant ISI codes as shown on the drawings. This also includes any material, appliances, equipment not specifically mentioned herein or noted on the drawings as being furnished or installed but which are necessary and customary to make a complete installation as shown on the drawings or described herein, properly connected and in working order.

In general, the work to be performed under this contract shall comprise of the following:

1.1 All incidental jobs connected with water supply services installation, such as excavation in trenches and back filling, cutting chases in concrete, brick etc., and making good cutting drilling holes through walls, floors and grouting for embedding of fixtures, equipment and fixing of valves, pumps etc.,

1.2 Furnish and install a complete workable, service installation as shown on the drawings and as per the latest ISI specifications including all that which is reasonably inferred.

1.3 Complete installation of internal water supply system.

1.4 Complete installation of the sewerage and sewerage appurtenances internally and around the building.

1.5 Complete installation of all sanitary and plumbing fixtures.

1.6 Co-operation with other crafts in putting the installation in places. Any work without regard or consultation with other trades, shall be removed by the contractor without any traditional cost to the employer, to permit the proper installation of all other work, as prescribed by the architects.

1.7 Repair all damages done to the premises as a result of this installation and remove all debris arising there from to the satisfaction of Project- Engineer – cum- Estate Officer.

1.8 Cleaning of all plumbing “fixtures, testing and showing satisfactory performance all the fixtures at the time of handing over to the Project Engineer-cum-Estate Officer.

1.9 It is the responsibility of the contractor to safe guard and takes care of all the fixtures fitted until the time handing over to the Project Engineer-cum-Estate Officer.

1.10 Painting of all concealed and exposed pipes as specified.

1.11 Assume full responsibility of all statutory requirements.

1.12 At the completion of the work, furnish necessary information like invert levels and layout of pipeline etc., and prepare final completion drawings to the Project-Engineer-cum-Estate Officer.

2.0 REGULATIONS AND STANDARDS:

2.1 The installations shall conform in all respects to the following board list of standards in general:

- IS 3114 – 1965 : Code of practice for laying of CI pipes
- IS 1230-1968 steel : Specifications for mild steel tube, tubular and other pipe fittings part I
- IS 1536 – 1980 for : Centrifugally cast (spun) cast iron pressure pipes water gas and sewerage.
- IS 780 – 1980 : Sluice valve for water works purposes
- IS 1520 – 1980 : Horizontal centrifugal – pumps.

2.2.1 The installation shall also be in conformity with the byelaws and requirement 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 specification shall take precedence over the said regulations and standards. Wherever the specification require something which will violate the regulations, the regulations shall govern.

3.0 PERMITS AND TESTS:

On completion of the work, the Contractor shall obtain and deliver to the Project Engineer-cum-Estate Officer, CCMD certificates of final inspection and approval by the local authority as may be applicable. The Project Engineer-cum-Estate Officer, CCMD shall have full power to require the materials or work to be tested by any independent agency at the contractors expenses in order to prove their soundness and adequacy.

4.0 DRAWINGS AND SPECIFICATION

The drawings and specification shall be considered as part of this and any work or materials shown on the drawings and not called for in the specifications or vice versa shall be executed as if specifically called for in both. The contract drawings shall indicate the extent of general, arrangement of the fixtures, drainage system etc., and essentially diagrammatic. The drawings indicate the points of supply and termination of pipe runs and broadly suggest the routes to be followed. The work shall be installed as indicated on the drawings, however, any changes found essential to coordinate, this work with other trades shall be made without any additional cost. The data given herein and on the drawings is as exact as could be secured but its complete accuracy is not guaranteed. The drawings and specifications are of the assistance and guidance to the contractor and exact location distance and levels will be governed by the individual building and site condition, therefore approval of the Project Engineer-cum – Estate Officer, CCMD on tracing cloth.

5.0 MANUFACTURERS INSTRUCTIONS:

Where manufacturers have furnished specific instructions, relating to the materials used in this job, covering points not specifically mentioned in job, covering points not specifically mentioned in these documents. These instructions shall be followed in all cases.

6.0 CHANGE IN DIMENSION

If the size of the fixture mentioned is not available, then the nearest available size shall be fixed with due consent of the Engineer-in-chief, CCMD.

7.0 MATERIALS:

7.1 Materials shall be of the best quality obtainable and unless otherwise specified they shall conform to the respective Indian Standards Specification.

7.2 Samples of all materials shall be as per the list of approved branch manufacture. The samples shall be got approved before placing order and the approved samples shall be deposited with the Engineer-in-chief, CCMD.

7.3 In case of non availability of materials in merits, sizes, the nearest size of EPS units shall be provided with prior approval of the Engineer-in-chief Project Engineer-Cum-Estate Officer, CCMD, for which no extra will be paid.

8.0 TRENCHES FOR PIPE DRAINS:

8.1 Opening out trenches: In excavating the trenches etc., the road metalling pavement curbing etc., are to be placed on one side and preserved for reinstatement when the trench or other excavation shall be filled up at no extra cost.

Before any road metal is replaced, it shall be carefully shifted, the surface of all trenches and holes shall Jre restored and maintained to the satisfaction of the Architects. The contractor shall not-cut or break down any live fence of trees in the one of proposed works but shall tunnel under them unless the Architects shall order to the contrary. The contractor shall scrub up and

clear the surface over the trenches and other excavations of all stumps, roots and all other encumbrances affecting execution of the work and shall

remove them from site to the approval of the Project Engineer-Cum-Estate, Officer, CCMD.

8.2 Cutting of roads: All works across the roads, shall be carried out as per the directions of the Project Engineer-Cum Estate Officer, CCMD.

8.3 Excavation to be taken to proper depth: The trenches shall be excavated in all conditions of soil and to such a depth that the pipelines shall rest as described in the several clauses relating thereto and so that the inverts may be at the levels given the drawings. In loose soil, the Project Engineer-cum-Estate Officer, CCMD. May order the contractor to excavate to a great depth than shown on the drawings to fill up the extra excavation with concrete, sand, gravel or other materials. For such authorized filling of materials the contractor shall be paid extra at the rates laid down under clause 20.0 of the general conditions of contract, if the extra work was ordered by the Project Engineer-Cum-Estate Officer, CCMD. If the contractor should excavate the trench to a greater depth than is required without a specific order to that effect in writing, the extra depth shall have to be filled up with concrete at the contractor's own cost to the requirements and satisfaction of the Project Engineer-Cum- Estate Officer, CCMD.

8.4 Refilling: After the pipes or other fittings has been laid and proved to be water tight, the trench or other excavation shall be refilled. Utmost care shall be taken in doing this, so that no damage shall be caused to the pipes and other permanent works. Filling in the trenches and up to 50cm above the pipes shall consist of the finest selected materials placed carefully and consolidated. After this has been laid, the trench and other excavation shall be refilled carefully in 15cm layers with materials taken from the excavation each layer being watered and consolidated.

8.5 Settlement and Damages : The contractor shall, at his own cost make good promptly, during the whole period the works are in hand, any settlement that may occur in the surfaces of roads, beams, footpaths, gardens, open spaces, etc., whether public or private caused by his trenches or by his other excavations and he shall be liable for any accidents caused thereby. He also shall at his own expenses and charge, repair and make good any damage to the buildings and other properties.

8.6 Disposal of surplus soil: The contractor shall at his own cost and charge, dispose within the site all surplus excavated material not required to be used on the works to within a distance of 50cm.

8.7 Timbering of pipe line and trenches: The contractor shall at all times support efficiently and effectively the sides of the pipe trenches and other excavations by suitable timbering, piling, sheering etc., without any extra cost. All timbering, sheeting and pilling with their wallings and supports shall be of adequate dimensions and strength and fully braced and strutted so that there is no risk of collapse or subsidence of the walls of the trench. The contractor

shall be held accountable and responsible for the sufficiency of all timbering, bracing, sheeting and pilling used and for all damages to persons and property
resulting from the improper quality, strength, placing, maintenance or removing of the same.

8.8 Removal of water from pipeline, trenches etc., : The contractor shall at all times during the progress of work keep the trenches and excavations free from water which shall be disposed of by him in a manner as will neither cause injury to the public health nor to the work completed or in progress nor to the surface of any roads or streets nor cause any interference with the use of the same.

8.9 The width of the excavated trench shall be as per the table given below width at bottom

- Excavation up to 90cms depth 33cm 33cm
- 90 to 150cm depth 60cm 60cm
- 150 to 300cm depth 75cm 75cm
- 300 to 500cm depth 90cm 100cm

8.10 Protection of existing services : All pipes, water mains, cables etc., met in the course of excavation shall be carefully protected and supported.

8.11 Concreting: All pipes at shallow road crossings and made up ground shall be laid on a bed of 15cm concrete with one part of cement, 4 parts of sand and 8 parts of 40mm gauge stone metal property consolidated. Concrete shall be laid to the full width of the trench and also in haunches.

8.12 CAST IRON PIPES AND FITTINGS

8.12.1 Cast – iron soil, waste and vent pipes and fittings shall be of heavy quality conforming to IS 1536-1967 and fittings to IS 1537-1960

8.12.2 Claying and Jointing: The pipes shall be laid, underground, under the floors, or on walls either buried or exposed as the case may be as shown on the drawings.

8.12.3 Cast Iron, Pipes: Cast iron pipes shall be laid and jointed in conformity with the code of practice for laying of cast iron pipes. Cast iron pipes shall be jointed by best quality caulking lead free from all impurities in wet trenches, joints shall be made with lead wool. The spigot shall be centered in the adjoining socket by tightly caulking in sufficient turns of tarred gaskin to leave unfilled the required depth of socket for lead. Where the

gaskin has been caulking tightly home, a jointing ring shall be placed round and barrel and against the face of the socket. Molten lead shall then be poured into fill the remainder of the socket in one with suitable tools by hammering right-round the joint, to make up for the shrinkage of the molten metal on cooling and shall preferably finish 3mm behind the socket face. Lead for caulking shall conform to IS 782-1966. The quantity of lead to be filled per joint in various sizes of cast iron pipes. Shall be as follows:

Water main pipes	**Lead /joint (Kg)**
80mm (3") pipe	1.8
100mm (4") pipe	2.2
125mm (5") pipe	2.6
150mm (6") pipe	3.4
200mm (8") pipe	5.0

8.12.4 The joints and pipes laid for water supply systems shall be tested to a pressure of 12kg.sqcm for two hours without developing leaks/fall in pressure. The drainage pipelines and joints shall be tested to a head of 150cm for two hours without developing leaks/fall in pressure. In case of leaks the piping shall be redone in such portion and the test repeated till achieving satisfactory results.

8.12.5 Underground piping shall be of CI tyton type confirming to IS class A 1536 the piping shall be laid not less than 1Mt below the ground level. Suitable masonry/ PCC support anchor blocks shall be provided at change in direction with soil conditions are unsatisfactory.

8.12.6 All fittings shall be CI flanged confirming to IS 1538. The flanges shall be drilled as per relevant Indian Standards Flanges shall be faced and cleaned and shall have jointing of rubber insertion or asbestos compound. In case of tytronpipes the joint shall be made by using rubber gaskets as per manufactures specification. The joint shall be capable of withstanding a pressure of 10.5 Kg/Sqcm.

9.0 SLUICE VALUES

Sluice valves shall conform to IS: 780 valves shall be of right hand type. Only flanged valves shall be used . Valve wheel shall have an arrow engraved or cast thereon showing the direction of turning open or close operation.

10.0NON-RETURN VALVES

Non return valve shall be of cast iron with gun metal seat. Non return of valves shall be of flanged type. Spring loaded valves shall not be used. The valves shall be suitable for a test pressure of 21 kgs/Sqcm.

11.0 MODE OF MEASUREMENT

11.1 Excavation (General): the width of excavation shall be limited to as said earlier.

11.2 Cast iron pipes: Cast iron pipes shall be measured along the center line of the pipe including all specials in Rmt. The quoted rate for respective item shall be Rmt, and shall include the following:

A. Cost of respective pipes and specials and jointing materials etc.,

B. Laying fixing and jointing with necessary clamps, brackets, bolts, nuts and washers.

C. Making good all damages to the parts of the building to suit the surroundings and making good the defects if any.

D. Testing and making good the defects if any

Valves: Valves shall be per number only and shall include the following:

A. Cost of valve and jointing materials

B. Fixing and jointing with necessary bolts, nuts, rubber insertion etc.,

C. Testing and making good the defects if any:

11.4 GI Pipes and Fittings:

The pipes shall be of the medium quality (class B) unless otherwise specified and shall be of galvanized iron, screwed socketed and shall conform to IS: 1239. They shall be manufactured by a firm of repute. All fittings shall be malleable iron galvanized fittings of approved best Indian make.

11.4.1 LAYING AND FIXING

11.4.1 Where pipes have to be cut or re-threaded, ends shall be carefully out so that no obstruction to bore is offered. For internal work all pipes and fittings shall be fixed truly vertical and horizontal either by means of standard pattern holder bat clamps keeping the pipes (12mm) clear of the wall everywhere or concealed as re-directed.

11.4.1.2 For external work, G.I pipes and fittings shall be laid in trenches. The width of the trench shall be the minimum width required for working. The pipes laid underground shall not be less than 60cms. From the finished ground level. The work of excavation and refilling shall be done as specified elsewhere or concealed as directed.

11.4.2 Painting : The burred pipes shall be painted with two coats of bit mastic paint.

11.4.3 Testing: Before any pieces are painted or covered, they shall be tested to a hydrostatic pressure of 7 kg/sqcm pressure shall be maintained for at least eight hours without appreciate drop in pressure, in addition to the sectional testing of water supply pipes, the contractor shall test the whole installation to the entire satisfaction of the Project Engineer-Cum – Estate Officer, CCMD. He shall rectify any leakages, failure of fittings or valves.

11.4.4 Mode of measurements: G.I pipes above and below ground shall be measured along the center line of the pipes and fittings the quoted rate for respective item shall be per Rmt and shall include the following:

a) Cost of respective pipes and specials
b) Laying, fixing and jointing with necessary clamps
c) Cutting hole and chases in walls floors, etc., and making good the same
d) Testing and making good the defects if any.

PART III: SPECIFICATIONS FOR ELECTRICAL INSTALLATION

1.0 LEGEND:

1.1 Internal electrification (general lighting and power) is for general lighting for fans, lugs, lights etc.

2.0 GENERAL

2.1 The electrical installation shall comply in all respects with the requirements of the Indian electricity act, 1916 as amended from time to time and the Indian Electricity rules and Regulations currently in force.

2.2 Materials, fittings and appliances shall be of the best quality and of approved make/ manufacture; conforming to the relevant Indian Standard Specifications. Samples must be attached to Project Engineer-Cum-Estate Officer, CCMD for their approval well in advance, at least prior to execution of work, (tenderers tenders may specify the name of makers/manufactures of the materials, fittings and appliances which they propose to use, while tendering)

2.3 Workmanship shall be I Class, conforming to the requirements of the I.E Rules and regulations currently in force. 2.4 it shall be the contractors responsibility to prepare the necessary drawings/ chart, and submit the same through proper channel to the concerned authorities for approval of the installations:

3.0 GENERAL LIGHTING:

3.1 The wiring is to be done in concealed conduit for full unless otherwise specified. The distribution of circuit distribution boards and main board are as indicated in the layout.

3.2 The circuit distribution boards are all to be completely embedded in walls to make them flush to the surface.

3.3 The main control board to be fixed in position as indicated in the layout and in the manner indicated by the Project Engineer-Cum-Estate Officer, CCMD, the power supply is so be drawn from the existing overhead line through an underground cable system, using necessary size G.I pipe at the wall entry. The cable jointing work should be done by an experience person specially trained for such jobs. The scope of this work includes laying cables in trenches (the trenches to be prepared by the contractor himself) and the cable jointing using necessary compounds.

3.4 The scope of this work covers the supply and installation of fittings like lighting fixtures, ceiling fans, exhaust fans, complete in all respects like mounting accessories lamps, wiring etc.,

3.5 The wiring for lights, plugs, fans etc., shall be of "looping-in-system" and in each and every switch box a neutral point shall be made available for testing purpose.

3.6 Not more than two power socket outlets should be connected in the same circuit and the power plugs be wired with PVC insulated conductor wires drawn in conduit.

4.0 POWER:

4.1 Power wiring in conduits shall unless otherwise specified, also be of concealed type run on walls independent of general lighting wiring based on the principle of overhead bus bar systems.

4.2 The mains will be terminated and connected through immediate junction boxes as shown in the layout and type of termination shall be as detailed in the layout: The tapping connections to load circuit boards shall be from the individual intermediate junction boxes, which will be at suitable capacity fuse units. The neutral connection shall be direct without fuse.

4.3 The tapping connections to load circuit boards shall be from the individual intermediate junction boxes, which will be at suitable capacity fuse units. The neutral connection shall be direct without fuse.

4.4 The control boards for the load outlets shall be fixed at a height of not more than 5 ft from the floor level and shall be in such a position as will bw indicated by the Project Engineer-cum-Estate Officer at the time of execution.

4.5 All the intermediate junction boxes and the load control boards shall be suitable for flush mounting on the walls.

4.6 A portion of the power main pipes shall be possible to run the same on walls.

5.0 EARTHING:

5.1 Earthing in the case of power wiring shall be with soft drawn bars copper wire of size not less than 10 SWG, in double run suitably fixed on to the surface of the conduit by means of copper earth clips to ensure perfect electrical contact and the earthing wire shall run throughout the length of the conduit. At the main board level of individual earth wire runs shall be suitably interconnected firmly by means of earth clips to ensure proper continuity of earth connections, as well as full electrical contacts with the conduit pipes of the intermediate junction box and the load control boards and any other metal works in the wiring system shall all be suitably connected for perfect earth connections with insulated copper wire of size not less than 22G interconnections to the main earth loads. All the above works shall be in conformity with IS 732-1963Code of practice for electrical wiring installation (system voltage not exceeding 650v)

6.0 GENERAL LIGHTING:

6.1 Insulated copper wire of not less than 22 G shall be used for the running of continues earth wire all along with conduits and shall be firmly bounded by means of suitable size earth clips, externally in order to have good electrical contact Bare copper wire sizes not less than 4 SWG shall be used for the main earthing connections.

6.2 These two earthing point outside the building shall be according to the I.S specifications for pipe earthing (IS 732-1963) provision shall be made at the light and fan outlets for earthing connections, so that they can be used wherever found necessary instruction from the Project Engineer-Cum-Estate Officer, CCMD.

7.0 Materials:

7.1 The conduit pipes to be used shall be heavy gauge not less than 2mm thick of PVC conduit and good quality. The minimum size of conduit to be used shall be

¾ " dia. The conduit fittings like bends, junction boxes etc., should be of standard quality and shall be with good deep matching threads to suit the conduit pipes and shall be free from burs etc.,

7.2 The switch boxes etc., shall be metal clad out of M.S Sheets not less than 16SWG either square or oblong in shape and in suitable sizes as per requirements and shall be provided with earthing terminal screws for body earthing connections. The depth of the boxes shall be such that they should fully be embedded in the wall, flush with the finished wall surfaces.

7.3 The top covers of these boxes be of either laminated sheets of thickness between 1/8" to ¼" as required for perpex sheet.

7.4 The control switches for lights shall be hush type as specified 7.5 the 5 amps plugs and socket shall be 3 pin flush type

7.5 The 15 amps 3 pin power plugs shall be preferably flush mounting type with a combined switch and shall be controlled by a fuse or a miniature circuit breaker single pole type.

8.0PARTICULAR SPECIFICATIONS:

8.1 Type/system of wiring : only loop in system of wiring with PVC in conduit (surface as per details in schedule) and junction boxes where absolutely necessary and only at the places approved by the Engineer-in-Chief, CCMD.

8.2 Wires: Single core multistrand copper PVC of approved make and conforming to

8.3Conduit:Heavy gauge of 2mm thick PVC conduit pipe. Conduit drops must be laid to plumb. PVC bushings should be provided at all ends of conduits

8.4Workmen: All work must be executed by licensed electrical wiremen possessing valid licences.

8.5 Switches: All 5 amps switches and 3 pin wall plugs must be of good quality or equivalent approved make.

8.6 Florescent Fittings: Light fittings should be complete in all respects including clamps reflectors, tubes, chokes, condensers, starters and internal wiring, extras on this account not admissible. The rate quoted must include these elements as well. Any damage to these fittings during erection/ installation should either be made good or fitting replaced totally.

8.7 Cables: Cables shall be with aluminium conductor, PVC insulated conforming to IS specification.

8.8 The contractor should enclose the pamphlets, catalogues of various materials offered while submitting the tender. The tenderers are required to submit along with their tender the list of makes of all equipments, fittings, fans, lamps, switches, gear, fuse gear, conduits and accessories, wiring materials and accessories. Non compliance to this will subject to their tender for disqualification or rejection.

8.9 Earthing: All machine parts, metal covers, switches, panels, fittings should be I/P earthed as given in the schedule and this has to be approved by the electrical inspector. The procedure should be strictly from L.E.E Regulations and Indian Electricity Act. Earthing in continuity for conduit pipes throughout and at junction boxes should be maintained by check nuts on either side and earthing clamps where necessary.

8.10 Boards: The main board and the sub distribution boards should be metal clad. The M.S sheet used for the box should be 3 mm thick and holes of the required diameter for incoming and outgoing pipes should be drilled in it.

8.11 Wiring diagrams: The contractor shall, on completion of electrical works executed in the budding furnish in duplicate the wiring diagrams indicating the light, power, fan points/outlets etc., indicating the colour code also so as to enable easy identification of circuit

I.S SPECIFICATIONS

A general list of IS Specifications applicable to this contract is appended here with

IS CODE NO

SP 7-1970	National Building Code
1885	Symbols
4648	Guide for electrical layouts
5578	Marketing of insulated conductors
5216	Guide for safety in installations
374	Ceiling fans
5077	Decorative light fitting
1913	Safety requirement of fittings
1536 & 6616	Ballasts
3323	Bi-pin lamp holders
2215	Starters for fittings
2418	Fluorescent lamps
1569	Discharge lamps
3324	Holders
5513	Boxes for enclosures for Ele Accessories
Sp-7-2675	Fuse distribution boards
371	Ceiling roses
2667 & 3387	Metal conduits – fittings and accessories
1653	Rigid metal conduits
3854	Switches for lighting circuit control
1293	Three pin plugs
2351	Danger Board
3106	Installation and selection of fuses
3043	Earthing
2147	Degree of protection by switch and control gear
4237	Requirement for switch and control gear
40437	Heavy duty air break switch and Sf units
2208	HRG fuses
375	Switch gear bus bars
2607	Air break isolators
1951	PVC sleevings
1255	Code of practice for laying cables.
1694	PVC insulated cables.
1554	PVC cables.
3961	Current rating of cables.

LIST OF APRPOVED MAKES FOR CIVIL WORKS

Sl No	Item		Make
1	WINDOWS		
2	ALUMINIUM		JINDAL/INDAL/HINDAL CO
3	STEEL		TATA/SAIL
4	DOORS		SAL WOOD DOOR WITH FLUSH SHUTTER, GRP LAMINATED DOORS
5	GLAZING		JOHNSON, KAJARIA
6	GLAZED TILES		JOHNSON, KAJARIA, NAVEEN
7	CERAMIC TILES		JOHNSON, KAJARIA, NAVEEN
8	PAINTS AND DISTEMPER		ASIAN BRAND, APEX BRAND
9	SYNTHETIC ENAMEL		ASIAN BRAND
10	WATER PROOFING COMPOUND		FOSROC, DR.FIXIT
11	VITRIFIED FLOORING		JOHNSON, KAJARIA
IF THE ABOVE BRAND IS NOT AVAILABLE THE EQUIVALENT MATERIAL TO BE APPROVED BY THE ENGINEER-IN-CHARGE BEFORE FIXING			
ALL MATERIAL SHALL HAVE TO BE GOT APPROVED FROM THE ENGINEER-IN-CHARGE BEFORE BEING USED.			

List of approved makes – Electrical works		
A	PVC CONDUITS	UNIVERSAL/UNI PLAST
B	UG CABLES	UNIVESAL /CCI/ANCHOR/GLOSER/FINO LEX
C	COPPER WIRES	WINCAP/FINOLEX/ANCHOR
D	DP SWITCHES, SP SWITCHES AND SOCKETS	ANCHOR/ROMA
E	MCB/ELCB	MDS/L&T HAGER
F	SWITCH FUSE UNITS/FISE LINK	GEC/EE/L&T/SCHNIEDER
G	FLOURESENT /CFL TUBE FITTING	PHILIPS/CROMPTON
H	LAMPS	PHILIPS/CROMPTON
I	EXHUST FANS	GEC/CROMPTON
J	TELEPHONE CABLES	DOORAVANI/DELTON
K	MAIN MCB-DB (MDB)	L&T HAGER/ABB/SCHNIEDER
L	DB-KIOSK	L&T HAGER/MDR/ABB/SCHNIED ER
M	CT	L&T HAGER/ABB/SCHNIEDER
N	VOLT METER – ANALOGUE METER	L&T HAGER/ABB/SCHNIEDER
O	AMMETER-ANALOGUE METER	L&T HAGER/ABB/SCHNIEDER
P	INDICATING LAMPS	L&T HAGER
Q	GRIMMING LUNGS	DOWELS MAKE ONLY
R	CEILING FAN	CROMPTON GREAVES
S	GEYSER	RACOLD/BAJAJ
If the above brand not available the Equivalent Material to be approved by the Engineer-in-charge before fixing		
All materials shall have to be got approved from the Engineer-in-charge before being used.		

List of approved makes – Electrical works		
Sl	DESCRIPTION	MAKE
1	GI PIPES	TATA/JINDAL
2	PUMPS	KIRLOSKAR
3	PRESURE GAUGE	H GURU
4	PRESSURE SWITCH	INDFOSS
5	MOTOR CONTROL PANEL	MICRO POWER SYSTEM/ SUBRAMANYAM INDUSTRY
6	CABLES	TOSHIBA/HAVELLS/UNIVERSAL
7	BUTTERFLY VALVE	INTERVALVE/ADVANCE
8	NON RETURN VALVE	INTERVALVE/ADVANCE
9	Y-STRAINER	ANIL/LEADER/SAMSUNG
10	HYDRANT VALVE	ISI MARKED
11	HOSE BOX	GURAD FIRE/ SUBRAMANYA INDUSTRIES
12	CP HOSE	ISI MARKED
13	BRANCH PIPE	ISI MARKED
14	BALL VALVE	ITAP/R BRAND
15	FIRE HOSE REEL DRUM	OMEX
16	FIRE EXTINGUSHERS	ISI MARKED
If the above brand not available the Equivalent Material to be approved by the Engineer-in-charge before fixing		
All materials shall have to be got approved from the Engineer-in-charge before being used.		

SECTION 6:SPECIAL CONDITIONS

1) No Labour Camp inside the Indian Institute of Science Campus
2) Bill of Quantities or commercial bid has been disabled in thee-procurement portal of GoK, which is as per the Government Orders vide FD/165/EXP-12/2017 dated 21/03/2017 and FD/539/EXP-12/2017dated02/06/2017. Uploading the BOQ scanned document shall lead to disqualification of the bid. Whereas the prices of all the line items are to be entered on the e-procurement portal inclusive of taxes.
3) Any damage to the existing service lines during execution of work shall be got rectified by the tenderer at his cost and risk.
4) Excavated earth/debris shall be removed from the work site at the end of the day
5) Tenderer shall use new shuttering material exclusively for this work
6) Only 53 Grade OPC cement of brand Birla Super / ACC / Ultra tech shall be used
7) The reinforcement steel used shall be of Grade Fe 500 tar steel of brand TISCO / SAIL / JSW.
8) Concrete Design Mix shall be got approved by the competent authority
9) Tenderer shall have qualified Site Engineer and Quantity Surveyor at site till the end of the Project
10) The Agency after completion of work should submit final bill within 90days From the date of completion of all work . If the agency fails to submit the final bill with in 90days. IISc will take unilateral decision to check the final measurement through committee and finalize the final bill

The Agency should execute single with the following quantities in similar nature of work;

- M20-30.00 Cum
- Burnt Brick Masonry Work of 45.00 Cum
- Size stone Masonry of 25.00 +
- Dismantling of steel section of 5.00 MT
- Aluminium Windows of 100.00 Sqmts
- Industrial Flooring (M-15,CC with Metalic Harden Toping of 500 Sqmts)
- Supply Errection of angular truss span up to 10mts of 6mts.

SECTION 7: CONDITIONS OF CONTRACT

Clause 1. Security Deposit

(a) The person/persons whose tender may be accepted (hereinafter called the contractor which expression shall unless the context otherwise requires, include his heirs, executors, administrators and assigns) shall pay Earnest Money Deposit indicated in Column (ii) of the table given below and shall permit Institute (a) to deduct FSD at the percentage mentioned in Column (iii) of the table given below of all moneys payable for work done under the Contract, at the time of making such payments to him/them and (b) to hold such deductions as Further Security Deposit (FSD).

Estimated cost of the work	E.M.D Percentage	F.S.D Percentage
(i)	(ii)	(iii)
Up to Rs.20,00,000/-	2 ½%	5%
Rs.20,00,000/- up to Rs.1.00 Crore	2%	5 ½%
Rs.1.00 crore up to Rs.10 crores	1½%	6%
10 crores and above	1%	6 ½%

(b) Addition or Reduction in Security Deposit.

The EMD for the tendered work and additional amount of Security Deposit at the rates mentioned in Sub-clause 1(a) above should be, paid by the contractor. It a portion of the work is withdrawn from the Contractor under the provisions of Clause 12(a), the Project Engineer cum Estate Officer(CCMD), Indian Institute of Science(hereinafter referred to as the Project Engineer cum Estate Officer) may allow a proportionate reduction in the amount of the Security Deposit.

(c) Dues to Institute, to be set off against Security Deposit.

All compensation or other sums of money payable by the Contractor to Institute under the terms of this contract may be realized or deducted from any Security Deposit payable to him or from any sums which may be due or may become due by Institute to the Contractor on any account whatsoever and in the event of his security deposit being reduced by reason of any such realization or deduction as aforesaid, the Contractor shall, within ten days thereafter, make good in cash any sum or sums which have been deducted from, or raised by sale of his security deposit or any part thereof.

(d) Refund of Security Deposit (EMD & FSD):

The Security Deposit lodged/paid by a Contractor shall be refunded to him after the final bill is paid or after twelve months from the date of completion of the work, during which period the work should be maintained by the Contractor in good order, whichever is later.

Clause 2.PENALTY FOR DELAY

(a) Written Order to Commence Work

After acceptance of the tender, The Project Engineer cum Estate Officer, CCMD shall issue a written order to the successful tenderer to commence the work. The Contractor shall enter upon or commence any portion of work only with the written authority and instructions of The Project Engineer cum Estate Officer, CCMD. Without such instructions the Contractor shall have no claim to demand for measurements of or payment for, work done by him.

(b) Programme of work

The time allowed for carrying out the work as entered in the tender shall be strictly observed by the contractor. It shall be reckoned from the date of handing over the site to the Contractor not less than 75 percent of work site area comprising a continuous block. The work shall throughout the stipulated period of the contract be proceeded with, all due diligence (time being deemed to be the essence of the contract on the part of the Contractor). To ensure good progress during the execution of the work, the contractor shall be bound (in all cases in which the time allowed for any work exceeds one month) to comply with the time schedule according to the programme of execution of the work as agreed upon and enclosed to the agreement.

(c) Review of progress and responsibility for delay etc.,

The Project Engineer cum Estate Officer, CCMD shall review the progress of all works with the contractor during the first fortnight of every month. Such a review shall take into account the programme fixed for the previous month, obligations on the part of the Contractor.

(d) Apportioning of responsibility for delay between Contractor and

Institute.

In case the progress achieved falls short by more than 25 percent of the cumulative programme, the reasons for such shortfall shall be examined and a record made thereof apportioning the responsibilities for the delay

between the contractor and the Institute. This record should be signed in full and dated both by The Project Engineer cum Estate Officer, CCMD and the Contractor.

(e) Shortfall in progress made up subsequently.

To the extent the shortfall is assessed, as due to the delay on the part of the contractor, a notice shall be issued to him by The Project Engineer cum Estate Officer, CCMD to make up the shortfall . If the shortfall is not made up before the progress of the work is reviewed during the second month succeeding the month in which the shortfall was observed, the Contractor shall be liable to pay penalty as indicated in Clause 2(h) below.

(f) Settlement of dispute regarding shortfall in progress.

In case of dispute between The Project Engineer cum Estate Officer, CCMD and Contractor regarding the responsibility for the shortfall in progress, the matter shall be referred to the Director, IISc., who shall thereupon give a decision within fifteen days from the date of receipt of reference. The decision of the Director shall be final and binding on the contractor and The Project Engineer cum Estate Officer, CCMD.

(g) Penalty for delay

In respect of the shortfall in progress, assessed as due to the delay on the part of contractor as per Clause 2(b) and 2 (c), the contractor shall be liable to pay as penalty an amount equal to one percent of the estimated value of the balance work assessed according to the programme, for every week that the due quantity of work remains incomplete; provided always that the total amount of penalty to be paid under the provisions of this clause shall not exceed 7 ½ percent of the estimated cost of the entire work as shown in the tender, provided further that in the event of the contractor making up the shortfall in progress within the stipulated or extended time of completion, the penalty so recovered may be refunded on an application in writing by the contractor.

Note: If The Project Engineer cum Estate Officer, CCMD considers it necessary he shall be entitled to take action as indicated in Clause 3 (d) also.

(h) Adjustment of excess/over payments.

Excess/over payments as soon as they are discovered should be adjusted in the next running account bill of the contractor and in case the final bill has already been paid, the excess/over payment made shall be recovered from the Security Deposit of the contractor together with interest at such percentages as Institute may decide from time to time, from the date of such excess or over payment to the date of recovery.

Clause 3.ACTION WHEN WHOLE OF SECURITY DEPOSIT IS FORFEITED

In any case in which under any clause or clauses of this contract the contractor shall have rendered himself liable to pay compensation and/or penalty amounting to the whole of his security deposit including the amount deducted in installment from his bills as Further Security Deposit, The Project Engineer cum Estate Officer, CCMD on behalf of the Director, IISc., shall have power to adopt any of the following courses as he may deem best suited in the interest of Institute.

(a) Forfeiture of Security Deposit

Without prejudice to Institute's right to recover any loss from the Contractor under sub-clauses (b) and (c) of Clause 3 of the Contract, to rescind the contract (of which rescission notice in writing to the contractor under the hand of The Project Engineer cum Estate Officer, CCMD shall be conclusive evidence). And in that case, the security deposit of the contractor including whole or part of the lump sum deposited by him and also the amount deducted from his bills as Further Security Deposit, shall stand forfeited and be absolutely at the disposal of the Institute.

(b) Debiting cost of labour and materials supplied.

To employ labour paid by the Institute and to supply materials to carry out the work or any part of the work, debiting the contractor with the cost of the labour and the price of the materials (as to the correctness of which cost and price the certificate of the Project Engineer cum Estate Officer, CCMD shall be final and conclusive against the contractor) and crediting him with the value of the work done; in all respects in the same manner and at the same rates as if it had been carried out by the contractor under terms of this contract, and in that case the certificate of the Project Engineer cum Estate Officer, CCMD as to the value of the work done shall be final and conclusive against the contractor.

(c) Recovery of extra cost on unexecuted work

To measure up the work of the contractor and to take such part thereof as is remaining unexecuted out of his hands and to give it to another contractor to complete it in which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor, if the whole work had been executed by him (as to the amount of which excess expenses the certificate in writing of the Project Engineer cum Estate Officer, CCMD shall be final and conclusive) shall be borne and paid by the original contractor and shall be deducted from any money due to him by Institute under this contract.

(d) Action against unsatisfactory progress

If the contractor does not maintain the rate of progress as required under Clause 2 and if the progress of .any particular portion of work is unsatisfactory even after taking action under Clause 2(c) and 2(d), the Project Engineer cum Estate Officer, CCMD shall be entitled to take action under Clause 3(b) or 3(c) at his discretion in order to maintain the rate of progress after giving the contractor 10 days notice in writing whereupon the contractor will have no claim for any loss sustained by him owing to such actions.

(e) No compensation for loss sustained on advance action

In the event of any of the above courses being adopted by the Project Engineer cum Estate Officer, CCMD, the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased, or procured any materials, entered into any agreements or made any advances on account of, or with a view to the execution of the work or the performance of the contract. And in case the contract shall be rescinded under the provision aforesaid the contractor shall not be entitled to recover or be paid any sum for any work thereof actually performed by him under his contract, unless and until the Project Engineer cum Estate Officer, CCMD shall have certified in writing the performance of such work and the amount payable in respect thereof, and he shall only be entitled to be paid the amount so certified.

Clause 4. CONTRACTOR TO REMAIN LIABLE TO PAY COMPENSATION IFACTION IS NOTTAKEN UNDER CLAUSE-3.

(a) In any case in which any of the powers conferred upon the Project Engineer cum Estate Officer, CCMD by Clause 3 thereof shall have become exercisable and the same shall not have been 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 for which under any clause hereof he is declared liable to pay compensation or penalty amounting to the whole of his security deposit and the liability of the contractor for past and future compensation or penalty shall remain unaffected.

(b) Power to take possession of or require removal of or sell contractor's properties.

In the event of the Project Engineer cum Estate Officer, CCMD taking action under sub-clause (a) or (c) of Clause 3, he may, if he so desires, take possession of all or any tools, plant, materials and stores, in or upon works or the site thereof or belonging to the contractor, or procured by him 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 contract rates not being applicable, at current market rates, to be certified by the Project Engineer cum Estate Officer, CCMD whose certificate thereof shall be

final. In the alternative, the Project Engineer cum Estate Officer, CCMD may after giving notice in writing to the contractor or his clerk of the works, foreman or other authorized agent, require him to remove such tools, plant, materials or stores from the premises within a time to be specified in such notice; and in the event of the contractor, failing to comply with any such requisition, the Project Engineer cum Estate Officer, CCMD may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor and at his risk in all respect, and the certificate of the Project Engineer cum Estate Officer, CCMD as to the expense 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. GRANT OF EXTENSION OF TIME

(a) If the contractor shall desire an extension of the time for completion of the work, on the ground of his having been unavoidably hindered in its execution or on any other ground, he shall apply in writing to the Project Engineer cum Estate Officer, CCMD before the expiry of the period stipulated in the tender or before the expiry of 30 days from the date on which he was hindered as aforesaid or on which the cause for asking for extension occurred, whichever is earlier and the Project Engineer cum Estate Officer, CCMD or other competent authority may if in his opinion, there are reasonable grounds for granting an extension, grant such extension as he thinks necessary or proper. The decision of such competent authority in this matter shall be final.

(b) The time limit for completion of the work shall be extended commensurate with its increase in cost occasioned by alterations or additions and the certificate of the Project Engineer cum Estate Officer, CCMD or other competent authority as to such proportion shall be conclusive.

Clause 6. ISSUE OF FINAL CERTIFICATE – CONDITIONS REGARDING

(a)On completion of the work the contractor shall report in writing to the Project Engineer cum Estate Officer, CCMD the completion of the work. Then he shall be furnished with a certificate by the Project Engineer cum Estate Officer, CCMD of such completion, but no such certificate shall be given nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall have been executed, all scaffolding, surplus materials and rubbish, and shall have cleaned thoroughly all wood work, doors, windows, wall, floor or other parts of any building, in or upon which the work has been executed, or of which he may have had possession for the purpose of executing the work, nor until the works shall have been measured by the Project Engineer cum Estate Officer, CCMD or other competent

authority, or where the measurements have been taken by his Engineer-in-charge until they have received the approval of the Project Engineer cum Estate Officer, CCMD or other competent authority, the said measurements being binding and conclusive against the contractor. If the contractor shall fail to comply with the requirements of this clause as to the removal of scaffolding, surplus materials and rubbish, and cleaning on or before the date fixed for the completion of the work the Project Engineer cum Estate Officer, CCMD or other competent authority may, at the expense of the contractor, remove such scaffolding, surplus materials and rubbish, and dispose of the same as he think fit and clean off such dirt etc., as aforesaid and contractor shall be liable to pay the amount of all expenses incurred but shall have no claim in respect of any such scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.

(b) CLOSURE OF CONTRACT PENDING COMPLETION OF MINOR ITEMS.

In cases where it is not desirable to keep the building contract open for minor items, such as flooring in the bath rooms, etc., which can be carried out only after installation of sanitary work the main contract may be finalized after getting a supplementary agreement executed in the prescribed form by the same contractor for doing the residual work.

Clause 7. Contractor to submit bills monthly in printed form

(a) A bill shall be submitted by the contractor on or before 15th of each month for all items of work executed in the previous month as required by IISc.

(b) All bills shall be prepared in the prescribed printed or electronic form in PDF format in quadruplicate and handed over to the Engineer-in-charge in work/ the Project Engineer cum Estate Officer, charge of the CCMD's Office and acknowledgment obtained.

(c) The charges to be made in the bills shall always been entered at the rates Specified in the tender in full or in part as the case may be, in work the case of any extra ordered in pursuance of these or conditions, and not mention provided in the tender, the charges in the bills shall be at the rates hereinafter provided for such work

(d) Security of Bills and measurement of work

The details furnished by the Contractor in the bill should be completely scrutinized and the said work should be measured by the Engineer-in-charge in the presence of the Contractor or his duly authorized agent. The countersignature of the contractor or the said agent in the measurement book shall be sufficient proof to the correctness of the measurements, which shall be binding on the contractor in all respects. If the contractor does not submit the bills within the prescribed time, the Project Engineer cum Estate Officer, CCMD may depute within seven days of the prescribed date, an Engineer-in-charge to measure up the said work. The countersignature of the contractor shall be obtained in the Measurement Book concerned with reference to which the Institute may prepare the bill.

(e) Filing of objections to measurement by contractor

Before taking any measurement of any work as has been referred to in Clause 7(d) above the Project Engineer cum Estate Officer,CCMD or a Engineer-in-charge deputed by him shall give reasonable notice to the contractor. If the Contractor fails to attend at the measurements after such notice or fails to countersign or to the difference, within a week from the date of measurement in the manner required by the Project Engineer cum Estate Officer, CCMD, then in any such event, the measurements taken by the Project Engineer cum Estate Officer, CCMD or by the Engineer-in-charge deputed by him as the case may be, shall be final and binding on the contractor and the contractor shall have no right to dispute the same.

(f) One copy of the passed bill shall be given to the Contractor without any charge.

Clause 8. PAYMENT PROPORTIONATE TO WORK APPROVED ANDPASSED.

a) No payment shall be made for any work estimated to cost rupees five thousand or less until after the whole of the work shall have been completed and certificates of completion given. But in the case of works estimated to cost more than Rs. 5,000 the contractor shall on submitting the bill and after due verification by the Engineer-in-charge as per

Clause 7(d) entitled to necessary payment proportionate to the part of the work then approved and passed by The Project Engineer cum Estate Officer, CCMD or other competent authority whose certificate of such approval and passing of the sum so payable shall be final and conclusive against the contractor.

b) Payment at reduced rates

The rates for several items of works agreed to within shall be valid only when the items concerned are accepted as having been completed fully in accordance with the stipulated specifications. In cases where the items of work are not accepted as so completed, the Project Engineer cum Estate Officer, CCMD or other competent authority may make payment on account of such items at such reduced rates as he may consider reasonable in the preparation of final or on account bills.

c) Payment or intermediate certificates be regarded as advances:

All such intermediate payments shall be regarded as payments by way of advance against the final payments only and not as payments for work actually done and completed, and shall not preclude the Project Engineer cum Estate Officer, CCMD or other competent authority from requiring any bad, unsound imperfect or unskillful work to be removed or taken away and reconstructed or re-erected nor shall any such payment be considered.

As an admission for the due performance of the Contract or any part thereof in any respect or the accruing of any claim, nor shall it conclude determine or affect in any other way the powers of the Project Engineer cum Estate Officer, CCMD or other competent authority as to the final settlement and adjustment of the accounts, or otherwise or in any other way vary or affect the contract.

d) Submission of Final bill and its settlement

The contractor shall submit the final bill within one month of the date of actual completion of the work in all respects. His claims shall be settled (except those under dispute) within two months thereafter in respect of works costing up to Rs. 1 lakh and within five months thereafter in respect of works costing more than Rs. 2 lakhs.

e) Disputed items

Note: The contractor shall submit a list of the disputed items within 30 days from the disallowance thereof and if he fails to do this, his claim shall be deemed to have been fully waived and absolutely extinguished.

Clause 9. Definition of Work :

(a) The expression `Work' or 'Works' where used in these conditions, shall unless there be something in the subject or context repugnant to such construction, be construed to mean the work or works contracted to be executed under or in virtue of the contract, whether temporary or permanent and whether original, altered, substituted or additional.

(b) 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 sound and substantial and workmanlike manner, and in strict accordance with the specifications both as regards materials and workmanship. The contractor shall also conform exactly, fully and faithfully to the designs, drawings and instructions in writing relating to the work signed by the Project Engineer cum Estate Officer, CCMD or other competent authority and lodged in his office and to which the contractor shall be entitled to have access at such office, or on the site of the work for the purpose of inspection during office hours. The contractor shall also be responsible for the delivery of structure in sound conditions and the execution of the work strictly in accordance with the specifications of the work.

(c) Action where there is no specification

In the case of any class of work for which there is no such specification, then in such a case of the work shall be carried out in all respects in accordance with the instructions and requirements of the Project Engineer cum Estate Officer, CCMD or other competent authority.

(d) Work as per Specifications and IS Codes.

The detailed specification, which forms a part of contract, accompanies the tender document. In carrying out the various items of work as described in Schedule B of the tender documents and the additional, substituted, altered items of work these detailed specification shall be strictly adhered to, supplemented by relevant provisions of the Indian standard specifications, the code of practice; etc., The Indian standard specification and the code of practice to be followed shall be the latest versions of those listed in the detailed technical specifications. Any class of work, not covered by the detailed technical specifications, shall be executed in accordance with the instructions and requirements of the engineer and the relevant provisions of the Indian standard specifications.

Clause 10. Alteration in quantity of work, specifications and designs, Additional work, deletion of work

(a) The Project Engineer cum Estate Officer, CCMD shall have power to make any alternations in, omissions from additions to or substitutions for the original specification, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work. For that purpose or if for any other reason it shall in his opinion be desirable, he shall have power to order the Contractor to do and the contractor shall do any or all the following: -

(b) Increase or decrease the quantity of any work included in the contract.

(c) Omit any such work.

(d) Change the character or quality or kind of any such work,

(e) Change the levels, lines, positions and dimensions of any part of the work,

(f) Execute additional work of any kind necessary for the completion of the works and

(g) change in any specified sequence, methods or timing of construction of any part of the work.

10.a) Contractor bound by Project Engineer cum Estate Officer, CCMD's instructions

The Contractor shall be bound to carry out the work in accordance with any instructions in this connection which may be given to him in writing signed by the Project Engineer cum Estate Officer, CCMD or other competent authority and such alteration shall not in any way vitiate or invalidate the contract.

Orders for variations to be in writing

(i) No such variations shall be made by the Contractor without an order in writing of the Project Engineer cum Estate Officer provided that no order in writing shall be required for increase or decrease in the quantity of any work where such increase or decrease is the result of the quantities exceeding or being less than those stated in the 'Schedule B'
provided also that if for any reason the Project Engineer cum Estate Officer, CCMD shall consider it desirable to give any such order verbally, the Contractor shall comply with such order without any confirmation in writing of such verbal order given by the Project Engineer cum Estate Officer, CCMD, whether before or after the carrying out of the order, shall be deemed to be an order in writing within the meaning of the clause; provided further that if the Contractor shall within seven days confirm in writing to the Project Engineer cum Estate Officer, CCMD and if such confirmation is not contradicted in writing within fourteen days by the Project Engineer cum Estate Officer, CCMD, it shall be deemed to be an order in writing by the Project Engineer cum Estate Officer, CCMD.

(ii) Any additional work which the contractor may be directed to do in the manner above specified as part of the work shall be carried out by the Contractor on same conditions in all respects on which he agreed to do the main work and same rates as are specified in the tender for the main work. However, change in the unit rates tendered and accepted shall be considered in respect of items under which the quantity of work performed exceeds tendered quantity by more than 25 percent and this actual change in rate will be restricted only to such excess quantity (i.e. beyond 125 percent of the tendered quantity).

(b) Rates for additional, substituted, altered items of work

If the additional, substituted or altered work includes any class of work for which no rate is specified in the contract, then such work shall be carried out at the rates specified for or derived from similar item of work in the agreement. In the absence of similar items in agreement, rate shall be as specified for or derived from similar items in the schedule of rates of KPWD prevalent at the time of execution of such additional substituted or altered items of works, plus or minus the overall percentage of original tendered rates over the current schedule of rates of (KPWD) the year in which tender is accepted as mentioned in sub clause (b) above. With regard to the question whether the additional, substituted or altered item/items of work/works is / are similar or not, to that/those in the agreement / in the Schedule of Rates of KPWD and the decision of the Director shall be final and binding on the contractor.

(c) Determination of rates for items not found in Estimate or Schedule of Rates

If the rates for additional, substituted or altered work cannot be determined in the manner specified in sub clauses (b) and (c) above, then the contractor shall within 7 days of the date of receipt by him of

the order to carry out the work, inform The Project Engineer cum Estate Officer, CCMD of the rates which it is his intention to charge for such class or work, supported by analysis of the rate or rates claimed. Thereupon the Project Engineer cum Estate Officer, CCMD shall determine the rate or rates on the basis of observed data and failing this, on the basis of prevailing market rates. Under no circumstances the contractor shall suspend the work on the plea of non-settlement of rates for items falling under this clause. In the event of any dispute regarding the rates for such items the decision of the Director, IISC shall be final.

Clause 11. TIME LIMITS UNFORSEEN CLAIMS

Under no circumstances whatever shall the contractor be entitled to any compensation from Institute on any account unless the contractor shall have submitted claim in writing to the Project Engineer cum Estate Officer, CCMD or
other competent authority

Clause 12. NO CLAIM TO ANY PAYMENT OR COMPENSATION FORDELETION OF WHOLE OR PART OF WORK

a) If at any time after the execution of the contract document, the Project Engineer cum
Estate Officer, CCMD or other competent authority shall, for any reason whatsoever,
require the whole or any part of the work as specified in the tender, to be stopped for any period or require the whole or part of the work (i) not to be carried out at all or (ii) not to be carried out by the tendered contractor, he shall give notice in writing of the fact to the contractor who will thereupon suspend or stop the work totally or partially as the case may be. In any such case, except as provided hereunder, the contractor shall have no claim to any payment of compensation whatsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not so derive in consequence of the full amount of the work not having been carried out, or on account of any loss that he may be put on account of materials purchased or agreed to be purchased, or for unemployment of labour recruited by him. He shall not also have any claim for compensation by reason of any alterations having been made in the original specifications, drawings, designs and instructions, which may involve any curtailment of the work, as originally contemplated.

(b) Payment for materials already purchased or ordered by contractor.

Where, however, materials have already been purchased or agreed to be purchased by the contractor before receipt by him the said notice the contractor shall be paid for such materials, at the rates determined by the Project Engineer cum Estate Officer, CCMD or other competent authority provided they are not in excess of requirements and are of approved quality, and/or shall be compensated for the loss, if any, that he may be put to, in respect of materials agreed to be purchased by him, the amount of such compensation to be determined by the Project

Engineer cum Estate Officer, CCMD or other competent authority whose decision shall be final.

(c) Labour charges during stoppage of work

If the contractor suffers any loss on account of his having to pay labour charges during the period during which the stoppage of work has been ordered under this clause, the contractor shall on application, be entitled to such compensation on account of labour charges as the Project Engineer cum Estate Officer, CCMD or other competent authority, whose decision shall be final, may consider reasonable. Provided that the contractor shall not be entitled to any compensation on account of labour charges if in the opinion of the Project Engineer cum Estate Officer, CCMD or other competent authority, the labour could have been employed in the same locality by the contractor for the whole or part of the period during which the stoppage of the work has been ordered as aforesaid.

(d) Time limit for stoppage of work

The period of stoppage ordered by the Project Engineer cum Estate Officer, CCMD or other competent authority should not ordinarily exceed six months. Thereafter the portion of works stopped may be treated as deleted from this agreement if a notice in writing to that effect is given to the Project Engineer cum Estate Officer, CCMD or other competent authority by the contractor within seven days after the expiry of the above period.

(e) Execution of work deleted

The portion of work thus deleted may be got executed from the same contractor on supplemental agreement on mutually agreed rates, which shall not exceed current Schedule of Rates(KPWD) plus or minus tender percentage,

Clause 13. ACTION AND PENALTY IN CASE OF BAD WORK

If at any time before the security deposit is refunded to the contractor, it shall appear to the Project Engineer cum Estate Officer, CCMD or other competent authority that any work has been executed with unsound, imperfect or unskillful workmanship or with materials of inferior quality, or that any materials or articles provided by him for the execution of the work are unsound or of a quality inferior to that contracted for, or are otherwise not in accordance with the contract, it shall be lawful for the Project Engineer cum Estate Officer, CCMD or other competent authority to intimate this fact in writing to the contractor and then notwithstanding the fact that the work, materials or articles complained of may have been paid for, the contractor shall be bound forthwith to rectify, or remove and reconstruct the work so specified on whole or in part as the case may require, or if, so required shall remove the materials or articles at his own charge and cost and in the event of his failing to do so within a period to be specified by the Project Engineer cum Estate Officer, CCMD or the competent authority in the written intimation aforesaid, the contractor shall be liable to pay a penalty not exceeding one percent on the amount of the estimate for every day not exceeding ten days during which the failure, so continues and in the case of any such failure the Project Engineer cum Estate Officer, CCMD or other competent authority may rectify or remove, and re-execute the work or remove and replace the materia1s or articles complained of, as the case may be at the risk and expense in all respects of the contractor should valid reasons consider that the Project Engineer cum Estate Officer, CCMD or other competent authority for any
any such inferior work or materials as described above is to be accepted or made use of, it shall be within his discretion to accept the same at such reduced rates he may fix thereof.

Clause 14. WORK TO BE OPEN TO INSPECTION - CONTRACTOR OR RESPONSIBLEAGENT TO BE PRESENT

(a) All works under or in course of execution or executed in pursuance of the contract shall at all time be open to the inspection and supervision of the Project Engineer cum Estate Officer, CCMD or other competent authority and his Engineer-in-charge, and the contractor shall at all times during the usual working hours, and at all other times at which reasonable notice of the intention of the Project Engineer cum Estate Officer, CCMD or other competent authority Engineer-in-charge to visit the work shall have been given to the contractor, either himself

(b) be present to receive orders and instructions or have a responsible agent duly accredited in writing present for the purpose. Orders given to the contractor duly authorized agent shall be considered to have the same force and effect as if they had been given to the contractor himself.

(c) Employment of technical staff

The Contractor shall employ the following technical staff during execution of this work:

(i) One Graduate Engineer when the cost of the work to be executed is 'Rs. 5 lakhs or more',

(ii) One qualified Engineering Diploma Holder when the cost of work to be executed is more than Rs. 2 lakhs but less than Rs. 5 lakhs;

(iii) In addition to (i) and (ii) above, the contractor shall employ different types of such technical personnel as may be required and sufficient for execution of work and directed by the Project Engineer cum Estate Officer, CCMD to ensure efficient execution of work.

The technical staff so employed, should be available at site whenever required by Engineer in-charge to take instructions.

(c) If the contractor fails to employ the technical staff as aforesaid, he shall be liable to pay a sum of Rs. 10000 (Rupees TEN thousand only) for each month of default in the case of Graduate Engineers and Rs. 5000 (Rupees Five thousand only) for each month of default in case of Diploma Holders.

(d) If the Contractor himself possesses the required qualification and is available at the site for receiving instructions from the Project Engineer cum Estate Officer, CCMD and other competent authority vide sub-clause (a) above it will not be necessary for the technical staff to be available at site for receiving instructions.

Clause 15. NOTICE TO BE GIVEN BEFORE WORK IS COVERED UP

The contractor shall give not less than five days notice in writing to the Project Engineer cum Estate Officer, CCMD or his Engineer-in-charge in charge of the work before covering up or otherwise placing beyond the reach of the measurement any work in order that the same may be measured; and correct dimensions thereof taken before the same is so covered up or placed beyond the reach of measurement, and shall not cover up or place beyond the reach of measurement, and work without the consent in writing of the Project Engineer cum Estate Officer, CCMD or other competent authority or his Engineer-in-charge in charge of work; and if any work shall be covered up or placed beyond the reach of measurement, without such notice having been given or consent obtained, the same shall be uncovered at the contractor's expense, and in default thereof no payment or allowance shall be made for such work or for the materials with which the same was executed.

Clause 16. CONTRACTOR LIABLE FOR DAMAGE DONE, AND FORIMPERFECTIONS FORTWELVE MONTHS AFTER CERTIFICATE OF COMPLETION

If the Contractor or his workmen or servants shall break, deface, injure or destroy any part of a building in which they may be working, or any building, road fence, enclosure or grassland or cultivated ground contiguous to the premises on which the work or any part thereof is being executed, or if any damage shall be done to the work, while it is in progress from any cause whatever or if any imperfections become apparent in it within Twelve months of the grant of a certificate of completion, final or otherwise, by the Project Engineer cum Estate Officer, CCMD or other competent authority the contractor shall make good the same at his own expenses, or in default the Project Engineer cum Estate Officer, CCMD or other competent authority may cause the same to be made good by other workmen, and deduct the expenses (of which the certificate of the Project Engineer cum Estate Officer, CCMD or other competent authority shall be final) from any sums that may be due or may thereafter become due to the contractor, or from his Security Deposit or the proceeds of sale thereof, or of a sufficient portion thereof.

Clause 17. CONTRACTOR TO SUPPLY PLANT, LADDERS,SCAFFOLDINGS, ETC., AND ISLIABLE FOR DAMAGES ARISING FROM NON-PROVISION OF LIGHT, FENCING ETC

The contractor shall supply at his own cost all materials, plant, tools, appliance, implements, ladders, scaffolding, and temporary works required for the proper execution of the work whether in the original, altered or substituted form and whether included in the specification, or other documents forming part of the contract or referred to in these conditions or not, and which may be necessary for the purpose of satisfying or complying with the requirements of the Project Engineer cum Estate Officer, CCMD or other competent authority 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 in the measurement or examination at any time and from time to time of the work or the materials. Failing this, the same may be provided by the Project Engineer cum Estate Officer, CCMD or other competent authority at the expense of the contractor and expense may be deducted from any money due to the contractor under the contract or from his security deposit or the proceeds of sale thereof, or of a sufficient portion thereof. The contractor shall provide necessary fencing and lights required to protect the public from accident, and shall also be bound to bear the expense of defense of every other legal proceedings, that maybe brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and costs which may be awarded in any suit, action or

proceedings to any person, or which may with the consent of the contractor be paid for compromising any claim by any such person.

Clause 18. Measures for prevention of fire

The contractor shall not set fire to any standing jungle, trees, brushwood or grass without a written permit from the Project Engineer cum Estate Officer, CCMD. When such permission is given, and also in all cases when destroying cut or dug up trees, brushwood grass, etc., by fire the contractor shall take necessary measures to prevent such fire spreading to or otherwise damaging surrounding property.

Clause 19. Liability of contractor for any damages done in or outside Work Area.

Compensation for all damages done by contractor or his men whether in or beyond the limits of Institute property including any damage caused by spreading of fire mentioned in Clause 18 shall be estimated by the Project Engineer cum Estate Officer, CCMD and the estimate of the Project Engineer cum Estate Officer, CCMD, subject to the decision of the Director, IISc on appeal shall be final and the contractor shall be bound to pay the amount of the assessed compensation on demand failing which the same will be recovered from the contractor as the damages in the manner prescribed in clause 1(c) or deducted by the Project Engineer cum Estate Officer, CCMD or other competent authority from any sums that may be due or become due from Institute to the contractor under this contract or otherwise.

The contractor shall bear the expenses of defending any action or other legal proceedings that may be brought by any person for injury sustained by him owing to neglect of precautions to prevent the spread of fire and shall pay any damages and cost that may be awarded by the court in consequence.

Clause 20. EMPLOYMENT OF FEMALE LABOUR

The employment of female labourers on works in the neighborhood of soldier barracks should be avoided as far as possible.

Clause 21. Work on Notified Holiday

No work shall be done on any notified holiday without the sanction in writing of the Project Engineer cum Estate Officer, CCMD or other competent authority

Clause 22. WORK NOT TO BE SUBLET

(a) The contract shall not be assigned or sublet by the contractor,. However, any specific portion of the work which is of a specialised nature and normally not

executable by a general contractor could be got done by the specialised agencies which are executing
such works, after obtaining the specific approval of the Project Engineer cum Estate Officer, CCMD in writing in each case. Such consent to sublet the work, if given, shall not relieve the contractor from any liability or obligation under the contract and he shall be responsible for the acts, defaults and neglects of any sub-contractor or his agents, servants or workmate as fully as if they were the acts, defaults or neglects of the contractor, his agents, servants or workmen.

(b) Consequences of subletting work without approval, becoming insolvent, bribing etc., by contractor and action against the contractor.

If the contractor shall assign or sublet his contract or any portion thereof without the specific approval of the Project Engineer cum Estate Officer, CCMD or attempts to do so or become insolvent or commence any proceedings to get himself adjudicated as insolvent or make any composition with his creditors or attempts so to do or if any bribe, gratuity, or indirectly be given, promised or offered by the contractor or any of his servants or agents to any officer or person in the employ of Institute in any way relating to his office or employment or if any such officer or person in the employment or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Project Engineer cum Estate Officer, CCMD or other competent authority may thereupon by notice in writing rescind the contract and the security deposit of the contractor shall thereupon stand forfeited and be absolutely at the disposal of Institute and the same consequences shall ensure as if the contract had been rescinded under Clause 3 here of and in addition, the contractor shall not be entitled to recover or be paid for any work actually performed under contract.

(c) Recovery of excess payments based on excess measurements and action against contractor.

Whenever it is noticed that excess payments have been made to the contractor based on excess measurements recorded by the Engineer-in-charge in the measurement book and countersigned by the contractor or his duly authorised agent, action shall be taken to recover the excess payments together with interest immediately. Action may also be taken to remove the name of the contractor from the approved list of contractors and also to black-list him.

(d) Criminal proceedings against IISc Officers and Contractor for the lapses.

Institute also reserve the right to initiate criminal proceedings against the concerned Institute Officers who are directly responsible for the lapse and the contractors who have colluded with the officers of the Institute in the lapse and fraudulently received amounts not due to them legitimately.

Clause 23. SUM PAYABLE BY WAY OF COMPENSATION TO BE CONSIDERED AS REASONABLECOMPENSATION WITHOUT REFERENCE TOACTUAL LOSS.

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

Clause 24.SETTLEMENT OF DISPUTES -TIME LIMIT FOR DECISION

(a) If any dispute or difference of any kind whatsoever were to arise between the Project Engineer cum Estate Officer, CCMD and the contractor regarding the following matters namely,

(i) The meaning of the specifications designs, drawing and instructions herein before mentioned,

(ii) The quality of workmanship or materials used on the work and

(iii) Any other question, claim right, matter, thing whatsoever, in any way arising out of or relating to the contract, designs, drawings, specification, estimates, instructions, or orders, or those conditions, or failure to execute the same whether arising during the progress of the work, or after the completion, termination or abandonment thereof, the dispute shall, in the first place, be referred to the Director, IISc. The Director, IISc shall within a period of fifteen days from the date of being requested by the Contractor to do so give written notice of its decision to the Contractor.

(b) Time limit for notice to approach Court of law by contractor

If the Director has given written notice of his decision to the contractor and no written notice to approach the law court has been communicated to him by the contractor within a period of ninety days from receipt of such notice, the said decision of Director shall be final and binding upon the contractor

(c) Time limit for notice to approach law court by contractor when decision is not given by Director, IISc as at (b).

If the Director fails to give notice of his decision within a period of ninety days from the receipt of the contractor's request in writing for settlement of any dispute or difference as aforesaid, the Contractor may within ninety days after the expiry of the first named period of ninety days approach the Law Courts at Bangalore giving due notice to the Director.

(d) Contractor to execute and complete work pending settlement of dispute.

Whether the claim is referred to the Director or to the Law Courts, as the case may be, the contractor shall proceed to execute and complete the works with all due diligence pending settlement of the said dispute or differences.

(g) Obligations of The Project Engineer cum Estate Officer, CCMD and contractor shall remain unsettled during considerations of dispute.

The reference of any dispute or difference to the Director or the Law Court may proceed notwithstanding that the works shall then be or be alleged to be complete, provided always that the obligations of the Project Engineer cum Estate Officer, CCMD and the contractor shall not be altered by reason of the said dispute or difference being referred to the Director or the Law Court during the progress of the works.

Clause 25. CONTRACTOR TO PAY COMPENSATION UNDER WORKMEN'SCOMPENSATION ACT.

(a) The contractor shall be responsible for and shall pay any compensation to his own workmen payable under the relevant Workmen's Compensation Act for injuries caused to the workmen. If Institute pays such compensation on behalf of the contractor it shall be recoverable by Institute from the contractor under as per relevant clauses.

(b) Contractor to pay expenses of providing medical aid to workmen.

The contractor shall be responsible for and shall pay the expenses of providing medical aid to any workman who may suffer a bodily injury as a result of an accident. If Institute incurs such expenses, the same shall be recoverable from the contractor forthwith and be deducted without prejudice to any other remedy of Institute, from any amount due or that may become due to the contractor.

Clause 26. CONTRACTOR TO PROVIDE PERSONAL SAFETY EQUIPMENT FIRST AID APPARATUS, TREATMENT Etc

The contractor shall provide all necessary personal safety equipment and first aid apparatus for the use of the persons employed on the site and shall maintain the same in good condition suitable for immediate use, at any time and shall comply with the following regulations in connection therewith: -

(i) The worker will be required to use the equipment so provided by the contractor and the contractor shall take adequate steps to ensure proper use of the equipment by those concerned.

(ii) When work is carried on in proximity to any place where there is a risk of drowning; all necessary steps shall be taken for the prompt rescue of any person in danger.

(iii) Adequate provision shall be made for prompt first - aid treatment of all injuries likely to be sustained during the course of the work.

Clause 27. Minimum age of persons employed by contractor

(a): No contractor shall employ any person

(i) who is under age of 18 years.

(ii) Who does not produce a valid certificate of vaccination against smallpox in respect of himself/ herself as well as all the members of his/her family.

(b) The contractor shall provide potable water facilities to the workers. Similar amenities shall be provided to the workers engaged on large works in urban area.

(c) Removal of persons not satisfying conditions (a) (i) & (ii)

The Project Engineer cum Estate Officer, CCMD or other authority is authorised to direct the removal or to remove through - his own agency, from the work any person referred to in sub-clauses (a) above not satisfying these conditions and no responsibility shall be accepted by the Institute for any delay caused in the completion of the work by such directions for removal.

(d) Payment of fair and reasonable wages by contractor.

The contractor shall pay fair and reasonable wages, which shall not be less than the minimum wages fixed by Govt. of Karnataka from time to time to the workmen employed by him in the contract undertaken by him. In the event of any dispute arising between the contractor, and his workmen on the ground that the wages paid are not fair and reasonable the dispute shall be referred without delay to The Project Engineer cum Estate Officer, CCMD or other competent authority, who shall decide the same. The decision shall not in any way affect the conditions in the contract regarding the payment to be made by Institute at the agreed tender rates.

Clause 28.METHOD OF PAYMENT OF BILLS

Payment to contractors shall be made by cheques drawn by the Institute

Clause 29. SET OFF AGAINST ANY CLAIM OF INSTITUTE

Any sum of money due and payable to the contractor (including the security deposit refundable to him) under this contract may be appropriated by the Institute and set off against any claim of Institute in respect of a payment of a sum of money arising out of or under any other contract made by the contract with the Institute.

Clause 30.RATES INCLUSIVE OF ALL TAXES.

(a) The rates to be quoted by the contractor shall be inclusive of all taxes like GST etc., No extra payment on this account will be made to the contractor.

(b) All quarry fees, octroi dues levied by the state or any local body or authority and ground rent, if any, charged by the Project Engineer

(c) cum Estate Officer, CCMD for stacking materials should be paid by the contractor.

Clause 31.Refund of Security Deposit (EMD & FSD):

The Security Deposit lodged/paid by a Contractor shall be refunded to him after the final bill is paid or after TWELVE months from the date of completion of the work, during which period the work should be maintained by the Contractor in good order, whichever is later.

Clause 32.PENALTY FOR DELAY

(a) Written Order to Commence Work

After acceptance of the tender, The Project Engineer cum Estate Officer, CCMD shall issue a written order to the successful tenderer to commence the work. The Contractor shall enter upon or commence any portion of work only with the written authority and instructions of The Project Engineer cum Estate Officer, CCMD. Without such instructions the Contractor shall have no claim to demand for measurements of or payment for, work

(b) Programme of work

The time allowed for carrying out the work as entered in the tender shall be strictly observed by the contractor. It shall be reckoned from the date of handing over the site to the Contractor not less than 75 percent of work site area comprising a continuous block. The work shall throughout the stipulated period of the contract be proceeded with, all due diligence (time being deemed to be the essence of the contract on the part of the Contractor). To ensure good progress during the execution of the work, the contractor shall be bound (in all cases in which the time allowed for any work exceeds one month) to comply with the time schedule according to the programme of execution of the work as agreed upon and enclosed to the agreement.

(c) Review of progress and responsibility for delay etc.,

The Project Engineer cum Estate Officer, CCMD shall review the progress of all works with the contractor during the first fortnight of every month. Such a review shall take into account the programme fixed for the previous month, obligations on the part of the Contractor.

(d) Apportioning of responsibility for delay between Contractor and Institute.

In case the progress achieved falls short by more than 25 percent of the cumulative programme, the reasons for such shortfall shall be examined and a record made thereof apportioning the responsibilities for the delay between the contractor and the Institute. This record should be signed in full and dated both by The Project Engineer cum Estate Officer, CCMD and the Contractor.

Clause 33 BAR CHART / PERT CHART:

BAR chart /PERT chart shall be produced during agreement by the contractor . work According to the bar chart is to be executed otherwise penalty will be levied for the delay of work

BOQ

Sl.NO	Civil Works	Unit	Quantity
CIV1	Dismantling of existing structures like culverts, bridges and retaining walls and other structures compraising of masonry, cement concrete, wood work, steel work including T & P and scaffolding wherever necessary, sorting the dismantled materials, disposal of unserviceable materials, stacking the serviceable materials with all lifts and lead of 1000 metres complete as per specifications --do-- Dismantling brick work In cement mortar	Cum	35.00
CIV2	Dismantling of existing structures like culverts, bridges and retaining walls and other structures compraising of masonry, cement concrete, wood work, steel work including T & P and scaffolding wherever necessary, sorting the dismantled materials, disposal of unserviceable materials, stacking the serviceable materials with all lifts and lead of 1000 metres complete as per specifications cement concrete i. By manual means : b. Cement concrete M15 & M20	Cum	32.00
CIV3	Removing and relaying heavy duty cobble stones 60 mm thick interlock pavers, using cement and course sand for manufacture of blocks of approved size, shape and colour with a miniumum compressive strength of 281 kg per sqm over 50 mm thick sand bed (average thickness) and compacting with plate vibrator having 3 tons compaction force thereby forcing part of sand underneath to come up in between joints, final compaction of paver surface joints into its final level including cost of materials, labour and HOM of machineries complete as per specifications.	Sqm	300.00
CIV4	Dismantling of existing structures like R.C.C Cement concrete grade M20 & above and other structures compraising of masonry, cement concrete, wood work, steel work including T & P and scaffolding wherever necessary, sorting the dismantled materials, disposal of unserviceable materials, stacking the serviceable materials with all lifts and lead of 1000 metres complete as per specifications	Cum	5.00
CIV5	Dismantling mangalore tiles roof and stacking the material within a radius of 50 m. _do_ A.C sheet roofing.	Sqm	125.00
CIV6	Dismantling of Steel work in all types of sections up to a height of 5m above plinth level excluding cutting of rivet. a. Including	MT	5.00

	dismembering.		
(a)	Dismantling plastering and removing the debris with a lead upto 200m.	Sqm	50.00
(b)	Dismantling the tile work in floor and roof laid in cement or surki mortar including stacking the materials with in 50 m lead of tiles thickness 10 mm to 25 mm.	Sqm	50.00
CIV7	Dismantling of existing structures like Dismantling stone masonry b.Rubble masonry in cement mortar and retaining walls and other structures compraising of masonry, cement concrete, wood work, steel work including T & P and scaffolding wherever necessary, sorting the dismantled materials, disposal of unserviceable materials, stacking the serviceable materials with all lifts and lead of 1000 metres complete as per specifications	Cum	4.00
CIV8	Earthwork excavation for foundation of buildings, water supply, sanitary lines and electrical conduits either in pits or in trenches 1.5m and above in width, in hard soil not exceeding 1.5 m. in depth including dressing the bottom and sides of pits and trenches, stacking the excavated soil clear from edges of excavation with lead upto 50 m. after breaking of clods complete as per specifications.	Cum	275.00
CIV9	Refilling available earth around pipe lines, cables in layers not exceeding 20cms in depth, compacting each deposited layer by ramming after watering with lead up to 50m. and lift up to 1.5 m. including cost of all labour complete as per specifications allow 60% of rate considered under item	Cum	155.00
CIV10	Providing and laying in position plain cement concrete of mix M 7.5 with opc cement @180kgs with 40mm and down size graded granite metal coarse aggregates @0.85 cum and fine aggregates @ 0.57 cum machine mixed, concrete laid in layers not exceeding 15 cms. thick, well compacted, in foundation and plinth, including cost of all materials, labour, HOM of machinery, curing complete as per specifications.	Cum	70.00

CIV11	Providing and laying in position Reinforced cement concrete of design mix M20 with opc cement @320kgs with 20mm and down size graded granite metal coarse aggregates @0.878 cum and fine aggegates @ 0.459 cum with super plastisiser @3lts confirming to IS 9103-1999 reaffirmed -2008, machine mixed, concrete laid in layers not exceeding 15 cms. thick, vibrated for all works in foundation and plinth, and ground floor level for roof slabs ,stair case, lintles, retaining walls return walls, walls (any thick ness) including attached plasters ,coloums, piers, abutments, pillars, posts, struts, buttresses, string or lacing courses, parapets, coping, bed blocks anchor bolts, plain window cills, fillets, etc including cost of all materials, labour, HOM of machinery, curing complete as per specifications.	Cum	50.00
CIV12	Providing and laying in position Reinforced cement concrete of design mix M20 with opc cement @220kgs with 20mm and down size graded granite metal coarse aggregates @0.792 cum and fine aggregates @ 0.465 cum with super plastisiser @3lts confirming to IS 9103-1999 reaffirmed -2008, machine mixed, concrete laid in layers not exceeding 15 cms. thick, vibrated for all works in foundation and plinth, and ground floor level for roof slabs ,stair case, lintles, retaining walls return walls, walls (any thick ness) including attached plasters ,coloums, piers, abutments, pillars, posts, struts, buttresses, string or lacing courses ,parapets, coping, bed blocks anchor bolts, plain window cills, fillets, etc including cost of all materials, labour, HOM of machinery, curing complete as per specifications.	Cum	42.00
CIV13	Providing and removing centering, shuttering, strutting, propping etc., and removal of form work for flat surface such as suspended floors, roofs, landings, balconies and likes, thickness up to 200 mm including cost of all materials, labour complete as per specificaitons. do for 0 .6 mtrs	Sqm	275.00
CIV14	Providing TMT steel reinforcement for R.C.C work including straightening, cutting, bending, hooking, placing in position, lapping and / or welding wherever required, tying with binding wire and anchoring to the adjoining members wherever necessary complete as per design (laps, hooks and wastage shall not be measured and paid) cost of materials, labour, HOM of machinery complete as per specifications. -do- TMT Bars Fe 500	Tonne	11.50

CIV15	Providing and constructing burnt brick masonry with approved quality of non-modular bricks of standard size of class designation 50 (table moulded) with cement mortar 1:6 for basement and superstructure including cost of materials, labour charges, scaffolding, curing complete as per specifications.	Cum	40.00
CIV16	Providing and constructing granite / trap / basalt size stone masonry in foundation cement mortar 1:6, stone hammerd dressed in courses not less than 20 cms high, bond stones at two m. apart in each course including cost of materials, labour, curing complete as per specifications.	Cum	105.00
CIV17	Providing and laying in position plain cement concrete of mix M 15 with cement @240kgs with 20mm and down size graded granite metal coarse aggregates @0.878 cum and fine aggegates @ 0.459cum , machine mixed, concrete laid in layers not exceeding 15 cms. thick, well compacted, in foundation and plinth, including cost of all materials, labour, HOM of machinery, curing complete as per specifications.	Cum	15.00
CIV18	Charges towards removing and refixing of Existing M.S.Windows& Ventilators along with pigeon cage as per the instructions of user department and guidelines of Engineer -In-charge.(MR)	Nos	10.00
CIV19	Providing and constructing non load bearing wall with Light Weight Concrete (Auto Claved aerated Concrete)Blocks Confirming to IS:2185(Part-3) 1984 and IS 6441-1972 of Compressive strength of 3.0N/Sq MM with a thin layer of Polymer Based jointing solvent for super structure with necessary scaffolding, curing including cost of all materials, Labour, lead& Lift etc, Complete as per Specifications. -do- with 600x200x200mm size Blocks.	Sqm	40.00
CIV20	Providing and fixing in position anodized aluminium windows and ventilators as per approved drawings with sliding shutters using three track window frame of size 92x31.75mm bottom section 1.3mm thick, weight 1.07kg/m; sides and top sections 1.3 mm, thick, weight 0.933 kg/m.shutter frame section comprising top and bottom section of size 40mmx18mm, wall thickness 1.25mm. weight 0.417 kg./m. shutter side outer 40mmx18mm. wall thickness 1.25mm. weight 0.417 kg/m, shutter interlock section 40mmx26.7mm wall thickness 1.1 mm. thick, weight 0.469 kg/m, the shutters mounted on nylon rollers with approved quality of fixtures such as aluminium handles tower bolts etc.; providing and fixing 5.5mm. thick plain glass for shutters fitted with rubber beading all aluminium sections anodised 12 to 15 microns thick	Sqm	100.00

	including cutting to required length, joints mitred subdividing the frame tenonned and rivetted, in the assembled frame, stiffened with end clips for corners, angles etc., and fixed to the walls, lintels, floor beams/cills as the case may be, with necessary steel screws, raul plugs or teak wood gatties including cutting masonry or concrete and making good the original surface using cement mortar, do using aluminium sectio powered coated to aminimum of 60-70 microns with exterior durable pure polyester grade powder of approved quality		
CIV21	Providing, fabricating, assembling and fixing in position anodized aluminium doors using following aluminium mat finish or glossy finish, outer frame plain section 101.6x44.45mm thickness 3.18mm, section weight 2.404 kg/m, door shutters vertical section 44.62x44.45mm thickness 3.18mm, section weight 1.505kg/m, top section 47.62x44.45mm thickness 3.00mm, section weight 1.426kg/m bottom section 114.3x44.45 thickness 3.18mm, section weight 2.646kg/m, door central section 49.91x44.45mm thickness 3.00mm, section weight 1.495 kg/m glazing clips 19x17.3x11mm thickness 0.9mm section weight 0.124kg/m; aluminium sections anodized 12 to 15 microns cut to length joint metred corners grinded, the shutters pivoted opening arrangement with heavy duty aluminium alloy automatic door closures floor mounted, providing and fixing standard approved accessories, such as aluminium handle for full width or length, tower bolts, lock, pivots: P.V.C. or rubber gasket with 5.5m. thick plain glass for top and bottom panel; aluminium sections treated for removal of any rust and prevention of further rust formation, and coated with greasy materials for non-adherence of mortars or any other sticky materials; the assembled frame fitted with the corner angles, strips and fitted with screws, rawl plugs or teakwood gutties to R.C.C. columns or masonry on sides. beams and flooring in bottom. including cutting, chistling and making good with cement mortar to match the surface; all the frames thoroughly cleaned free from rust, scale, or dirt including cost of materials, fixtures, labour and HOM of machinery complete as per specifications. do using aluminium sectio powered coated to aminimum of 60-70 microns with exterior durable pure polyester grade powder of approved quality	Sqm	25.00
CIV22	Providing and fixing M.S.grill work for windows and ventilators weighing 21kg/sqm using M.S. flats, or M.S. square rods, or	Kgs	500.00

	combination of M.S. flats and square rods as per approved design, drawing including cutting steel sections and welding the same to required pattern with a coat of red lead primer, cost of materials, fixtures, labour and HOM of machinery complete as per specifications.		
CIV23	Providing and laying vitrified glazed tiles of approved make, quality &colour of size 600 x 600 x 10 mm thick fixed on bed of 12 thick cement mortar for flooring, skirting and jointed with neat cement slurry mixed with pigment to match shade of tiles, including providing spacers at required interval and removing stains etc., complete as per specifications.	Sqm	150.00
CIV24	Providing Ceramic tiles of approved make, shade and size for flooring, treads of steps and landings laid on a bed of 12mm thick, cement mortar 1:3 mix, flush pointing with white cement using colour pigment , including cost of materials, labour, curing, complete as per specifications. _do_ for Ceramic Tiles of size 30x30cms	Sqm	10.00
CIV25	Providing skirting, dado, rises of steps with colour glazed tiles 6mm thick on 10mm thick cement plaster 1:3 and jointed with white cement slurry over rough plaster surface (excluding cost of rough plastered surface which should be measured and paid separately) using glazed tiles of approved make and size including cost of materials, labour, complete as per specifications. colour glazed tiles 30x45cms 6mm thick with border of size 30x10cm	Sqm	50.00
CIV26	Providing and laying M-15 cement concrete flooring, 50 mm thick with metallic concrete hardner toping, under layer of 35mm thick m-15 cement concrete using broken granite metal of 20mm and down size, and top layer 50mm thick of metallic cement hardner consisting of mix 1:2 (1 cement hardner mix : 2 granite metal 10mm nominal size) by volume, with which metallic hardening compound of approved quality mix in the ratio of 4:1 (4 part of cement and 1 part of metallic floor hardening compound of approved quality by wt), including finishing cost of materials, labour, curing, complete as per specifications.	Sqm	500.00
CIV27	Providing water proofer capable of bridging cracks up to 2 mm in the exposed roof surface using spray applied liquid water proofer at the rate of 0.20 ltr/Sqm, primer and chemical mortar shall be applied before applying this spray liquid water proofer ,the area shall be cleaned by high pressure water jet/ wire bush or mechanical means to make it free from loose particles, dust ,dirt etc	Rmt	500.00

	_do_ for crack filling		
CIV28	Providing and fixing plaster mesh 200mm wide manufactured out of hot dipped galvanized iron of nominal thickness 0.35mm with a zinc coating of 120gms per sqm width, along route of walls chipped for services, junction between RCC and brick walls including cost of materials, labour for fixing complete as per specifications. (length of mesh only be measured for payment)	Mtr	500.00
CIV29	Providing and Laying reinforced cement concrete pipe NP2 for culverts including pointing ends, and fixing collars with cement mortar 1:2 including cost of all materials, labour, curing complete as per specifications. 300mm dia.	Rmt	75.00
CIV30	Providing 20mm thick cement plaster in single coat with cement mortar 1:3, to stone masonry including rounding off corners wherever required smooth rendering, : Providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications (Including Lime Rendering).	Sqm	250.00
CIV31(a)	Providing 18mm thick cement plaster in single coat with cement mortar 1:6 to brick masonry including rounding off corners wherever required smooth rendering, : Providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications	Sqm	725.00
(b)	Providing rough cement plastering 15mm thick in single coat with cement mortar 1:4, to brick masonry for base of dadooing works with sand of approved quality, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications	Sqm	50.00
CIV32	Providing applying two coats of wall putty to inside plastered walls and ceiling using white cement putty. Scrapping and levelling the surface using steel blade and preparing the surface even and smooth by using different grade sand papers, including cost of all materials, cost of labour and scaffolding etc., complete as per the specification.	Sqm	650.00
CIV33	Providing and applying two coats with oil bound washable distemper of approved brand and shade on wall surface including priming coat with distemper primer after thoroughly brooming the surface free from mortar drops and other foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour, complete as per specifications. (For Ceiling)	Sqm	400.00
CIV34	Providing and applying two coats with oil bound washable distemper of approved brand and shade on wall surface including priming coat	Sqm	750.00

	with distemper primer after thoroughly brooming the surface free from mortar drops and other foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour, complete as per specifications.		
CIV35	Providing & finishing external walls in two coats over one coat of 100% acrylic silicon glazed primer with antifungal paint for top coat of approved brand and shade to give an even shade after thoroughly brooming the surface to remove all dirt and loose powdered materials, free from mortar drops and other foreign matter cost of materials, labour complete and as per specifications.	Sqm	500.00
CIV36	Providing and applying enamel metal paint two coats (including priming coat) over new steel or other metal surface brushing to give an even shade after cleaning oil, grease, dirt and other foreign matter, including cost of materials, labour, complete as per specifications	Sqm	250.00
CIV37	Cost of hauling of materials by tipper excluding cost of loading and unloading and stacking complete as per specification	Cum	90.00
CIV38(a)	Providing and fixing Chorinated polyvinyl cloride (CPVC) Pipes conforming to IS 15778 having thermal stability for hot & cold water supply, including all CPVC plain and brass threaded fittings including fixing the pipe with clamp at 1.00m spacing this includes jointing of pipes and fittings with one step CPVC solvent cement and testing of joints complete (internal work exposed on wall) 32mm nominal OD pipes	Rmt	75.00
(b)	Providing and fixing Chorinated polyvinyl cloride (CPVC) Pipes conforming to IS 15778 having thermal stability for hot & cold water supply, including all CPVC plain and brass threaded fittings including fixing the pipe with clamp at 1.00m spacing this includes jointing of pipes and fittings with one step CPVC solvent cement and the cost of cutting chasis and making good the same including testing of joints complete (Concealed work including cutting chasis and good the walls etc) 20mm nominal OD pipes	Rmt	20.00
(c)	Providing and fixing Chorinated polyvinyl cloride (CPVC) Pipes conforming to IS 15778 having thermal stability for hot & cold water supply, including all CPVC plain and brass threaded fittings including fixing the pipe with clamp at 1.00m spacing this includes jointing of pipes and fittings with one step CPVC solvent cement trenching refilling and testing of joints complete (external works) 25mm nominal OD pipes	Rmt	25.00
CIV39	Providing and fixing Chorinated polyvinyl cloride (CPVC) Pipes	Rmt	75.00

	conforming to IS 15778 having thermal stability for hot & cold water supply, including all CPVC plain and brass threaded fittings including fixing the pipe with clamp at 1.00m spacing this includes jointing of pipes and fittings with one step CPVC solvent cement and testing of joints complete (internal work exposed on wall) 40mm nominal OD pipes		
CIV40	Providing and fixing Chorinated polyvinyl cloride (CPVC) Pipes conforming to IS 15778 having thermal stability for hot & cold water supply, including all CPVC plain and brass threaded fittings including fixing the pipe with clamp at 1.00m spacing this includes jointing of pipes and fittings with one step CPVC solvent cement and testing of joints complete (internal work exposed on wall) 50mm nominal OD pipes	Rmt	75.00
CIV41 (a)	Providing and fixing gun metal wheel valve conforming to IS specification of approved make as per directions including all lead and lift etc., complete. 32 mm dia	Nos	4.00
(b)	Providing and fixing gun metal wheel valve conforming to IS specification of approved make as per directions including all lead and lift etc., complete. 40 mm dia	Nos	5.00
(c)	Providing and fixing gun metal wheel valve conforming to IS specification of approved make as per directions including all lead and lift etc., complete. 50 mm dia	Nos	5.00
CIV42(a)	Providing and fixing in position 32mm nominal bore gun metal non-return valve horizontal type of approved make including cost of all materials, labour and HOM of equipments with all leads complete as per specifications.	Nos	4.00
(b)	Providing and fixing in position 40mm nominal bore gun metal non-return valve horizontal type of approved make including cost of all materials, labour and HOM of equipments with all leads complete as per specifications.	Nos	4.00
(c)	Providing and fixing in position 50mm nominal bore gun metal non-return valve horizontal type of approved make including cost of all materials, labour and HOM of equipments with all leads complete as per specifications.	Nos	5.00
CIV43	Fabricating supply and erecting M.S angular Truss of span up to 10m. The bottom and top member is provided with 50x50x6mm double equal angles, welded back to back and in-between top and bottom line in areas of mid section is provided with 50x50x6mm equal single angle for vertical and inclined members and supporting	Kgs	6000.00

	ends 40x40x5mm single angle is approved. All the members are welded together with 6mm gusset plate as per Drawing no CBS/SD/K-man tap/9/MND/97. The entire truss is anchored in RCC coloum by using 4nos of M.S angle bolts at each support, with 10mm thick base and shoe plate .The work includes cutting, straightening, placing in portion of M.S angle and welding whatever necessary and applying one coat of red oxide primer coat to all the members ,including cost of materials, labour charges and hire charges of machineries for cutting, welding, griding and erection equipments with all lead and lift, transportation etc, complete as per specification		
CIV44	Supply and fixing of 12mm dia -150mm long anchor bolts of approved make and quality along with drilling of holes in wall as well as in MS plates etc.	Nos	250.00
CIV45	Providing and fixing to wall, ceiling and floor, low density polyethylene pipes 6.00 kgf/sq.cm working pressure 160 mm outside diameter with special flange, compression type fittings, wall clips, making good the wall, ceiling and floor, including cost of all materials, labour charges, HOM of equipments and testing complete as per specifications.	Rmt	40.00
CIV46	Removing wall panelling / false ceiling / wooden partition / aluminium partition, stacking it with all cost and conveyance labour for all items of work, HOM of equipment etc., complete as per specification.	Sqm	100.00
CIV47	Providing polishing to existing Mosaic tiles flooring & skirting in three coats with suitable grinding stones using floor polishing machine and filling the gaps of tiles with grey cement mixed wih white Cement and should be cured for 3days then final coat of Polishing be done and finally wax mixed with petrol of coconut oil should be applied on tiles & Polishing with machine & Coir.	Sqm	130.00
CIV48	Providing & Fixing wooden partition with 50X50mm Sal wood frame work @600mm C/C in both ways, Providing & Fixing 6mm Ply wood of approved make and quality to partition frame work on both sides and providing and fixing 1mm thick decorative Laminate for (Existing Shade) Partition on both sides along with necessary accessories & Fixtures.	Sqmt	6.00
CIV49	Charges towards Removing and refixing of doors shutters along with frame including cost of hold fasts etc.	Nos	2.00
CIV50	Charges towards Removing of existing M.S Rolling Shutters Safely with damaging the cover, Guide rail and laths etc Complete.	Sqmt	30.00

CIV51	Charges towards removing, Altering to required size and refixing of existing rolling shutter along with necessary accessories and fixtures and providing and fixing motor for rolling shutter for easy operation.	Sqmt	15.00
CIV52	Providing and fixing white vitreous china clay, water closet European type (Pedestal type) with black solid plastic seat and lid, C.P brass hinges, rubber buffers. 10 litre low level, P.V.C flushing cistern (all are approved make) with fittings, C.I / M.S brackets, 40mm diameter flush bend with fittings and clamps, overflow arrangements with special and 25mm mosquito proof coupling of approved design, painting of fittings and brackets, cutting and making good the wall and floor wherever required, including cost of materials, labour complete as per specifications.	Nos	1.00
CIV53	Providing and fixing white vitreous china clay, water closet Orissa pattern of size 580 x 440mm with integral type footrests, 100mm S or P trap, 10 litre low level, P.V.C flushing cistern (all are approved make) with fittings, C.I / M.S brackets, 32mm diameter flush pipe fittings and clamps, overflow arrangements with special and 25mm mosquito proof coupling of approved design, painting of fittings and brackets, cutting and making good the wall and floor wherever required, including cost of materials, labour complete as per specifications.	Nos	1.00
CIV54	Providing and fixing white vitreous china clay, flat back wash basin size 550x400mm with a single 15mm C.P brass pillar tap with C.I / M.S brackets, 32 mm C.P. brass waste of standard pattern, painting of fittings and brackets, cutting and making good the wall and floor wherever required, including cost of materials, labour complete as per specifications.	Nos	1.00
CIV55	Providing and fixing 600x450mm bevel Lead edge mirror of superior glass with 6mm hard board backing and fixed to wooden cleats with C.P screws, washers, including cost of materials, labour complete as per specifications	Nos	1.00
CIV56	Providing and fixing C.P. brass towel rail 600 mm length, 20mm dia with C.P brackets, fixed to wooden cleats with C.P. brass screws including cost of materials, labour complete as per specifications.	Nos	2.00
CIV57	Supply and fixing white vitreous china clay large urinals of Hind ware/Parry ware make of size 580X380X350mm along with all necessary accessories and fixtures	Nos	2.00
CIV58	Providing and fixing jaguar make angle cocks along with C.P flagage and other necessary accessories as per the instructions of Engineer-	Nos	4.00

	In-Charge		
CIV59	Providing and fixing jaguar make 2in1 bibcock along with c.p flagageand other necessary accessories as per the instructions of Engineer-In-Charge	Nos	2.00
CIV60	Providing and fixing jaguar make long body bibcock along with c.p flagage and other necessary accessories as per the instructions of Engineer-In-Charge	Nos	1.00
CIV61	Providing and fixing jaguar make Pillar cock for hand wash basin along with c.p flagageand other necessary accessories as per the instructions of Engineer-In-Charge	Nos	1.00
CIV61	Providing and fixing Jaguar make Health Faucet along with the flexible c.p pipe of 600mm long body and other necessary accessories as per the instructions of Engineer-In-Charge	Nos	2.00
CIV62	Providing and fixing jaguar make urinal spreader, push cock, c.p waste coupling and waste pipe along with necessary accessories as per the instructions of Engineer-In-Charge	Sets	2.00
CIV63	Providing and installing of pre painted gal volume iron Trapezoidal profiled sheet of approved make 1060 mm width (1000 mm cover width), 28-30 mm crest height with crest distance of 200 mm c/c with 2 ribs at the centre for stiffening. The total coated thickness (TCT) of the sheet will be 0.47 mm+/- 0.02 mm tolerance zinc-Alu Alloy coating AZ150 gsm as per ASTM 1397/A755-550 mpa steel grade, 5-7 microns epoxy primer on both side of the seet and polyester top coat 20-22 microns using self drilling/self tapping screws of 25 mm length, to be fixed over the existing purlins, rafters, channels and trusses.	Sqm	22.00
CIV64	Providing and fabricated MS cover with doors for Electrical panel board using suitable MS sections for frame work along with bracing and providing and fixing 25X25X10G weld mesh for top panel and 3mm thick MS sheet for bottom panel including a coat of non corrosive red-lead Primer along with necessary accessories and fixtures.	Sqm	20.00
	Retaining wall works		
CIV65	Providing and removing centering, shuttering, strutting, propping etc., and removal of form work for flat surface such as suspended floors, roofs, landings, balconies and likes, thickness up to 200 mm including cost of all materials, labour complete as per specificaitons. do for 0 .6 mtrs	Sqm	65.00
CIV66	Providing 20mm thick cement plaster in single coat with cement	Sqm	65.00

	mortar 1:4, to stone masonry including rounding off corners wherever required smooth rendering, : Providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications.		
CIV67	Providing flush pointing to square rubble, course or uncoursed stone masonry with cement mortar 1:3, 20 mm deep, after raking joints to depth of 20 mm nicely lining, including cost of materials, labour, curing complete as per specifications.	Sqm	120.00
CIV68	Cost of hauling of materials by tipper excluding cost of loading and unloading and stacking complete as per specification	Cum	100.00
	ELECTRICAL		
	LED Fittings		
ELE1	Supplying of LED Floodlight with .....W System Power consumption pressure die cast aluminum housing with powder coating with IP 65 protection. 1, 200-275V voltage with electronic Driver, PF>0.9, should meet ANSI 2G Vibration test, Compliance to UL/CE with Class I. System rating shall be 50K hrs. @ Lumen maintenance of 70%, system efficacy > 80lm/w. Over load & Short circuit protection ensures reliable operation in spite of problem in output side. Compliance to IS 10322/IEC 60598, LM 79 & LM 80 Adherence with RoHS. UL approved MCPCB. Top access street light with single screw to ensure ease of maintenance at the sight site location with minimized minimal tools. LED Light fixture with .....W System Power consumption. LED Efficiency>130lm/w at 1W & Fixture Efficiency >80lm/w with nominal CRI >75. Luminaire manufacturer should have in-house facility accredited by NABL/CPRI & any Government certified agency & Design & Development facility certified by ISO 9001:2008. Housing with supplier word mark /name shall be Engraved / Embossing on the die cast housing/ Body part. Warranty of 5 Years against any manufacturing defect working under standard electrical conditions as mentioned above should be given by LED manufacturer.		
	LED Floodlight 100	Each	4.00
ELE2	Supplying of .....feet - PVC Batten with integrated LED tube ....W with high quality diffuser with Life of 25000 burning hours & 70% lumen maintenance with CRI > 80. Power Input: 220-240V @ 50/60Hz & Power factor >0.9 along with CE approved. 2 years Warranty against any manufacturing defect working under standard electrical condition.		

	LED light fighting 1 x4'- 20/22 w	Nos	75.00
ELE3	Supplying & fixing of retrofit type - LED bulb.....W with OPAL acrylic diffuser comprising of LED source with CCT 6500 degree K, CRI> 70%. efficacy >80 lumen per watt, life> 25000 burning hours and Compliance to IS 10322/IEC 60598, LM 79 & LM 80. The LED are driven by HF electronic driver integrated in the system, with PF > 0.95, power loss should < 5% of lamp wattage., short circuit & open circuit protection to be integrated in the circuit, THD less than 20%, Life as per LM 79. The operating input voltage should be between 130 to 275 volts. BIS Approved and Tested by NABL/CPRI accredited laboratory with 2 years Warranty against any manufacturing defect working under standard electrical condition.		
	9W, 6500K	Nos	105.00
ELE4	Supplying and fixing Moulded Case Circuit Breaker (MCCB) over the existing wood/panel board using necessary screws, bolts, nuts and wiring complete. Protection of Overload and Short circuit with thermal Magnetic/Micro processor release and Earth Fault as per IS-13947. (Icu = Ics)		
	FOUR POLE		
a	100Amps 25kA.	Each	10.00
b	125-160Amps 25kA.	Each	4.00
C	200Amps 35kA.	Each	2.00
d	250Amps 35k.	Each	2.00
e	320-400Amps 50kA.	Each	1.00
ELE5	Supplying and fixing regular MCCB distribution Panel confirming to IS 8828, on wall / wood board / flush mounting using required clamps, bolts, nuts etc., with provision for fixing of suitable type capacity MCCB's as an in comer for 3 phase Double door with necessary bus bar completely wired to use on 440Volts 3phase 4 wire powder coated painting etc., complete with a provision for fixing of single/three phase suitable capacity MCCB/MCB's as outgoings confirming to IS8828.		
a	4Way	Each	2.00
b	8Way	Each	2.00
c	12Way	Each	1.00
ELE6	Supplying and fixing miniature circuit breakers on existing MCB distribution boards using necessary fixing materials and 'C' Type curve, indicator ON/OFF, energy cross-3 with Short circuit breaking		

	capacity of 10K and complete wiring as required confirming to IEC 60898.		
a	5-32Amps SP	Each	55.00
b	5-32 Amps DP	Each	28.00
c	40-63Amps TPN	Each	6.00
ELE7	Supplying of on load change over switches 4 poles, AC-23A Duty, 415V, 50Hz, AC Supply.		
a	400Amps	Each	1.00
	Electrical Pannel		
ELE8	Fabricating supplying and mounting MS box made out ... SWG suitable for floor / wall mounting, fully weather proof with provision for better heat dissipation, provided with hinged front cover, equipped with tamper proof locking arrangements, with suitable size clamps with necessary cable entry pipe with gland and box should be finished with 2 coats of red oxide primer paint and finally finished with approved colour enameled metal paint etc., complete.		
a	16SWG	sq.cms	582251.00
ELE9	Supplying ..... amps rated 3phase with neutral bus bar using required capacity electrolytic aluminum strips covered with heat shrinkable coloured PVC sleeve, mounted on phenolic/FRP/DMC insulator which are mounted on powder coated 40x6mm M.S.flat frame work in existing panel board. The bus bar shall have suitable holes for termination of incoming and outgoing cables as per IS specification with necessary bolts, nuts and washers etc.		
a	100Amps 4x30x6mm Aluminum Strips	Mtr	12.00
b	250Amps 4x30x10mm Aluminum Strips	Mtr	12.00
c	400Amps 4x50x10mm Aluminum Strips	Mtr	15.00
ELE10	Supplying and fixing angle iron frame work fabricated out of M.S. angle iron.. and M.S. flat ... with bolts, washers etc., and painted with 2 coats of red oxide and then two coats of approved paint.		
a	50x50x6mm	Mtr	18.00
ELE11	Supplying of multi function digital meter with three line back light LCD type display for voltage, Current, frequency, Power, power factor, KVA, KWH,KVAR suitable for 3 phase, 4 wire LT network with IP 54 degree of protection and completely wired as required with communication Port and Class 0.5s accuracy.	Each	1.00
ELE12	Supplying, fixing and wiring 50/5 to 400/5Amps 5VA burden Current Transformer. Class 0.5 accuracy with Tape Wound	Each	3.00

ELE13	Supplying and fixing of LED type panel board indicating lamp with required colour suitable for 220v A.C. 50 Hz 12/24v D.C	Each	3.00
ELE14	Supplying and fixing of heavy duty cable glands suitable for UG cable of 1.1 KV class (metal only)		
a	32mm dia	Each	5.00
b	45mm dia	Each	7.00
c	50mm dia	Each	6.00
d	63mm dia	Each	5.00
e	75mm dia	Each	5.00
f	100mm dia	Each	2.00
ELE15	Supplying tinned copper lugs and crimping and wiring to terminal point for wire of the following sizes.		
a	50 sqmm Long Barrel	Each	20.00
b	70 sqmm Long Barrel	Each	22.00
c	95 sqmm Long Barrel	Each	18.00
d	120 sqmm Long Barrel	Each	20.00
e	150 sqmm Long Barrel	Each	20.00
f	185 sqmm Long Barrel	Each	15.00
g	240 sqmm Long Barrel	Each	15.00
	Earthing		
ELE16	Supplying fixing and wiring earth electrode for grounding of lifts, transformers, DG sets etc. using 40mm dia 2.9mm thick 2.5 mtr long GI pipe with GI funnel with mesh and suitable size reducer fixed on the top of the earth electrode. The funnel should be enclosed in a CC chamber of 400x400x400mm with a cast iron cover. The earth electrode shall have staggered holes of 12mm dia and the electrode should be covered 150mm all-round with alternate layers of salt and charcoal from the bottom of the CC chamber. The connection from the electrode is to be established through GI strip using GI bolts and nuts.	No	4.00
ELE17	Supplying and running GI/Copper conductor for grounding and (along with other wires in conduit system of wiring) using necessary suitable size clamps, nails, guttas/spacers etc.		
	Copper wire.		
a	8 SWG	Mtr	50.00
b	600x600x3mm plate	Each	4.00
	Under Ground Cables		
ELE18	Supplying of 1.1 KV LT UG cable having aluminum conductor PVC		

	insulated, extruded inner sheathed, galvanized, steel strip (except 2CX10Sq.mm wire armoured) confirming to IS-3975:1990 (No. of Strip indicated in GTP) & extruded PVC outer sheathed armoured cable with specified IS-1554 Part-1:1988 & confirming to GTP of GROUP-A.		
a	3.5 core 25 sqmm	Mtr	80.00
b	3.5 core 35 sqmm	Mtr	50.00
c	3.5 core 50 sqmm	Mtr	100.00
d	3.5 core 95 sqmm	Mtr	75.00
e	3.5 core 120 sqmm	Mtr	50.00
f	3.5 core 185 sqmm	Mtr	50.00
g	3.5 core 240 sqmm	Mtr	50.00
ELE19	Labour charges for laying of 1.1 KV class UG cable in existing trench GI pipe / stoneware pipe / on wall / on pole as required. In existing trench/duct.		
a	25 sqmm to 75 sqmm	Mtr	230.00
b	95 sqmm to150Sqmm	Mtr	125.00
c	185sqmm to 240Sqmm	Mtr	100.00
ELE20	Supplying and making straight through cable joint with epoxy resin including ferrules and other jointing materials for PVC insulated and PVC sheathed steel tape, wire armoured aluminum conductor cable of 1.1 KV grade of the following sizes.		
a	3 ½ x35 sqmm	Per Kit	6.00
b	3 ½ x50 sqmm	Per Kit	12.00
c	3 ½ x70/95 sqmm	Per Kit	6.00
d	3 ½ x120 /150 sqmm	Per Kit	18.00
e	3 ½ x185/225 sqmm	Per Kit	4.00
f	3 ½ x240 sqmm	Per Kit	4.00
ELE21	Supplying and fixing 2mm thick perforated cable tray with powder coated paint on existing MS angle support using necessary GI bolts/nuts and washer or welding as required.		
a	300x50mm	Mtr	120.00
b	450x50mm	Mtr	50.00
	Internal Wiring & Accessories		
ELE22	Wiring for lighting/power circuit using one of FRLS PVC insulated 1100V grade, multistrand Copper with low conductor resistance single core wire in open or concealed system of wiring with specified IS-694:1990 & confirming to GTP of GROUP -A		

a	2.5 sqmm	Mtr.	1800.00
b	4 sqmm	Mtr.	2000.00
c	6 sqmm	Mtr.	1500.00
d	10 sqmm	Mtr.	1200.00
e	16 sqmm	Mtr.	800.00
ELE23	Supplying capacitor type ceiling fan complete with down rod blades, shackle, canopies etc., for operation on 230 volts, 50 cycles. Single phase AC supply conforming to ISS-374-1979 and with double ball bearing system.		
	48" Sweep (1200mm)		
a	Regular model	Each	15.00
ELE24	Fixing a ceiling / wall mounting fan of all capacities and all types, with necessary clamps and 'S' hook made out of 15mm dia MS rod, with 5 amps. ceiling rose of approved quality with necessary length of 23 / 0.0076 inch PVC insulated twin twisted wire of approved quality, mounted on a suitable size wooden board and wired.	Each	15.00
ELE25	Supplying of 1440rpm heavy duty exhaust fan with bracket blades suitable to operate on 230V 50Hz, AC Supply complete.		
a	12" Sweep (300mm)	Each	20.00
ELE26	Fixing one exhaust fan in the nitch already left in the wall with bolts and nuts and 5 amps. ceiling rose with sufficient length of 23 / 0.0076 inch PVC insulated twin core wire.	Each	20.00
ELE27	Fixing all types and all capacities of fluorescent / false ceiling / spot light / CFL / LED fittings indoor on the wall / ceiling / rafters / girders using 23/0.0076” twin twisted PVC insulated wires, required Nos of round blocks and clamps.		
a	On wall / ceiling / Rafter / Girders	Each	40.00
ELE28	Supplying heavy gauge PVC conduit pipe …….dia …….mm thick confirming to IS 2509 with suitable size bends, junction boxes, adhesive paste etc., and fixing using inverted wood plugs in case of RCC ceiling and RCC wall / stone structure or rawl plugs in case of brick walls and cement plastering the damaged portion using heavy gauge saddles at an interval of 700mm using NF screws.		
a	19/20mm dia 2mm thick	Mtr	850.00
b	25mm dia 2mm thick	Mtr	900.00
ELE29	Supplying and fixing sheet metal box made out of 18 SWG sheet metal with necessary holes for cable/conduit entry as required with one coat of primer of approved make etc.		

a	75x75x65mm	Each	20.00
b	100x75x65mm	Each	15.00
c	135x75x65mm	Each	25.00
d	180x90x65mm	Each	12.00
e	200x90x65mm	Each	12.00
f	135x160x65mm	Each	10.00
g	200x200x65mm	Each	10.00
ELE30	Supplying and fixing PVC/metal conduit Deep junction box		
a	19/20mm deep junction box	Each	40.00
b	25mm deep junction box	Each	40.00
ELE31	Extra for Groove cutting in brick wall/CC floor to the suitable depth for concealing of Conduit/GI pipe and plastering, finishing up to wall surface complete.		
a	Up to 50mm conduit in brick wall	Mtr	450.00
ELE32	Supplying and fixing of PVC casing and capping on the wall or ceiling using necessary materials like bends, screws at an interval of 300mm …. etc. as required.		
a	20mm	Mtr	50.00
b	25mm	Mtr	50.00
ELE33	Supplying And Fixing "S" Hook made out of 14mm dia M.S.Rod.	No	15.00
ELE34	Supplying And Fixing M.S. Rafter Clamp Set made out of M.S. Flat & 14mm M.S. rod.	No	15.00
ELE35	Supplying And Fixing Metal Fan Box with Round Hook.	No	15.00
ELE36	Supplying and wiring adopting loop system in existing PVC Conduit / casing capping using 1100V grade, COPPER conductor flexible multistrand FRLS PVC insulated, 2 X1.5Sq.mm Cable confirming to the GTP, with a 6Amps flush type SP control switch shall be fixed on the existing plastic sheet / gang box, the other end of the wires shall be terminated with sufficient loose length in a wood/PVC round block. complete for each outlet.		
	GROUP A		
a	Short point up to 3Mtr from tapping point to out let via switch	Point	35.00
b	Medium point above 3Mtr up to 6Mtr from tapping point to out let via switch	Point	25.00
c	Long point above 6Mtr up to 10Mtr from tapping point to out let via switch	Point	20.00
ELE37	Supplying and flush mounting powder coated / galvanized metal		

	box suitable for mounting modular switch plates. The box should be firmly flush mounted after due groove cutting in Brick/Stone/C.C wall		
a	1-3Way	Each	44.00
b	4-5Way	Each	20.00
c	6Way	Each	27.00
d	8Way	Each	18.00
e	10-12Way	Each	10.00
ELE38	Supplying and fixing superior quality modular switch mounting polycarbonate plate with necessary supporting back plate with required nos. of machine screws, bolts nuts etc., complete on the existing metal/PVC box.		
a	1 to 3 Module	Each	44.00
b	4 Module	Each	20.00
c	6 Module	Each	27.00
d	8 Module	Each	18.00
e	10 Module	Each	5.00
f	l2 module	Each	5.00
ELE39	Supplying and fixing of modular switch/ Socket/stepped electronic fan regulator/ dimmer/telephone socket etc on existing modular switch plate as per IS 3854 and IS 1293		
	GROUP A		
a	6Amps one way.	Each	150.00
b	6Amps Two way.	Each	6.00
c	6Amps 3way socket	Each	60.00
d	Stepped Fan Regulator.	Each	15.00
e	16Amps one way switch	Each	20.00
f	32Amps DP switch	Each	20.00
g	6/16Amps universal socket	Each	20.00
h	TV/Telephone socket	Each	15.00
i	RJ45/ I.O. outlet	Each	15.00
ELE40	Supplying 4mm thick plastic sheet with necessary nitches for fixing switches, regulators etc., and fixing on existing wooden or metal box using N.F. screws.	Sqcm	15000.00
	Supplying and fixing of metal clad industrial plugs and sockets.		
	PLUG		
	3pole+earth 440V		

a	20 Amps	Each	18.00
b	30 Amps	Each	10.00
	SOCKET		
	3pole+earth 440V		
c	20 Amps	Each	18.00
d	30 Amps	Each	10.00
	NETWORKING & TELECOMUNICATION		
ELE41	Supplying and drawing UTP-CAT 6E LAN cable.	Mt.	450.00
ELE42	Supplying and drawing PVC flexible one pair telephone un armoured tinned copper cable.		
a	2Pair	RMt.	200.00
ELE43	Supplying and drawing PVC insulated gas injected physical foam jelly flooded co-axial TV cable.RG-6	RMt.	50.00
	Supplying & Fixing of switch mounting rack with power manager & Cable manager .		
ELE44	24U with 650mm depth	Each	1.00