TENDER DOCUMENT

(e-Procurement)

Tender No: IISc/Tender-ELE-04/2024-25

For

Providing 6 Nos Capacity Passenger Lift including all civil and Electrical works at Hoyasala Guest House

Office of the Project Engineer cum Estate officer

Centre for Campus Management and Development Indian Institute of Science

Indian Institute of Science Bangalore – 560012

080-2293-2202/2008

Website :https://iisc.ac.in/all-tenders/

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1. **Tender Notification**

Tender No: IISc/Tender-ELE-04/2024-25

Name of work	Providing 6 Nos Capacity Passenger Lift including all civil and Electrical works at Hoyasala Guest House at IISc Bangalore
Estimated Value of work	**Rs.29,93,238.71**
Period of Work Completion	**4 Months**
Name of the Client	Indian Institute of Science, Bangalore
Address of the Client	The Registrar Indian Institute of Science Bangalore – 560 012 Tel No. 080-2293 2008/2202 e-mail: office.ccmd@iisc.ac.in
Submission of Tender Document	e-procurement portal- https://eprocure.gov.in/eprocure/app Helpline no: 0120-4001005
Earnest Money to be deposited with the Tender	**Rs.59,864.77** (2% of the Estimated Cost)
Last date and Time for online submission (uploading) of tender	**08.01.2025 at 1530Hrs**
Date and Time of opening of Tender (Technical Bid)	**09.01.2025 at 1530Hrs**
Date and Time of opening of Tender (Financial Bid)	Shall be intimated to technically qualified bidders thro' CPP portal.
Pre-bid meeting Date, Time & Venue	**26.12.2024 at 1530Hrs** Pre bid meeting will be held on Teams App. The web link will be forwarded to the intending bidders. They are requested to send the request to the email id: office.ccmd@iisc.ac.in **Queries can be mailed in prior to the same mail.**

2.Notice Inviting Tender

The Registrar, Indian Institute of Science invites tenders in two bids (Technical and Financial) system from eligible Bidders, for **"Providing 6 Nos Capacity Passenger Lift including all civil and Electrical works at Hoyasala Guest House at IISc Bangalore"**

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).Tenders from Joint ventures are not acceptable.

2.1 All Bidders shall provide the required information accurately and enough as per details in Section 4:Eligibility Criteria

2.2 The Tenderer shall upload the valid copies of the documents as mentioned in the Chapter-4 (Eligibility criteria) in technical bid**, failing which the tender will be rejected**. If necessary, bidder shall produce all the original documents for verification.

2.3 The work shall be carried out as per the directions of the Project Engineer cum Estate Officer.

2.4 Blacklisted contractors inState / Central Govt. Departments / BBMP / PSU/ Central PSUs/ Autonomous bodies / Institutions are not eligible to quote, if found such tenders will be rejected.

2.5 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.

2.6 The material shall be got approved by the Project Engineer cum Estate Officer, IISc before execution of the work.

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

2.8 The rates quoted should reflect all taxes. The bid evaluation will be done inclusive of all Taxes / Cess. / Royalty etc. The statutory levies as per Govt. guidelines will be deducted. The IISc reserves the right to accept / reject any or all the tenders without assigning any reasons.

2.9 The work shall be commenced with all manpower, material, machinery & requisite resources within 10 days from the date of workorder, failing which it would be presumed that the successful tenderer is not 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.

2.10 Conditional tenders will not be accepted and is liable for rejection.

2.11 Bidders who meet the specified minimum qualifying criteria, shall be eligible.

2.12 Even though the Bidders meet the eligibility criteria mentioned in Section-4 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.

2.15 Site visit:

The Bidder at his own responsibility is encouraged to visit and examine the Site of Works and 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.

2.16 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. The bidders are advised to visit e-procurement portal and get familiarized with the procedure for submission of the tenders.

2.17 **Content of Tender documents**

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

2.18 Amendment of Tender documents

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

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

Prospective Bidders will be given reasonable time for submitting the bid by taking the corrigendum/ addendum into account.

2.19 Documents comprising the Tender

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

a) Earnest Money Deposit paid in the specified form as mentioned in the 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.

The bidder shall submit the hard copies of the documents / credentials which are uploaded in the tender portal. The documents shall reach the designated office within 3 days from the tender opening date.

The Financial bid shall be submitted by the bidder through e-procurement portal only and no hardcopy of financial bid should be attached or disclosed.

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

All prevailing duties, taxes, and other levies like CESS/Royalty 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.

2.20 Tender validity

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.

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 2.18 and 2.22 in all respects.

2.21 Earnest money deposit:

The Bidder shall furnish, as part of his tender, earnest money deposit (EMD). The Bidder has to pay the Earnest Money Deposit (EMD) in the form of Demand draft drawn on "The Registrar, IISc" payable at "Bangalore".

The bidder has to scan the demand draft and submit it with Technical Bid Documents for our reference. The original DDs has to be submitted along with the hard copies of all the documents in a sealed cover as a pre-qualification bid (Technical bid) which were uploaded through e-procurement portal.

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

a) The entire amount must be paid in a single transaction.
b) The earnest money deposit of unsuccessful Bidders will be returned after awarding the contract to the successful bidder.

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

2.22 Provisions for Micro and Small Enterprises (MSE):

The MSE registered bidder should upload the registration certificate in the CPP portal along with the technical bid documents. The MSE registration to specify manufacturing / service of the tender item(s).

Policy is meant for procurement of only goods produced and services rendered by MSEs. However, traders are excluded from the purview of Public Procurement Policy.

Participating Micro and Small Enterprises quoting price within price band of L1+15%, will qualify to supply a portion of requirement by bringing down price to L1 price in a situation where L1 price is from someone other than a Micro and Small Enterprises.

2.23 Format and signing of Tender

Successful Bidder shall sign all the pages of the tender document as a token of acceptance of all the terms and conditions of the contract.

2.24 Submission of Tenders

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

2.25 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 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.

2.26 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.

2.27 Modification and Withdrawal of Tenders

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.

The Bidder may withdraw his tender before the notified last date and time of tender submission. No Tender may be modified after the deadline for submission of Tenders.

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 2.21 above may result in the forfeiture of the earnest money deposit.

2.28 **Tender Opening:**

The IISc will open all the Tenders received through' online mode, 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.

The IISc will evaluate and determine whether each tender meets the minimum qualification eligibility criteria.

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. The IISc will record the Tender opening.

2.29 Process to be confidential.

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.

2.30 Clarification of Tenders

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 bye-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.

Subject to clause 2.29, 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/she should do so in writing.

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

2.31 **Examination of Tenders and determination of responsiveness**

Prior to the detailed evaluation of Tenders, the IISc will determine whether each Tender (a) meets the eligibility criteria (b) is accompanied by the required earnest money deposit and; (c) is substantially responsive to the requirements of the Tender documents.

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.

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.

2.32 Correction of errors

No corrections to uploaded bid is permitted by the portal. Tenders determined to be substantially responsive will be checked by IISc.

2.33 **Evaluation and comparison of Tenders**

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 Prequalification 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 the Tenders asper comparative statement downloaded from e-procurement portal.

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 and

b) Making appropriate adjustments to reflect discounts or other price modifications offered

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.

2.34 Negotiations

The Bidder though technically qualified and whose financial offer is the lowest, fails to convince the Tender Evaluation Committee of his capability, capacity, credibility, his offer may be reviewed, and the Bidder intimated accordingly. In such case, the Bidder, who has quoted the lowest price, may be considered and his price may be negotiated as advised by the tender committee.

2.35 Award criteria

Subject to Clause 2.36, 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. After technical evaluation the technically qualified bidders will be considered for opening of the financial bids provided that such Bidder has been determined to be eligible in accordance with the provisions of this tender document and subsequent technical clarifications offered by the responsive bidders.

2.36 Right to accept any Tender and to reject any or all Tenders

Notwithstanding Clause 2.35, 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.

2.37 Notification of award and signing of Agreement

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").

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 2.39

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.

Upon the furnishing by the successful Bidder of the Security deposit, the IISc will issue formal work order.

The successful bidder is required to sign an agreement for the due fulfilment 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 will be forfeited and at the absolute disposal of the Employer if the Contractor defaults from signing the Agreement of in starting the work.

2.38 Security deposit (SD)

Further percentage on the running bills and final bill in addition to Earnest Money Deposit shall be levied from the contractor. When the SD 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/Scheduled bank only for an equal amount in the prescribed form. The bank guarantee should be valid till the completion of the defect liability period.

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.

Failure of the successful Bidder to comply with the requirements of clause 2.38 shall constitute sufficient grounds for cancellation of the award and forfeiture of the earnest money deposit.

2.39 Corrupt or Fraudulent practices

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 a 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.

2.40 Payment Terms

For Civil works: Monthly running account bills.

For Electrical works: 80% against the supply of material and 10% after installation and 10% after testing and commissioning, subject to the other provisions of the tender document.

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

2.42 <u>Make in India</u>

Only "Class–I and Class-II local supplier will be eligible to bid notified vide (DPIIT) Notification No. P-45021/2/2017-PP (BE-II) dated 4th June 2020 amended from time to time.

3.Declaration of Tenderer

Name of Work: "Providing 6 Nos Capacity Passenger Lift including all civil and Electrical works at Hoyasala Guest House at IISc Bangalore"

3.1 I/We, declare that specifications, plans, designs and conditions of contract on which the rates have been quoted are completely studied by me/us before submitting this tender.

3.2 I/We declare that I/We have inspected the work spot and have made myself/ourselves thoroughly conversant and satisfied as regards the field conditions prevalent there, regarding the materials, labour and the particulars of various leads with which the materials required to be brought for the work.

3.3 I/We, declare that the rates quoted for items of works for which now tenders are called for are inclusive of leads with which I/We propose to bring the materials. I/We will not have any claims for higher leads, and my/our quoted rates are with all leads and lifts etc.,

3.4 I/We, declare that the rates tendered by me/us for this work have not been witnessed by any other contractor/s who has/have tendered for this work.

3.5 I/We, declare that I/We, have understood all the conditions mentioned above and also the specifications stipulated in tender condition either by going through myself/ourselves or by getting translated into my/our own mother tongue.

4.**Eligibility Criteria**

Technical Criteria:

4.1–Any specialised firms company registered under KPWD /CPWD/ railways/ MES/ central PSUs/ or any Government department of **Class I/Class A Electrical Contractors** are eligible to apply.

4.2The Bidder should have Experience of having a successfully completed either of the following works:

(a) Three (03) completed works each costing not less than **40%** (forty percent) of the estimated cost i.e. **Rs.11,97,295.48**

(Or)

(b) Two (02) completed works each costing not less than **60%** (Sixty percent) of the estimated cost i.e. **Rs.17,95,943.22**

(Or)

(c) One (01) completed works each costing not less than **80%** (Eighty percent) of the estimated cost i.e. **Rs.23,94,590.96**

4.3 The works should have been completed in last seven (7) consecutive years.

Note: The Experience certificate / work order should be in the same registered name as per Clause 4.1 and not as a joint venture.

Financial Criteria:

4.3The bidder should have registered for a minimum period of Ten years.

4.4The average annual financial gross turnover should be **30%** of estimated cost in that last five years.

4.5The minimum annual financial turnover for the two consecutive years should be **30%** of estimated cost.

4.6The bidder should have not incurred any loss in more than two years. The bidder should submit the **solvency certificate** from the bank for 30% of estimated cost. The Solvency should not be more than Six-month-Old ending last day of the month, previous to the month in which tender is invited.

4.7The average net worth of the bidder as of **2023-24** should be not less than 25% of estimated cost. Necessary certificate by the Charted Accountant shall be submitted.

4.8The bidder should have not been blacklisted by any State / Central Govt. Departments / BBMP / PSU/ Central PSUs/ Autonomous bodies / Institutions.

4.9The bidding capacity of the bidder should be 75% or more of the estimated cost.

The bidder should possess the bidding capacity as calculated by the following formula.

Available bid capacity = A x M x N -B, where

A = Maximum value of engineering (Civil/ Electrical/ Mechanical as relevant to work being procured)works executed in any one year during the last five years(updated at the current price level), taking into account the completed as well as works in progress.

M = Multiplier Factor (usually 1.5)

N = Number of years prescribed for completion of the work in question.

B = Value (updated at the current price level) of the existing commitments and ongoing works to be completed in the next 'N' years.

4.10 Information on works for which tenders have been submitted and ongoing works as on the date of this Tender.

(A) Existing commitments and on-going works:

Description ofwork	Place & State	Contract number & date	Name & address ofthe customer	Value of Contract in Lakhs	Stipulated period of completion	Value of work remaining to be completed in Lakhs	Anticipated date of completion
1	2	3	4	5	6	7	8

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

(B) Works for which Tenderers already completed:

Description of work	Place & State	Name & address of the customer	Estimated value of work in lakhs	Stipulated period of completion	Date when decision is expected	Remark if any
1	2	3	4	5	6	7

4.11 Certificate from Charted Account stating turnover for the last five years is also to be uploaded.

Sl.No	Year	Turn over amount	Remark
1	2019-20		
2	2020-21		
3	2021-22		
4	2022-23		
5	2023-24		

Litigation and Arbitral Issues:

4.12 Net pending litigations should not be more than 50% of bidder's net worth. As a supporting document of undertaking letter to be submitted by Bidder. It must be certified by Authorized Legal person / lawyer.

4.13 No consistent history of court/arbitral award decisions against the bidder for the last five years. As supporting document of under letter to be submitted by Bidder. It must be confirmed by Authorized Legal person/ lawyer.

5.Special Conditions

5.1.1 Establishment of Labor Camp is strictly prohibited in the premises of Indian Institute of Science Campus. Essential labor for round the clock work at site will be allowed with prior permission of Project Engineer cum Estate Officer.

5.1.2 Any damage to the existing service lines during execution of work shall be got rectified by the bidder at his own cost and risk.

5.1.3 Debris shall be disposed-off to an undisputed place of Bangalore outskirts as per the direction of the Engineer-in-Charge, whenever required.

5.1.4 Labor employed at the site will not be allowed to use cellphone while working at the site.

5.1.5 Supply of Electricity: - Electricity required for construction shall be arranged by the contractor himself. Electricity if supplied to the contractor by the Institute will be metered and amount will be recovered in the Bills as per actual at rates fixed by the Institute. Supply of electricity from the Institute is not mandatory. Non-supply of electricity by the Institute cannot be held as reason for shortfall in progress.

5.1.6 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 1.5 % of the value of the work.

5.2 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.

5.3 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, CPWD/MoRTH 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.

5.4 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.

5.5 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.

5.6 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.

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

5.8 Where there is discrepancy between the rates in figures and in words, the lower of the two will be governed.

5.9 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.

5.10 Where there is a discrepancy in entries of unit rate between the Original and Duplicate, the lower will govern.

5.11 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 Project Engineer-cum-Estate Officer of the work.

5.12 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 contractor's risk and cost.

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

6.GENERAL CONDITIONS

6.1 **DEFINITIONS OF TERMS**

In constituting these conditions and specifications, the following expressions shall have the meaning, therein assigned to them unless there is something repugnant in the subject of context in consisting with such meanings.

6.2 Institute shall mean the "Indian Institute of Science, Bangalore".

6.3 "Office" shall refer to the Office of the Project Engineer cum Estate officer.

6.4 "Contractors" shall mean the tenderer whether a firm, registered company, partnership or any individual whose tender has been accepted by Institute or by an Officer (duly authorized in this behalf) on behalf of the Institute and who has entered into agreement with Institute for due fulfillment of the contract and shall include the legal representatives, successors, heirs and assignees of the tenderer.

6.5 "Engineer" shall mean the "Project Engineer cum Estate officer", Indian Institute of Science, Bangalore or such other officer as may be appointed to call as the Project Engineer cum Estate officer for the purpose of the contract and shall also mean and include other officers of equivalent rank directly in charge of the work or any part thereof under administrative control of the Director, IISc, Bangalore-12.

6.6 When the Engineer is named as final authority, it includes all the above-mentioned officers and, in such matters, the contractors shall have the right of appeal against the orders up to the Director, IISc, Bangalore, whose decision shall be final and legally binding on all the parties concerned.

6.7 The Project Engineer cum Estate officer named as final authority for any decision taken, shall mean only the Director, IISc, Bangalore or his duly authorized assistant.

6.8 The Engineer in charge shall mean the Project Engineer cum Estate officer directly in charge of the work or his duly authorized assistants.

6.9 Plant shall mean and include any or all plants, machinery, tools and other implements of all description necessary for the execution of the work in a safe and workmen like manner.

6.10 The expression "Works" where used in these conditions shall unless thereby something in the subject or contract repayment to such construction, be construed to mean the work or the works constructed to be executed under or virtue of the contract whether temporary or permanent and whether original, altered, substituted or additional.

6.11 "Contract and contract document" shall mean and include the notice inviting tenders, proceedings of the pre bid meeting, the stamped agreement, conditions of contract, specifications and Schedules 'B', drawings and all other connected documents with tender schedule.

6.12 "Specifications" shall mean the specifications annexed and where these are not specifically mentioned shall be as may be detailed and necessary due to particular nature of work as approved by the Project Engineer cum Estate officer.

6.13 "Site" shall mean and include all the area in which operations in respect of the work are carried out. This shall also include materials stacking yards and the area where temporary structures are put up for installing any machinery etc.

6.14 "Tests" shall mean such tests as are required to be carried out either by the contractor or by the Project Engineer cum Estate officer from time to time on completion as detailed in the specifications before the work is certified as being satisfactory and is taken over by the Project Engineer cum Estate officer.

6.15 "Month" shall mean a Calendar month.

6.16 "Prime contractor" means a firm that performs construction work itself and that the

work is directly entrusted to the firm by the owner / Government / local body / Quasi Government / Government undertaking. Words used in singular shall also include the plural & vice-versa where the context so demands.

6.17 **CONTRACTOR TO INSPECT SITE**:

The contractor shall visit and examine the construction site and satisfy himself as to the nature of the existing roads or other means of communications, the character of the soil for the excavations, the extent and magnitude of the work and facilities for obtaining materials and shall obtain generally his own information on all matters affecting the execution of the work. No extra for charges made in consequence of any misunderstanding or incorrect information on any of these points or on the grounds of insufficient description will be allowed. All expenses incurred by the contractor in connection with obtaining information for submitting this tender including his visits to the site or efforts in compiling the tender shall be borne by the Tenderer and no claims for reimbursement thereof shall be entertained. .

6.18 ACCESS TO SITE:

The Contractor is to include in his rates for forming access to the site, with all temporary roads and gangways required for the works.

6.19 SETTING OUT:

The Contractor shall set out the building in accordance with the plans. All grid/center lines shall be pegged out to the satisfaction of the Engineer. The Contractor shall be responsible for the correctness of the lining out and any inaccuracies are to be rectified at his own expense. He will be responsible for taking ground levels of the site before setting out and recording them without any extra charge.

The Contractor shall construct and maintain proper benchmark at the intersection of all main walls, columns, etc., in order that the lines and levels may be accurately checked at all times.

6.20 **TREASURE TROVE**:

Should any treasure, fossils, minerals, or works of art of antique interest be found during excavation or while carrying out the works, the Contractor shall give immediate notice to the Engineer of any such discovery and shall make over such finds to the Institute.

6.21 **ACCESS FOR INSPECTION:**

The Contractor is to provide at all times during the progress of the works and the maintenance period proper means of access, with ladders, gangways etc., and the necessary attendants to move and adapt as directed for the inspection of measurement of the works by the Engineer or their representatives.

6.22 **ATTENDANCE UPON ALL TRADERS:**

The Contractor shall be required to permit tradesmen/ Specialized agencies appointed by the employer to execute works like water supply, Sanitary, Electrical installation, lifts, air conditioning, hardware and other specialized works. The contractor shall also permit the above mentioned agencies to use his scaffolding and retain the scaffolding till such works are completed. The rates quoted by the contractor shall be inclusive of the above facility.

6.23 **GATEKEEPER AND WATCHMAN:**

The Contractor from the time of being placed in possession of the site must make arrangements for watching, lighting and protecting the work, all materials, workmen and the public by round the clock on all days including Sundays and holidays at his own risk and cost.

6.24 **STORAGE OF MATERIALS:**

The Contractor shall provide for necessary sheds of adequate dimension for storage and protection of materials like cement, steel, lime, timber and such other materials including tools and equipment which are likely to deteriorate by the action of sun, wind, rain or other natural causes due to exposure in the open. The cement storage site shall be leak proof and shall hold at least 4 months requirement. All such sheds shall be cleared away and the

whole area left in good order on completion of the contract to the satisfaction of the Engineer.

All materials which are stored on the site such as bricks, aggregates etc., shall be stacked in such a manner as to facilitate rapid and easy checking of quantities of such materials.

6.25 **COST OF TRANSPORTING**:

The Contractor shall allow in his cost for all transporting, unloading, stacking and storing of supplies of goods and materials for this work on the site and in the places approved from time to time by the Engineer. The Contractor shall allow in his price for transport of all materials controlled or otherwise to the site.

6.26 **W.C. AND SANITARY ACCOMMODATION AND OFFICE ACCESSORIES AND ACCOMMODATION**:

The contractor shall provide at his own cost and expense adequate closet and sanitary accommodation complying in every respect to the rules and regulations in force of the local authorities and other public bodies, for his workmen, for the workmen of nominated sub-contractors and other contractors / specified agencies working in the building, the Project Engineer of works and other Institute agents connected with this building project and maintain the same in good working order.

The Contractor shall also provide at his own expense adequate office accommodation for the Project Engineer of works preferably contiguous to his office and shall maintain the same in a satisfactory condition and shall provide light, fan and attendant etc., for the same and shall remove them after completion of the works. He shall arrange to provide latest survey Instruments andat all times maintain the same in good working order at site, to enable the Project Engineer of works or other representative of Institute to check the lines and levels of the work.

6.27 **MATERIALS**:

Materials shall be of approved quality and the best of their kind available and shall conform to I.S. specifications. The Contractor shall order all the materials required for the execution of work as early as necessary and ensure that such materials are on site well ahead of requirement for use in the work. The work-involved calls for high standard of workmanship combined with speed and to the entire satisfaction of the Project Engineer.

6.28 **TO ASCERTAIN FROM CONTRACTORS FOR THE OTHER TRADES.**

The Contractor shall ascertain from all agencies / Sub-contractors all particulars relating to their work with regard to the order of its execution and the position in which chases, holes and similar items will be required; before the work is taken in hand as no patch works shall be allowed for cutting away work already executed in consequence of any neglect to ascertain these particulars beforehand.

6.29 **SAMPLE APPROVAL:**

Before ordering materials, the Contractor shall get the samples approved from the Project Engineer cum estate officer well in time.

6.30 **TESTING OF WORK AND MATERIAL**:

The Contractor shall, if required by the Engineer arrange to test materials and/or portions of the works at his own cost in order to prove their soundness and efficiency. If after any such test the work or portion of works is found in the opinion of the Engineer to be defective or unsound, the Contractor shall pull down and redo the same at his own cost. Defective materials shall immediately be removed from the site at his own cost.

6.31 **FOREMAN AND TRADESMEN:**

All Tradesmen shall be experienced men properly equipped with suitable tools for carrying out the work of carpentry and joinery and other specialist trades in a first-class manner and where the Engineer deem necessary, the Contractor shall provide such tools which are considered necessary for carrying out of the work in a proper manner.

All such tradesmen shall work under an experienced and properly trained Foreman, who shall be capable of reading and understanding all drawings, pertaining to this work and the contractor shall also comply with other conditions set out in different clauses of the conditions of the contract.

6.32 **PROJECTPROGRAMME OF WORKS AND WEEKLY PROGRESS REPORT**:

a) Organization chart:
The contractor should submit the proposed organization chart for the project including the details of staff to be deployed full time on site to the approval of Project Engineer, where the PROJECT ENGINEER raises any objection to either the qualification or experience or required professionalism of any of the staff deployed by the contractor, the same shall be replaced by suitably competent person to the approval of PROJECT ENGINEER within 7 days.

b) Program chart:
The Contractor shall furnish the detailed programme of execution for timely completion of the project (inclusive of rainy season). Such a detailed program of works prepared using Industry Standard Scheduling Software like MS Project 2000 or Primavera shall be submitted by the Contractor within ten days after receiving communication of tender acceptance. As per the detailed drawings and schedule of quantities; the contractor shall work out concurrent activities with start and finish times, integrating of all tasks with interface and milestone event drawn and to evaluate for reduction in total project duration through improved over lapping of tasks and activities where feasible. The Contractor shall plan for improved planning and scheduling of activities and forecasting of resource requirements, ability to use the computer effectively to produce timely valid information for Project Management purpose. Accordingly, PERT; CPM Networking shall be drawn. GANNT charts shall also be furnished. The Contractor shall also furnish necessary particulars to the Project Engineer of works for compiling weekly progress reports in the form furnished by the Institute. A monthly financial programme shall also be submitted.

6.33 **CLEARING OF SITE**:
The contractor shall after completion of the work clear the site of all debris and left-over materials at his own expense to the entire satisfaction of the Institute. The same should be carted out of the Institute at his own cost.

The contractor shall also clear the labour camp/RMC plant of all types of permanent/temporary structures, soak pits, sump, septic tanks or any other such installations as identified by the PROJECT ENGINEER to the entire satisfaction of the Institute. The debris/excess stuff shall be carted out of the Institute at his own risk and cost.

6.34 **PHOTOGRAPHS**:
The Contractor shall at his own expense supply to the Institute photographs in duplicate copies not less than 25 cm x 20 cm. (10” x 8”) along with soft copy, of the works taken from all the portions of the building at intervals of not more than one week during the progress of the work, or at every important stage of construction, as directed by the Project Engineer of work.

6.35 **PROVISION OF NOTICE BOARD**:
The Contractor shall provide a notice board on proper supports 3m x 2m (10' x 6') in a position approved by the Engineer. He shall allow for painting and lettering stating name of work; name of Architects; Structural Consultants; General Contractor and Sub-Contractors. All letters except that of the name of the work shall be in letters not exceeding 5 cm. in height and all to the approval of the Engineer. Proper barricading shall be erected all-round the site before commencement of the work.

6.36 **PROTECTION:**

The contractor shall properly cover up and protect all work throughout the duration of work until completion, particularly masonry, moldings, steps, terrazzo or floor finishes, staircases and balustrades, doors and window frames, plaster angles corners lighting and sanitary fittings, glass, paint work and all finishing.

6.37 **PREPARATION OF BUILDING FOR OCCUPATION AND USE ON COMPLETION:**

The whole of the work shall be thoroughly inspected by the Contractors and all deficiencies and defects set right. On completion of such inspection, the Contractor shall inform the Engineer in writing that he has finished the work and it is ready for the Engineer's inspection.

On completion, the Contractor shall clean all windows and doors and all glass panes, including cleaning of all floors, staircases and every part of the building including oiling of all hardware. He will leave the entire building neat and clean and ready for immediate occupation and to the satisfaction of the Engineer.

6.38 The tenderer must understand clearly that the rates quoted are for complete items of works including charges due to materials, labour, all lead and lift, HOM of plant and machineries, scaffolding, supervision, service works, power, all types of royalties, sales tax, labor cess, all types of taxes payable to the Govt and local bodies, overhead charges, etc., and includes all extra to cover the cost of night work if and when required and no claim for additional payment beyond the prices or rates quoted will be entertained for payment subsequently towards any claims on the grounds of misrepresentation or on point that he was supplied with information given by promise or guarantee by the Institute, or by any person whether member of or employee in Institute will not be entertained. Failure on the contractor's part to obtain all necessary information for the purpose of submitting his tender and quoting rates therein shall not absolve him of any risk or liability consequent upon the submission for tender.

6.39 All the works shall be carried out as per specifications prescribed by BIS, National Building code, CPWD / KPWD specifications, relevant IS codes or as directed by the Project Engineer in the absence thereof.

6.40 In case there is any conflict in the specifications and drawings the decision of the Project Engineer cum Estate officer shall be final and binding on the contractor.

6.41 All the materials shall be got approved by the Project Engineer cum Estate officer before use.

6.42 The rates quoted for in individual items shall include labour, cost of materials conveyance and lift charges for all materials required for successful completion of work and all taxes payable to any authority as per rules in vogue from time to time.

6.43 Necessary pillars shall be constructed by the Contractor for benchmark at no extra cost as directed by the Project Engineer.

6.44 Site order book shall be maintained in the work spot and the contractor shall sign in the order book in token of having gone through the instructions issued by the inspecting officers and carryout the instructions promptly.

6.45 In the work spot the contractor shall provide suitable temporary office with a covered area of 1000 sq.ft matching that of the Contractor's office with necessary furniture for use of Institute as directed by the Project Engineer for which no extra payment or compensation shall be claimed. The furniture however will after completion of the work, be the property of the contractor and shall remove them at the close of the contract.

6.46 The contractor shall take all precautions against damage from accident. No compensation will be allowed to the contractors for their tools and plant materials lost or damaged from any cause. The contractor is liable to make good the structure or plants damaged by any other cause at his own cost. The Institute will not pay the contractor for corrections or

repairing any damaged portion of work done during construction.

6.47 The contractor shall employ adequate no. of skilled & unskilled labours required for successful timely execution of work. He shall submit daily reports to the Engineer in charge regarding the strength of labour employed both skilled and unskilled.

6.48 The contractor shall furnish weekly medical report showing number of persons ill or incapacitated and nature of their illness, to the Project Engineer.

6.49 The contractor shall furnish a report of any accident which may occur, within 24 hours of its occurrence to the Project Engineer.

6.50 The contractor shall keep on site of work a qualified Engineer as required as per rules of registration as their authorized representative who will receive all instructions given from the Institute officers. The representative shall have permanent office at site of work where communications can be sent and notices can be served by the Project Engineer throughout the duration of work.

6.51 Prior approval should be obtained from the Project Engineer for the construction and location of the temporary site office, store sheds and labour quarters, within the premises of the site, similarly the contractor shall get approval of the Project Engineer regarding the areas to be utilized for stacking the materials etc., for the work.

6.52 Reference to detailed specifications are indicated against the items contained in the Schedule 'B', in case there is any item for which no detailed specifications is indicated, it shall be carried out as per specifications intimated by the Project Engineer. The contractor shall not be entitled for any extra claims or compensation on this account. In case of additional or extra items not covered by the Schedule 'B', the contractor shall carry out the work as per specifications intimated by the Project Engineer.

6.53 The Engineer shall have the right to direct the contractor to progress the various items of works in the manner prescribed by him.

6.54 Failure to adhere to any of the above will be sufficient cause for taking action under clause (2) or clause (3) or both along with their sub clauses of conditions of contract.

6.55 Contractor shall make arrangements at his own cost to construct approach road for conveyance of materials etc., preferably on the alignment accepted by the Institute to procure land etc. for housing, staff and workmen near the site of the work.

6.56 It is not possible for the Institute to release any quarry (metal and sand etc.,) for this work. The contractor has to make his own arrangements. No claim regarding leads and lift will be accepted.

6.57 The contractor has to make his own arrangements in regard to power supply and water required for construction and drinking water facilities.

6.58 Tool, Tax, Octroi, Royalty for collecting earth, gravel, sand, stone, excise duty, sales tax, labourcess or any other tax payable on account of this contract shall be met by Contractor.

6.59 The contractor shall be entirely responsible for sufficiency of the scaffolding, timbering, machinery, tools, implement and generally of all means used for fulfillment of the work. Whether such means may not be approved or recommended by the Project Engineer, the contractor must accept at his own cost all risks of accidents or damages.

6.60 After completion of the work, service drawings as per actual execution in Auto CAD should be submitted by the agency for services such as Electrical, Water supply and Sanitary before submission of final bill.

6.61 Extra care shall be taken regarding the laborers by providing waist belt, Helmets scaffolding etc. at your own cost and supervision and shall be carried out as per the

directions of the Project Engineer.

6.62 WORKMANSHIP AND LABOUR:

The quality of all materials, tools, operators and labour used on the work shall be subject to the approval of the Project Engineer cum Estate officer or his authorized agent who shall have power to order immediate removal by the contractor any of the above that may not meet with his approval.

In case of failure to carry out orders of removal within the time specified, the Project Engineer or his authorized agents shall get the same removed at the contractor's expense.

6.63 KEEPING DRY AND PUMPING:

Unless otherwise provided for in the contract, the contractor will at his own expense keep all portions of the work free from undue water, whether due to springs, soakage or inclement weather and will use his own implements and machinery for this purpose.

6.64 BAILING OUT OR DEWATERING:

Adequate arrangements shall be made by the contractor for dewatering the foundation trenches and excavation and keeping the same dry while the masonry or concrete work is in progress and till the Project Engineer considers that the mortar is sufficiently set.

The rates for the various items include the cost of shoring, strutting, coffer dam, channels or other incidental devices necessary for diverting the water met within foundation. The cofferdam and the diversion channel shall, however, be maintained in good and working condition till the completion of the structure or until such time, as in the opinion of the Project Engineer till the coffer dam or/and diversion channel is no longer necessary. Bailing out water necessitated by the failure to maintain the cofferdam and diversion channel will not be paid for separately under any conditions.

No extra rate shall be paid for removing any stuff outside, which might find excess due to rains or for reasons whatsoever from the sides or bottom of the foundation trenches and excavation or from also where when the dewatering operations are in progress.

The contractor must assure himself by making the necessary investigation regarding the depths to which foundations are likely to go. If any work is ordered to be done beyond dimensions or deviations marked in the drawings, no extra rate other than the rate for the Undertaking of work quoted by the contractor be paid.

The contractor will make himself arrangements for necessary plant such as Pump, engines, and other materials required in this connection.

6.65 FACILITIES FOR INSPECTION:

The work at all times be open for inspection by the Project Engineer or his duly authorized Assistant and the contractor shall arrange easy access to every part of the work and shall provide such ladders, scaffolding and lifts for this purpose as necessary at his own cost.

6.66 DELIVERY OF WORKS:

The final bill will be prepared after the work is handed over to the Project Engineer or his duly authorized representative in a thoroughly complete, clean, sound and workman like state.

6.67 EXTRA ITEM:

Whenever the contractor is ordered by the Project Engineer or the person duly authorized by him to execute any item of work, which is not in his tender, it shall be the contractors duty to see that the order is duly entered in the order book on the work, unless a separate communication to this effect is received by him, it shall be his duty to get the rates sanctioned for the item by the appropriate authority. For any extra item of work not thus ordered either by any entry in the order book or separate communication, the contractor shall have no claim to payment.

6.68 COMPLIANCE WITH BYELAWS AND PROTECTIONS AGAINST ACCIDENTS, ETC:
Contractor is responsible for complying with all acts, bye-laws, Municipal and other regulations for the provision and maintenance of lights during nights, barricading, providing any other protection that may be necessary and will be liable for all claims that may arise from accidents of nuisance caused by works.

6.69 DISPUTES:
Disputes on the points between the Project Engineer and the contractors shall be referred to the Center for campus management and Development, whose decision shall be given in writing and shall be final and binding on the contractor.

6.70 TOOLS ETC.,
The contractor shall unless otherwise specially stated in the contract, be responsible for the payment of all import duties, octroi duties, sales tax, quarry fees etc., on all materials and articles brought to site.

6.71 CLEARANCE OF SITE:
The site described and shown on the plan is to be cleared of all obstruction, loose stones and materials, rubbish of all kinds of shrubs and brushwood, the roots being entirely removed.
The products of the cleaning to be stacked in such a place and manner as ordered by the Project Engineer.

In jungle clearing all trees not marked for preservation, jungle wood and brushwood shall be cut down and their roots entirely removed up. All wood and materials from the clearings will be property of the Institute and should be stacked as the Engineer in charge directs. Trees shall not be cut without prior permission of the Institute.
All holes or hollow, whether originally existing or produced by digging up roots, shall be carefully filled up with earth well rammed to the required density and leveled off, as may be directed.

6.72 LINE OUT:
The contractor shall use necessary measuring instruments, theodolite, workstation and other materials like flags, strings, pegs, nails, pillars, paints, etc., and also Labour required for ascertaining of the initial ground levels at the different stages of excavation and construction of masonry or other structures at his own cost. Any dispute in regard to the accuracy of the measuring instruments and the device shall be subjected to the final decision of the Engineer-in charge of the work.

6.73 MACHINERY: All the machinery that will be employed on the work shall be approved, efficient and thoroughly, complying with the specifications of each machine or parts and shall have been manufactured by reputed and qualified firms. All the machinery employed on the work shall be open to inspection at all working hours, by the Project Engineer and any defect shall be rectified, repaired, replaced, renewed or remodeled so that its performance in the opinion of the Project Engineer is satisfactory. Any defective part of the machine, which requires replacement, shall be promptly replaced, failing which the Engineer-in-charge, shall be at liberty to cause the defective fittings removed from site of work at the cost of the contractor.

6.74 OPERATORS: The machines shall be in charge of efficient and trained operators, which terms shall include drivers, mechanics or other personnel who are actually operating the machines. The Engineer in-charge has the right to test operators, etc., as deemed necessary by him for the class of machinery, which he is to operate and shall drive out such of the operators who fail in the tests.

6.75 SAFETY PRECAUTION: All reasonable safety precautions for the safety of workers shall be taken. The contractors shall be responsible for the maintenance of all regulations under the Factory Act, workmen's compensation. Minimum wages act and other act for the safety and welfare of the workers employed by him. In addition, the contractors shall provide adequate protection to all workers employed by him against natural elements such as rain,

sun, wind etc., during working hours and provide free, pure protected drinking water during working hours.

6.76 NON-STOP OPERATION:

In the continuous or non-stop operations suitable shifts or working hours for each shift shall be maintained. The contractor is liable for all reasonable extra payment for all extra hours of work done by the workers employed by him.

6.77 TESTS:

The Project Engineer cum Estate officer or his authorized representatives shall have full scope and right of entry at all times to examine and test, measure, count, weigh, take bores, or in any manner satisfy himself that the work executed is according to the specifications and required strength. Any portion of work got disturbed, during such tests, shall be made good by the contractors, without extra cost. The Engineer in charge has the right to change the design proportions, mixes within reasonable limits to ensure requisite strength of the structure. Laboratory for requisite tests shall be established by the Contractor at site only, at his own cost.

6.78 ADEQUATE ARRANGEMENTS TO ACHIEVE PROGRESS:

The Project Engineer shall have the right to advise the contractor on the strength, quality and nature of labour to be employed on work to maintain progress on the work, commensurate with the strength of structure. Similarly, he shall advise the contractor on the nature and adequacy of the machinery that are required on the work.

6.79 DETAILS TO BE FURNISHED FOR ENGAGING SUB-CONTRACTOR FOR SPECIALISED WORKS:

The tenderer shall be required to engage agencies of standing and repute who have experience in executing works of similar nature and magnitude. Such specialized trades cover electrical installation (HT/LT), Lifts, A.C. sanitary and water supply works, firefighting installation and any such other trades as may be directed by the Institute. The successful tenderer shall be required to engage Sub-agencies for such specialized trades only with the prior written approval of the Project Engineer cum Estate officer after giving an opportunity to the Project Engineer cum Estate officer to evaluate the experience and competence of the sub-agency for each trade. In order to ensure implementation of this requirement, it is required that each tenderer shall submit along with his tender, names of three sub-agencies for each trade amongst whom tenderer proposes to engage if successful in the tender. Along with names of sub-agencies for each trade, the tenderer shall furnish in detail the following particulars in respect of each sub-agency.in the format furnished in Technical Bid.

All such information concerning sub-agencies shall be furnished along with the tender. Any tender containing insufficient information in this regard is liable for rejection. In the event of non-compliance of this requirement, the Institute shall have the right to nominate any sub-agency who in their opinion meets the selection criteria. In such event it would be incumbent on the successful tenderer, to accept and appoint then nominated sub-agency without demur and on this account, if there is any additional cost, such cost shall be borne by the successful tenderer. The Institute shall have no liability on this account. The Institute has the right to evaluate the experience, reputation etc., of such sub-agencies and on their approval in writing to the successful tenderer, successful tenderer shall be required to engage only such approved agencies for execution.

If the Institute is not satisfied with the performance or capability of the names in the panel furnished by the tenderer, the successful tenderer shall be required to engage an agency nominated by Institute. In all these matters, there shall be no additional financial implication to the Institute. The successful tenderer shall be required to execute works within the accepted rates only and no claim will be accepted due to the Institute, insistence on engaging any sub-agency. The Institute further reserves the right to instruct the successful tenderer to terminate the work of sub-agency at any time during the contract, if the performance is found unsatisfactory. In such case, the successful tenderer

shall be required to furnish a further panel of names from whom a similar selection can be made by the Institute In this instance also, the Institute is not liable for any additional cost. Responsibility for the delay occurred in this process, if any shall rest with the successful tenderer.

It is the responsibility of the successful tenderer to ensure that the sub-agencies engaged in the work comply with all the clauses in the agreement between the Institute and the successful tender. It shall be responsibility of the successful tenderer to exercise first line supervision on the works executed by his subagencies including supervision on the quality of materials and workmanship and to ensure that the subagencies comply with the technical specifications, drawings and bill of quantities. The successful tenderer shall also establish competent site organization technically and administratively to ensure that the works of various sub-agencies are supervised and well co-ordinate to ensure proper sequencing of construction and finishing works and to ensure that the overall time schedule is fully complied with.
The detailed construction programme schedule to be furnished by successful tenderer shall include action plan for procurement of materials and execution of works at site for each of the sub-agency and the detailed construction programme schedule shall reflect proper integration of each component of the building to ensure well-coordinated execution so as to complete the project including services within the stipulated time schedule.

6.80 Existing service lines such as electrical, water supply, sewer lines, telephone lines etc., shall be carefully protected and preserved before commencement and during excavation, dismantling /demolition operations. Details of UG facilities shall be provided to the successful tenderer. Any damage caused to the aforesaid service lines, etc., during excavation, demolition/dismantling shall be made good at Contractor's own expense/cost. Restoration of any service lines, which needs to be shifted and found in the proposed site, is the responsibility of the contractor and the agency shall carry out the work as per the direction of Project Engineer the cost of such work will be borne by the Institute.

6.81 Dust nuisance to neighbour shall be minimized by providing and erecting screens to the required height as per direction of Project Engineer cum Estate officer with Aluminium sheets or canvas or other suitable material before commencement of the work. The site shall be cleared off such protection arrangement after virtual completion of work. All the operations shall be carried out strictly in accordance to regulations of municipal and other local authorities and shall be restricted to normal working hours.

6.82 No debris or materials got from dismantlement/demolition the building(s) shall be thrown in the public road causing inconvenience to the traffic and any fine or penalty imposed by local authority for non-compliance of this provision shall be borne by the contractor.

6.83 The Contractor shall be responsible for any injury to persons, animals, or things and for all structural damage to property which may arise from the operation or neglect of himself and or any nominated sub-contractors, contractor's Employees and or third party whether such injury or damage arising from carelessness, accident or any other cause whatsoever, in any way connected with the carrying out the construction/dismantling/demolition.

The contractor shall take required insurance cover with an approved insurance company as provided in the contract and deposit with the Institute well before commencement of construction/ demolition / dismantling.

6.84 **Preservation of trees**: The contractor shall preserve all existing trees in and adjacent to

6.85 the site which does not interfere with the construction as determined by the Engineer-in charge.

6.86 **Drawings and working Details:** The work shall be carried out strictly in accordance with the approved plans and estimates and specifications and as per the instructions of

the Engineer-in-charge, and no deviations or changes are permitted without the written order of the Engineer. The designs and drawings enclosed with the tender documents are only typical and tentative. The working drawings and the working details of the several components of works will be prepared and made available at the time of execution and the contractor shall carryout the work in accordance with such working drawings and working details.

6.87 **Omissions and discrepancies in drawings and instructions:**
In all cases of omissions, doubts or discrepancies in the dimensions or discrepancies in the drawings and item of work, a reference shall be made to the Project Engineer cum Estate officer, whose elucidation and elaboration shall be considered as authorized. The Contractor shall be held responsible for any error that may occur in the work through lack of such reference and precautions.

6.88 The contractor shall be responsible for accuracy for all shapes, dimensions, and Alignments both vertical and horizontal etc., of all the components of the work.

6.89 **Lands for the use of the Contractors Camp:**
The contractor shall have to make his own arrangements at his own cost for construction of living accommodation outside the IISc premises. The Employee shall not provide any space / building for labour camp.

6.90 **Undesirable Person to be removed from site:**
The contractor shall not employ on site any person who is undesirable, if in the opinion of the Project Engineer the person or persons at site of work employed on behalf of the contractor is/are considered undesirable. The Project Engineer shall notify the contractor to this effect and the contractor will be bound by the decision of the Project Engineer to remove such person or persons from the site of work and from the labour camp. The contractor shall not be entitled to any damage or loss on this account. On the contrary, the contractor shall be liable to compensate the Institute for any loss or damage to the Institute property caused by the employment of such person.

6.91 **Labour Statistics**:
The contractor shall submit daily reports on the following:
(a) Total No. of labour employed in the working area.

6.92 **Execution of work during night times:**
The work shall normally be carried out between 08.00 hours and 17.00 hours with a break of one hour and when permitted during night period, the second shift shall be between 17.00 hours and 00 hours with a break of half an hour during night. When ordered to work at night, adequate provision for lighting the working area should be made by the contractor at his cost and got approved by Engineer. The agency shall not be paid extra for the works executed during night.

6.93 **Safety code:**

a) The Contractor at a prominent place at work spot should bring these safety provisions to the notice of all concerned by display on notice board. The persons responsible for compliance of the safety code shall be named therein by the contractor.
b) To ensure effective enforcement of the rules relating to safety precautions, the arrangement made by the contractor shall be open to inspection by the Labour Officer, Engineer or his representatives.
c) All necessary personal safety equipment's as considered adequate by the Engineer should be kept available for immediate use of persons employed at the site and maintained in the good condition and the contractor should take adequate steps to ensure proper use of equipment by those concerned.
d) Workers employed on mixing concrete, cement grout, cement mortar shall be provided with protective footwear protective goggles and protective gloves. Those engaged in mixing or stacking cement or any materials injurious to the eye, nose and mouth shall be provided with a face mask and protective cover free of cost by

the contractor.

e) Those engaged in welding work shall be provided with welder's protective eye Shield and gloves. Stonebreakers shall be provided with protective goggle and protective clothing and seated at sufficiently safe intervals.
f) Those engaged in binding and fabricating steel shall be provided with protective gloves.
g) Those engaged in deep cuts, large rock excavation shall be provided with helmets.
h) All labour / persons at work shall wear helmet compulsorily.
i) When the work is near any place where there is risk of drowning all necessary equipment's shall be kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provisions should be made for prompt first aid treatment of all injuries likely to be sustained during the course of work.
j) Adequate and suitable caution and danger signal boards shall be prominently exhibited at road/high tension overhead line/where heavy electrical machines are working where overhead cranes or hoist; derricks, winches are working where blasting zone is demarcated. The content of the board shall be in English and the local language for easy identification.
k) All scaffolding, ladder, stairways, gangways, staging, centering, form work and temporary support and safety devices etc., shall be sound in strength and constructed and maintained as such throughout its use. The agency shall obtain approval from Project Engineer cum Estate officer for scaffolding, formwork etc., before commencement of work.
l) No materials on any site of work shall be so stacked as to cause danger or inconvenience to any persons or public.
m) The Contractor shall provide all necessary fencing and lighting to protect the public/working men from accident and shall be bound to bear the expense of defense of every suit action or other proceedings of law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and cost, which may be awarded in any such suit action or proceedings to any such persons or which may with consent of the contractor be paid to compensate any claims by any such person.
n) No electric cables or apparatus, which is liable to be a source of danger to persons, employed shall remain electrically charged unless a caution Board is put into that effect and close approach to the same is prohibited.
o) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosives. No floor, roof or other portion of any building used for residence shall be so over-loaded with debris or materials so as to render it unsafe.
p) The final disposal of water used for work or removed from work spot as well as the supply used for domestic consumption shall be as directed by the Engineer. The contractor shall make his own arrangement for purification of domestic water supply used by his staff and labour colony and used on the site of work to the satisfaction of the Engineer.

q) The source of drinking water supply/distribution system in workers colony shall be protected from chances of contamination by poisonous materials epidemic causing infections bacteria etc., by maintaining the source and system under adequate hygienic conditions.
r) Notwithstanding the above clauses, there is nothing in this to exempt the contractor to exclude the operations of any other Act or Rules in force of the Central Govt., State Govt.

6.94 **AWARENESS OF SITE CONDITIONS AND CARRYING OUT OF SITE INSPECTION PRIOR TO TENDERSUBMISSION:**

Prior to the preparation and submission of his Tender, the Contractor shall make visits to the site and carry out all the necessary inspections and investigations in order to obtain all information and to make his own assessment of the conditions and constraints at site, including the means of access to it. The Contractor shall make himself aware of all the

features of the site and the working conditions and space and shall, in general, be responsible for obtaining all the necessary and requisite information needed for him to prepare and submit his Tender.
Should the Contractor require any clarifications he shall seek these in writing from the Project Engineer before submitting his Tender. At no stage will any extra claims be entertained or allowed on any matter or for any reason arising from or as a consequence of the Contractor's failure to comply with all the requirements stipulated in this Clause.

6.95 **WORK AND WORKMANSHIP**

To determine the acceptable standard of workmanship, the Project Engineer may order the Contractor to execute certain portions of works and services under the close supervision of the Project Engineer. On approval, they shall label these items as guiding samples so that furtherworks are executed to conform to these samples.

6.96 **TEST CERTIFICATES**

The contractor shall submit copy of test certificates for all the major electrical equipment such as circuit breakers, CTs, PTs, instruments, relays, busducts, rising mains, busbars, cables etc., and panel as a whole, confirming to relevant IS/BIS standards issued by manufacturers.

6.97 **SAMPLES AND CATALOGUES**

Before ordering the material necessary for these installations, the contractor shall submit to the Engineer-in-Charge/Consultants for approval, a sample of every kind of material such as cables, conductors, conduits, switches, socket outlets, circuit breakers, lighting fixtures, boxes etc., along with the catalogues with their dimensional details.
For major items such as sub lighting panels distribution boards, the submission of drawings/catalogues along with technical details shall be enough. Prior to ordering any electrical equipment/material/system, the contractor shall submit to the Engineer-in-Charge/Consultants the catalogues, along with the samples, where applicable, from the approved manufacturer. The contractor shall arrange inspection and testing at the manufacturer's factory or assembly shop for final approval. No material shall be procured prior to the approval of the Engineer-in-Charge/Consultant.

Also, the contractor shall ensure that the dimensional details of the equipment fit into the allotted space provided in the building.

6.98 **COMPLETION CERTIFICATE**

On completion of the electrical installation a certificate shall be furnished by the contractor countersigned by the licensed supervisor, under whose direct supervision the installation was carried out.

6.99 **PERFORMANCE GUARANTEE**

The contractor shall indemnify the Institute against defective materials and workmanship for a period of one year after completion of the work. The contractor shall also hold himself fully responsible during that period for reinstallation or replacement at free of cost to institute, the following:
Any defective work or material supplied by the Contractor.

Any material or equipment damaged or destroyed as a result of defective workmanship by the contractor.

6.100 **RATE ANALYSIS**

At anytime and at the request of the Project Engineer the contractor shall provide details or breakdown of costs and prices of any part or parts of the works.

6.101 The Project Engineer cum estate officer of IISc reserves the rights to delete any item from the contractor’s scope of work.

7.CONTRACTOR'S LABOUR REGULATIONS

7.1 DEFINITION:

In these regulations unless otherwise, expressed or indicated the following words and expressions shall have the meaning hereby assigned respectively that is to say:

Labour means workers employed by the contractor or the Institute directly or indirectly through sub-contractor or any other person, or any agent on his behalf on a payment as per prevailing Karnataka State labour regulations and will not include supervisory staff like overseers etc.

Fair wages means whether for item or place of work notified at the time of inviting tenders for the work and where such wages have not been so notified, the wages prescribed by the Karnataka Public Works Department for the district in which the work is done.

Contractors shall include every person whether a sub-contractor head or agent employing labour on the work taken contract.

The relevant orders of Government of Karnataka in regard to payment of wages as amended from time to time shall be followed by the contractor.

7.2 WORKING HOURS:

Normally working hours of a labour employed should not exceed 8 hours a day. The working day shall be so arranged that inclusive of interval for rest if any, it shall not spread over more than 12 hours on any day.

When a worker is made to work for more than 8 hours on a day or for more than 48 hours in any week, he is entitled to double the ordinary rate of wages. Children shall not be made to work.

Every worker shall be given a paid weekly holiday normally on Sunday.

7.3 DISPLAY OF NOTICE REGARDING WAGES ETC.

The contractor shall (a) before he commences his work on contract, display and correctly maintain in a clean legible condition in conspicuous places on the work, notices in English and in the local language spoken by the majority of the workers, giving the rate of wages which have been certified by the Regional Labour Commissioner, as fair wages and the hours of work which such wages are earned, and a copy of such notices shall be sent to the certifying officers.

7.4 PAYMENT OF WAGES:

Wages due to every worker shall be paid to him direct.

7.5 FIXATION OF WAGES PERIODS:

The contractor shall fix the wages period of which the wages shall be payable.
Wages of every worker employed on the contract shall be paid.

In case of establishments in which the wage period is one week, within three days from the end of the wage period wages shall be paid. In the case of other establishment before the expiry of the 7th day or 10th day from the end of the wage period according to the numbers of the workers employed in such establishment does not exceed 100 or exceeds 1000.

When the employment of any workers is terminated by or on behalf of the contractor the wages earned by him shall be paid before the expiry of the days succeeding the one which his employment is terminated.

All payment of wages shall be made on a working day except when the work is completed before the expiry of the wages period in which case final payment shall be made within 48 hours of the last working day at work site and during the time.

NOTE: The term working day means a day on which the labour is employed, and the work is in progress.

7.6 FINE AND DEDUCTIONS WHICH MAY BE MADE FROM WAGES:

The Wages of workers shall be paid to him without any deductions of any kind except the following deductions:

Deductions for absence for duty i.e., from the place or the places whereby the terms of his employment he is required to work. The amount of deductions shall be in proportion to the period for which he was absent.

Deductions for damage or loss of goods expressly entrusted to the employed person for custody or for loss of money or any other deduction which he is required to account, where such damage or loss is directly attributable to neglect or default.

Deduction for recovery of advance or for adjustment of over payment of wages, advance granted shall be entered in a register.

And other deductions which the Institute may from time to time allow.

7.7 Fine:

No fine shall be imposed on any worker save in respect of such acts and the Commissioner of Labour has approved omissions on his part as.

No fine shall be imposed on a worker and no deduction for damage or loss be made from his wages until the worker has been given an opportunity. Undertaking of showing cause against such fines or deductions.

The total amount of fines which may be imposed in any one wage period on a worker shall not exceed an amount equal to the wages payable to him in respect of that wage period.

No fine imposed on any worker shall be recovered from him by instalments or after the expiry of sixty days from the date which it was imposed.

Every fine shall be deemed to have imposed on a day of the act or omission in respect of which it was imposed.

The contractor shall issue an employment card in Form III to each worker on the day of the worker's entry into the employment. If the worker has already any such card with him for the previous employment of contractor, he shall merely endorse that employment card with relevant entries. On termination of employment, the employment card shall again be endorsed by the contractor and returned to the worker.

7.8 REGISTER OF UNPAID WAGES:
The contractor should maintain a register of unpaid wages in such a form as may be convenient at the place of work but same shall include the following particulars:

- Full particulars of the labourer's whose wages have not been paid.
- Reference number of the muster roll and wage register
- Rate of wages
- The period
- Total amount not paid
- Reasons for not making payment
- How the amount of unpaid wages was utilized
- Acquaintance with dates.

7.9 REGISTER OF ACCIDENTS:
The contractor shall maintain a register of accidents in such form as may be convenient at the workplace but the same shall include the following particulars.

- Full particulars of the laborers who met with accidents.
- Rate of wages
- Sex
- Age

- Nature of accidents and cause of accident
- Time and date of accidents
- Date and time when admitted in Hospital
- Date of discharge from the Hospital.

The agency shall alone be liable to pay compensation for any damage/death /injury sustained by the personnel or any other members of the agency in the course of their work/duty at the Institute during the contract period. Govt. of India issued guidelines on payment of compensation in cases of death / permanent incapacitation of person due to unintended/ unforeseen occurrences during maintenance, operation and provisioning of public services. Under these guidelines, the agency has to pay an amount of Rs. 10 Lakhs as compensation in the cases where a person is died and up to Rs. 7.5 Lakhs in the case of disabled based on loss of earning capacity. Institute has the right to recover further penalty in the cases where the incidents have happened with the negligence of the agency.

7.10 REGISTER OF FINE ETC.

The contractor shall maintain a register of fines and a register of deductions for damages or loss in form Nos. I and II respectively which shall be kept at the place of work.

The contractor shall maintain both in English and local language a list approved by Commissioner for labour clearly stating the acts and commissions for which penalty or fine may be imposed on a workman and display it in a good condition in conspicuous place on the work.

7.11 SUBMISSION OF RETURNS:

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

7.12 AMENDMENTS:

The Government of Karnataka may from time to time add to or amend the regulations and on may question as to the application interpretation on effect if these regulations the decision of the Commissioner of Labour or Deputy Commissioner for Labour to Govt. in that behalf shall be final.

7.13 Labour Clause

No labourers below the age of 18 years shall be employed on the work.

Payments of wages of labourers. The contractor shall pay not less than fair wage of labourers engaged by him on the work.

EXPLANATION:

(a)The contractor shall notwithstanding the provision of any contract to the contrary cause to be paid wages to labourers indirectly engaged for the work including any labour engaged by his sub-contractors in connection with the same works if the labourers have been immediately employed by him.

(b)In respect of all labours directly or indirectly employed in the works for the performance of the contractor's part of this agreement, the contractor shall comply with or cause to be complied with Govt. of India, Contractors Labour Regulations from time to time, in regard to payment of wages. Wage period, deductions from wages recovery of wages not paid and deductions unauthorized made, maintenance of wage book, wage slips, publication of scale of wage and other terms of employment, inspection and submission of periodical returns and all other matter of a like nature.

The Project Engineer cum Estate officer or In-charge Engineer concerned shall have the right to deduct from the money due to the contractors any sum required for making good the loss suffered by a worker or workers by reason of non-fulfilment of the conditions of the contract for the benefit of the workers, non-payment of wages or of deductions made from his or her wages which are not justified by their terms of the contractor non-observance of the regulations.

(c) For payment of minimum wages, the Contractor is bound to follow the relevant orders of Govt. of India from time to time.

(d)Vis-à-vis the Institute the contractor shall be primarily liable for all payments to be made under and for the observance of the regulations aforesaid without prejudice to his right to claim

indemnity from his sub-contractors. The regulations aforesaid shall be deemed to be part of this contract, and any breach there of shall be deemed to be a breach of this.

7.14 In respect of all labour directly or indirectly employed in the work for the performance of the contractor's part of this agreements the contractor shall at his own expense arrange for the safety provisions as per Karnataka P.W.D. safety code framed from time to time and shall at his own expense provide for all facilities in arrangements and provide necessary facilities as aforesaid he shall be liable to pay penalty of Rs.50/- for each default and in addition the Project Engineer cum Estate officer in charge shall be at liberty to make arrangements and provide facilities as aforesaid, and recover the cost incurred in that behalf from the contractor.

7.15 The contractor shall submit by the 4th and 19th of every month to the Project Engineer of true statement showing in respect of the second half of the preceding month and the first half of the current month respectively (1) the name of labourers employed by him on the work (2) their working hours, (3) the wages paid to them, (4) the accidents that occurred during the said fortnight showing the circumstances under which they happened and the extent of damage and injury caused to them and (5) the number of female workers who have been allowed, maternity benefit according to clause 19F and the amount paid to them, failing which the contractor shall be liable to pay the Institute a sum of not exceeding Rs. 50/- for each default or materially incorrect statement by deduction from any bill due to the contractor and amount levied as fine.

7.16 In respect of all labour directly or indirectly employed in the works for the performance of the contractor's part of this agreement, the contractor shall comply with or cause to be complied with all the rules framed by Institute from time to time for the protection of health and sanitary arrangements for workers employed by the Indian Institute of Science and its contractors.

7.17 Maternity benefit rules for female workers employed by contractor, leave and pay during leave shall be regulated as follows:

(i) in case of delivery: Leave during maternity leave not exceeding 8 weeks up to and including the day of delivery and 4 weeks following that day.

(ii)In case of miscarriage, up to 3 weeks from the date of miscarriage.

7.18 Pay:

i)In case of delivery: Leave pay during maternity leave will be at the rate of women's average daily earning calculated on the total wages earned on the days when full time work was done during the period of three months immediately preceding the date on which she gives notice that she expects to be confined.

ii)In case of miscarriages: Leave pay at the rate of average daily earnings calculated on the total wages earned on the day's full time works was due during a period of 3 months immediately preceding the date of miscarriage.

iii)Conditions for the grant of maternity leave: No maternity leave benefit shall be admissible to a woman unless she has been employed for a total period of not less than 10 Months immediately preceding the date of delivery /miscarriage.

8.CONDITIONS OF CONTRACT

Clause 1. <u>Security Deposit</u>

Estimated cost of the work put to tender	E.M.D Percentage	S.D. Percentage
(i)	(ii)	(iii)
Rs.29,93,238.71	2%	5.5%
Note : EMD + SD to be limited to 7.5% of the contract value		

(a) Clause -1(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 SD at the percentage mentioned in Column (iii) of the table given below of all moneys payable of 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. The EMD + SD will be limited to 7.5% of the contract value.

E.M.D - Earnest Money Deposit
S.D-Security Deposit

No Interest will be paid on EMD / Further / Additional Security deposit.

(b) Additional 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. The Project Engineer cum Estate officer may allow if a portion of the work is withdrawn from the Contractor under the provisions of Clause 12(a) a proportionate reduction in the amount of security Deposit.

a) EMD paid along with the tender shall be refunded only after the completion of the defect liability period or payment of final bill whichever is later without any interest.

b) 1% labour cess towards workers Welfare Fund on the works expenditure will be recovered from RA bills for depositing the same to the welfare board as per Karnataka Govt. Order. Rates quoted should be inclusive of cess.

(c) However, if the Contractor desires, agency may furnish a BG issued by the Public Sector Undertaking Bank/ Scheduled commercial Bank/Nationalized Bank in favour of the Registrar, Indian Institute of Science, payable at Bangalore amounting to **5.5%** of the total contract value valid upto completion of defect liability period in which case EMD deposited by them will be refunded and no recoveries towards security deposit will be effected in the running account bills.

(d) Dues to Institute, to be setoff 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 his security deposit or any part thereof. Otherwise, the amount will be treated as outstanding due from the agency.

(e) Refund of Security Deposit (EMD &SD):

i) EMD paid by the contractor at the time of tendering and SD deducted from the R.A bills at the prescribed rates shall be refunded to the contractor immediately after the virtual

completion of the work against production of bank guarantee for an equal amount from any of the Scheduled commercial Bank/Nationalized Bank valid for a period as mentioned in clause(ii)below.

ii) The bank guarantee received as stipulated in (i)above, will be treated as performance guarantee and shall be returned to the contractor after the final bill is paid or after **Twenty Four Months including monsoon period** from the date of virtual completion of the work during which period the work should be maintained by the contractor in good order, which ever is later. The validity of the bank guarantee shall be maintained for the above period.

iii) In case of BG's furnished towards security deposit same shall be returned after completion of the defect liability period.

Clause 2. PENALTY FOR DELAY

a) Written Order to Commence Work

After acceptance of the tender, the Project Engineer cum Estate officer 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. 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 by the contractor during execution of agreement.

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

The Project Engineer cum Estate officer shall review the progress of all works with the contractor at least once every month. Such a review shall take into account the programme fixed for the previous week, obligations on the part of the Institute for issue of drawings etc, and also the obligations on the part of the Contractor. The review shall also examine the accumulated delays by the contractor if any and mitigation measures proposed by the contractor to overcome the delay.

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 and the Contractor. If the contractor refuses to sign the said record, approval of the reasons for delay may be submitted to **CENTER FOR CAMPUS MANAGEMENT AND DEVELOPMENT (CCMD)** for approval and such approval is binding on the contractor.

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 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(d)** below.

Grant of extension of time.

If the delay is attributable to reasons beyond the control of the Contractor, requisite extension of time shall be granted by the Project Engineer cum Estate officer in accordance with **Clause 5** after obtaining the approval of his higher authorities, wherever necessary.

Review of progress by Centre for Campus Management and Development.

The Centre for Campus Management and Development shall review the progress periodically, preferably more number of times as required. These reviews are in addition to the monthly reviews required to be done by the Project Engineer cum Estate officer. The results of such review by the CENTER FOR CAMPUS MANAGEMENT AND DEVELOPMENT (CCMD) shall, wherever necessary, be incorporated in the next review of the Project Engineer cum Estate officer.

If the Contractor stops the work for 45 days when no stoppage of work is shown on the current Program and the stoppage has not been authorized by the Employer, then The Employer may terminate the Contract at the risk and cost of the contractor.

Settlement of dispute regarding shortfall in progress.

In case of dispute between the Project Engineer cum Estate officer and Contractor regarding the responsibility for the shortfall in progress, the matter shall be referred to the Centre for Campus Management and Development who shall thereupon give a decision within fifteen days from the date of receipt of reference. The decision of the Centre for campus management and Development shall be final and binding on the contractor and the Project Engineer cum Estate officer.

d) 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 contract value of the balance work assessed according to the programme(Clause 35), 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 subjected to a maximum of 10 percent of the contract value 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 considers it necessary, he shall be entitled to take action as indicated in **Clause 3 (d)** also.

d.(1). Liquidated damages

The Contractor shall pay liquidated damages to the Employer at the rate per day stated in the Contract Data for each day that the Completion Date is later than the Intended Completion Date (for the whole of the works or the milestone as stated in the Contract Data). The total amount of liquidated damages shall not exceed the amount defined in the Contract Data. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages does not affect the Contractor's liabilities.

If the Intended Completion Date is extended after liquidated damages have been paid, the Employer shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment of bill.

(e) 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.

ACTION WHEN WHOLE OF SECURITY DEPOSIT IS FORFEITED

Clause 3. 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 instalment from his bills as Further Security Deposit, the Project Engineer cum Estate officer 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 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 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 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 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 Otherwise the amount will be treated as outstanding due from the agency.

(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 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, 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 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.

(f) Recoveryof1%ofthecontractvaluetowardsthelaborerswelfarefundcreatedbytheGovernmentofKarnatakawillbeeffected in the running account bills of the contractor.

Clause 4. <u>CONTRACTOR TO REMAIN LIABLE TO PAY COMPENSATION IF ACTION IS NOT TAKEN UNDER CLAUSE-3</u>.

In any case in which any of the powers conferred upon the Project Engineer cum Estate officer 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.

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

In the event of the Project Engineer cum Estate officer 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 whose certificate thereof shall be final. In the alternative, the Project Engineer cum Estate officer may after giving notice in writing to the contractor or his clerk of the works, foreman or other authorised 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 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 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. <u>GRANT OF EXTENSION OF TIME</u>

(a) If the contractor shall desire an extension of the time for completion of the work, he shall apply in writing to the Project Engineer cum Estate officer 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 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 commensu rate with its increase in costoc casioned by alterations or additions and the certificate of the Project Engineer cum Estate officer or other competent authority as to such proportion shall be conclusive.

Clause 6. ISSUE OF FINAL CERTIFICATE – CONDITIONS REGARDING

On completion of the work the contractor shall report in writing to the Project Engineer cum Estate officer the completion of the work. Then he shall be furnished with a certificate by the Project Engineer cum Estate officer 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 or other competent authority, or where the measurements have been taken by his Project Engineer until they have received the approval of the Project Engineer cum Estate officer 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 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.

Note: 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 bathrooms, 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. The Running account bills will be paid within three weeks from the date of submission of the bill in complete acceptable form after duly checked and certified by concerned Engineer, under normal circumstances.

Allbillsshallbepreparedintheprescribedprintedandelectronicforminpdf/Excelformatinquadruplicateandhanded over to the Project Engineer in charge of the work/ Project Engineer cum Estate officer's Office and acknowledgment obtained.

The charges to be made in the bills shall always be entered at the rates specified in the tender in full or in part as the case may be, in the case of any extra work ordered in pursuance of these conditions, and not mentioned or provided for in the tender, the charges in the bills shall be entered at the rates hereinafter provided for such work.

(b) Scrutiny of Bills and measurement of work

The details furnished by the Contractor in the bill will be completely scrutinized and the said work will be measured by the Project Engineer 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,

along with the Test certificates to be produced with the bill, which shall be binding on the contractor in all respects.
(c) One copy of the passed bill shall be given to the Contractor without any charge.

Clause 8. PAYMENT PROPORTIONATE TO WORK APPROVED AND PASSED.

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 Project Engineer as per Clause 7(b) entitled to necessary Payment proportionate to the part of the work then approved and passed by the Project Engineer cum Estate officer or other competent authority whose certificate of such approval and passing of the sum so payable shall be final and conclusive against the contractor i.e. part payment of submitted RA bills is admissible to contractor. Any such reduced payment amount is admissible for adjustment in the successive RA Bills or Final Bill.

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 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.

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 or other competent authority from requiring any bad, unsound imperfect or unskilful 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 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.

Submission of Final bill and its settlement
The contractor shall submit the final bill within one month from the date of actual completion of the work in all respects. His claims shall be settled within five months from the date of submission of the bill in complete acceptable form after duly checked and certified by concerned Engineer, under normal circumstances.

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 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 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, this detailed specification shall be strictly adhered to, supplemented by relevant provisions of Indian standard specifications, the code of practice; etc., The Indian standard specification, National Building Code 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 Project Engineer cum Estate officer and the relevant provisions of the Indian standard specifications.

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

The Project Engineer cum Estate officer 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: -

a) Increase or decrease the quantity of any work included in the contract.
b) Omit any such work.
c) Change the character or quality or kind of any such work,
d) Change the levels, lines, positions and dimensions of any part of the work,
e) Executeadditionalworkofanykindnecessaryforthecompletionoftheworksand
f) Change in any specified sequence, methods or timing of construction of any part of the work.

Contractor bound by Project Engineer cum Estate officer'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 or other competent authority and such alteration shall not in any way vitiate or invalidate the contract.

Standard Quantity Take-off (SQT)

Contractor within **14 days** of Issue of LOI to submit the Project Manager & seek approval for the Standard quantity Take-off sheets for all the items mentioned in the Tender BOQ, after due referencing the Tender/ GFC drawings and the Technical Specification. Upon approval, the SQT shall remain the base document for initiating any

change orders/ variation in accordance to Clause 31, tracking the daily project progress, and for the measurement sheets.

Orders for variations to be in writing

1. 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 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, 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 and if such confirmation is not contradicted in writing within fourteen days by the Project Engineer cum Estate officer, it shall be deemed to be an order in writing by the Project Engineer cum Estate officer.

2. **a)**Any additional work which the contract or may be directed to do in the manner above specified as part of the work shall be carried out by the Contract or 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 Undertaking 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) Rate for excess quantity beyond 125 percent of tendered quantity

The Additional quantity which exceeds 125 percent of the tendered quantity shall be paid at the rates entered in or derived from Schedule of Rates prevalent at the time of executing additions and alterations plus or minus the overall percentage of the original tendered rates over the current Schedule of Rates (KPWD) of the year in which the tender is accepted (as per the comparative Statement prepared at the time of acceptance of the tender).

(c) 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 CCMD shall be final and binding on the contractor.

(d) 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 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 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 Project Engineer cum Estate Officer, CCMD shall be final.

Working out the data rates for non-SR/ non tendered items shall be based on the procedures laid down in the standard rate analysis format of KPWD Bangalore circle Bangalore. The data rates shall be approved by the Project Engineer cum Estate Officer, CCMD and shall be binding on the contractor.

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 or other competent authority within 30 days of the cause of such claim occurring.

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

(a) If at anytime after the execution of the contract documents, the Project Engineer cum Estate officer 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 there upon suspend or stop the work totally or partially as the case may be. In any such case, except as provided here under, the contractor shall have no claim toanypaymentofcompensationwhatsoeveronaccountofanyprofitoradvantagewhichhemighth avederivedfromtheexecutionoftheworkinfullbutwhichhedid not so derive in consequence of the full amount of the work not having been carried out, or on account of any loss tha the 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 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 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 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 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 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 or other competent authority by the contractor within seven days after the expiry of the above period.

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 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 or other competent authority that any work has been executed with unsound, imperfect or unskilful 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 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 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 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 the Project Engineer cum Estate officer or other competent authority for any valid reasons consider that 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 RESPONSIBLE AGENT 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 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 or other competent authority Project Engineer to visit the work shall have been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing present for 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.

(b) Employment of Minimum Technical Staff

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

a) One qualified Graduate Engineer &One qualified Diploma Engineer, when the cost of the work to be executed up to 1Crore,
b) Two qualified Graduate Engineer& Three qualified Diploma Engineer, when the cost of the work to be executed from 1 Crore to 10 crores;
c) Three qualified Graduate Engineer & Six qualified Diploma Engineer, when the cost of the work to be executed above 10 crores;
d) 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 to ensure efficient execution of work.
e) The technical staff so employed, should be available at site whenever required by Engineer in-charge to take instructions.
f) If the contractor fails to employ the technical staff as aforesaid, he shall be liable to pay a sum of Rs. 25000 (Rupees Twenty thousand only) for each month of default in the case of Graduate Engineers and Rs.15000 (Rupees Ten thousand only) for each month of default in case of Diploma Holders.
g) If the Contractor himself possesses the required qualification and is available at the site for receiving instructions from the Project Engineer cum Estate officer 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 or his Project Engineer 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 or other competent authority or his Project Engineer 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 FOR IMPERFECTIONS FOR TWELVE MONTHS AFTERCERTIFICATE 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 or other competent authority the contractor shall make good the same at his own expenses, or in default the Project Engineer cum Estate officer 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 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.

The Defects liability period shall be extended for as long as defects remain to be corrected. Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Institute.

Clause 17. CONTRACTOR TO SUPPLY PLANT, LADDERS, SCAFFOLDINGS, ETC., ANDIS LIABLE FOR DAMAGES ARISINGFROM 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 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 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 suit, action or 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. 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 and the estimate of the Project Engineer cum Estate officer, subject to the decision of the Centre for Campus Management and Development 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 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. 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 or other competent authority.

Clause 21. 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 specialized nature and normally not executable by a general contractor could be got done by the specialized agencies which are executing such works, after obtaining the specific approval of the Project Engineer cum Estate officer 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.

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 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 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.

(b) **Recoveryofexcesspaymentsbasedonexcessmeasurementsandactionagainstcontractor.**

Whenever it is noticed that excess payments have been made to the contractor based on excess measurements recorded by the Project Engineer in the measurement book and countersigned by the contractor or his duly authorized 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 blacklist him.

Change in classification of excavations accepted not permitted.

Once the measurements mentioning the classification of the excavations are recorded in the measurement book and the same is signed by the contractor or his authorized agent in token of acceptance, no request for reclassification by the contractors shall be entrained.

(c) **Criminal proceedings against IISc Officer 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 22. SUM PAYABLE BY WAY OF COMPENSATION TO BE CONSIDEREDAS REASONABLE COMPENSATIONWITHOUT REFERENCE TO ACTUAL 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 23. <u>SETTLEMENT OF DISPUTES -TIME LIMIT FOR DECISION</u>

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

(i) The meaning of the specification's designs, drawing and instructions here in before mentioned,

(ii) The quality of workman ship 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, 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 Centre for campus management and Development who have jurisdiction over the work specified in the contract. The Centre for campus management and Development 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.

If the decision of the Centre for campus management and Development is not acceptable to the contractor, he may approach the **Director, IISc within** a period of 15 days for settlement.

(b) Director, IISc decision's final.

Subject to other form of settlement hereafter provided, the Director's decision in respect of every dispute or difference so referred shall be final binding upon the contractor. The said decision shall forthwith be given effect to and contractor shall proceed with the execution of the work with all due diligence.

(c) Remedy when Director's decision is not acceptable to contractor.

In case the decision of the Director is not acceptable to the contractor, he may approach the Law Court at Bangalore for settlement of dispute after giving due written notice in this regard to the Director within a period of ninety days from the date of receipt of the written notice of the decision of the Director. Further, the Bangalore courts alone shall have the exclusive jurisdiction.

(d) 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.

(e) 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.

(f) 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 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 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 24. CONTRACTOR TO PAY COMPENSATION UNDER WORKMEN'S COMPENSATION 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 25. 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: -

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

Clause 26. Minimum Age of Person Employed by Contractor

(a): No contractor shall employ

- Anypersonwhoisunderageof18years.
- Whodoesnotproduceavalidcertificateofvaccinationagainstepidemicdeceasesinrespect ofhimself/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 or other authority is authorized 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 India 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 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 27. CONTRACTOR NOT ENTITLED TO ANY CLAIM OR COMPENSATION FOR DELAY IN EXECUTION OF WORK INBORROW PITS.

The contractor shall not be entitled to claim compensation if there is any delay in the execution of the work on account of water standing in borrow pits and Compartments. The rates are inclusive for hard or cracked soil, excavation in mud, sub-soil water or water standing in borrow pits and no claim for extra rate shall be entertained, unless otherwise specified.

Clause 28. METHOD OF PAYMENT OF BILLS

Payment to contractors shall be made by RTGS 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 SALES TAX AND LABOUR CESS AND ROYALTY

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

(b) When there is a change in existing taxes from time to time i.e. upward or downward is admissible accordingly

(c) 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 cum Estate officer for stacking materials should be paid by the contractor.

Clause 31. IMPORTANCE OF SAFETY

In addition to Contractor's Contractual Obligations on Safety as per the relevant clauses stated, The Contractor shall comply with all safety standards to the satisfaction of the Employer's Representative.

In respect of all labour, directly or indirectly employed on the project for the performance and execution of the Contractor's Work under the Contract, the Contractor shall at its own expense arrange for all the safety provisions as listed in (i) Safety codes of C.P.W.D. and Bureau of Indian Standards, (ii) The Electricity Act, (iii) The Mines Act, and Regulations, Rules and Orders made there under and such other acts as applicable. Precautions as stated in the safety clause are the minimum necessary and shall not preclude the Contractor taking additional safety precautions as may be warranted for the particular type of work or situations. Also mere observance of these precautions shall not absolve the Contractor of his liability in case of loss or damage to

property or injury to any person including but not limited to the Contractor's labour, the Employer's, Architect's, Employer's Representative's and Project Manager's representatives or any member of the public or resulting in the death of any of these.

The Contractor shall institute and implement to the satisfaction of the Project Manager a construction safety programme, including:

1 Preparinga Site-specific written safety programme consistent with the EHS Plan, Indian law and best practices.Asaminimum,theprogrammeshallrequireapplicablesafetyequipmentforallworkers,useof barriersandbarricadesaroundpotentiallydangerousareas,protectionofworkersworkingunderelevated conditions, accident reporting, first aid provision set.

2 Weekly safety reviews and 'risk assessments' shall be carried out in conjunction with the Project Manager and the Employer in order to identify potential safety hazards and to mitigate against them.

3 Attendingweeklyorasscheduledsafetymeetingsatsiteconductedbythesitesafetyrepresentativeofproject manager

4 The Contractor will be required to provide all personnel entering the Site an Identity and safety rules card and verbal explanation of the safety programme.

5 Requiring all Sub-Contractors and other workers under the responsibility of the Contractor (including the Vendors or later phases of the construction of the Project) to adhere to the written safety programme as per approved format.

Experienced safety officers with adequate number of supporting personnel shall be appointed by the Contractor for full time on the site during the Contract period.

NON-COMPLIANCE OF REGULATIONS

If the Project Manager or the Employer's Representative notifies the Contractor of non-compliance with the foregoing regulations, the Contractor shall immediately, if so directed, or in any event not more than eighteen (18) hours after receipt of such notice, make all reasonable efforts to correct such non-compliance. If the Contractor fails to do so, the Employer may suspend all or any part of the Work. When the Contractor has undertaken satisfactory corrective action, Employer shall lift the suspension of the Work. The Contractor shall not claim any extension of time to complete the Work or additional fees due to any such work suspension.

The Client reserves the right to levy penalty if the safety norms such as not wearing helmets, safety gloves/belts/shoes/jackets. etc., even after a written notice by the enforcing authority, a penalty of Rs.10,000/- per day per event or till the safety norms are adhered to in addition to stopping of work till the safety norms are adhered

Clause 32Refund of Security Deposit (EMD & SD):

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

Clause 33<u>BAR CHART / CPM CHART:</u>

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

9.THE ARTICLES OF AGREEMENT

This Agreement is made at Bangalore, on this **XXth day of MONTH** in the year **TWO THOUSAND AND TWENTY FOUR (XX.XX.2024**).

BY AND BETWEEN

INDIAN INSTITUTE OF SCIENCE herein referred as IISc, a Trust registered under the Charitable Endowments Act, 1890, a deemed University and an autonomous Institution funded by the Ministry of Education, Government of India having its office at **Sir C.V Raman Road, Malleswaram, BANGALORE 560 012**, represented by the **Registrar IISc**, Bangalore (hereinafter referred to as the IISc which expression shall unless repugnant to the context or meaning thereof, mean and include its successors in interest, trustees and permitted assigns) of the ONE PART

AND

M/s xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx Bangalore – 56003xx, hereinafter referred to as the "CONTRACTOR", (which expression shall unless repugnant to the context or meaning thereof, mean and include their partners, their respective heirs, executors, administrators and assigns) on the OTHER PART.

RECITALS

A.WHEREAS the IISc is desirous of getting the work of **"Providing 6 Nos Capacity Passenger Lift including all civil and Electrical works at Hoyasala Guest House at IISc Bangalore".** "(hereinafter called the work) executed by the Contractor at the rates quoted by him amounting to Rs.xxxxxxxx (Rupees xxxxxxxxxxxxxxxxxxxxxx only) Inclusive of all Taxes which is xxx% Above/Below the estimated amount put to tender.

B. 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, to the satisfaction of the IISc, Bangalore

NOW THIS AGREEMENT WITNESSETH AND THE PARTIES HERETO AGREE AND SOLEMNLY AFFIRM 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 **4 Months** for the work after 10 days of issuance of work order or from the date of handing over of site, whichever is later.

2. IISc 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 work 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 compensation an amount equal to one percent, or such smaller amount, as the Director, Indian Institute of Science (whose decision 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 scheduled dates.

4. The contractor shall ensure good progress during the execution of the work be bound in all cases in which the time allowed for any work exceeds one month (save for special jobs) to complete Mile stone-1 i.e.15% of the whole work before the time allowed under the contract has elapsed, Mile stone-2 35% of the work before the time has elapsed, Mile stone-3 60% of the work before the time has elapsed, Mile stone-4 80% of the work before of the time has elapsed,100% of the work before completion 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 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 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 (10%) percent of the estimated value of the contract as shown in the tender, provided further that in the event of contractor making up the short fall 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.

5. The Engineer in charge shall review the progress of all works with the contractor once every week. Such a review shall take into account the programme fixed for the previous week, obligations on the part of the Institute for issue of drawings etc., and also the obligations on the

part of the Contractor. The review shall also examine the accumulated delays by the contractor if any and mitigation measures proposed by the contractor to overcome the delay. 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 IISc and the contractor. This record should be signed in full and dated both by the Project Engineer and the Contractor.

6. The Director, Indian Institute of Science, without prejudice to its 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 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 unworkmanlike 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 they will be unable to secure completion of the work by the date for completion of the work or they had 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.

The Director of the Institute shall have following powers:

a) To determine or rescind the Contract as aforesaid (in which termination or recession notice in writing to the Contractor underhand 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.

(2) To employ labor paid by the Institute and supply materials to carry out the work or any part by 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.

(3) 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 their 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 them by reason of 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 of action is taken under any of the provisions, aforesaid, the contractor shall not be entitled to recover or be paid any sum for work thereto/for actually performed under this contract unless the Project Engineer-cum-Estate Officer, CCMD has certified in writing the performance of such work and the value payable in respect thereof and they shall only be entitled to be paid the value so certified.

7. The schedules above mentioned include the General Rules and Directions to Contractors and the following documents, viz.,
   i) Letter of Intent
   ii) Letter of Acceptance
   iii) Work Order
   iv) Conditions of Contract
   v) Contractor's Bid – Bill of Quantities
   vi) Technical Specifications
   vii) Drawings
   viii) The pre-Bid meeting proceedings and corrigendum
   ix) Any other document listed in the Contract Data as forming part of the contract shall form an integral part of the agreement and the decision of the Project Engineer-cum-Estate Officer, CCMD in reference to all matters of a dispute as to material and workmanship shall be final and binding on both the parties.

8. The IISc reserves 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 violate this agreement.
9. 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.
10. In the event the contractor or their employees, agents, sub-contractors deface or destroy the property or the establishment belonging to IISc, the same shall be made good by the contractor at their own expenses.
11. The Contractor shall ensure cleanliness at the premises of IISc ensure cleaning of site and removal of debris every week. In any event the contractor ceases to comply the foregoing the IISc shall ensure the site cleaned at the expense of the contractor.
12. The Contractor shall at all time be responsible for the safety of their employees, agents, sub-contractors, and in any event during the commission of work or in their due course of work the IISc shall not be held responsible. The contractor shall defend, indemnify and hold the Institute harmless from any liability or damage, law suits, penalties imposed by any State or Central Government or statutory body or by a third party for reasons of violation of any of statutory provisions or requirements by the contractor.
13. The Contractor shall adhere to the working conditions and its scope strictly and any act not in confirmation with the scope of work which is mutually accepted by both the parties shall only be done after prior approval and acceptance in writing by the Director.
14. The Contractor shall at any time be responsible for the completion of work in time, also the contractor shall be responsible to submit the final bill within one month after completion of the work.
15. Notwithstanding anything contained in the tender submitted by the contractor, all the clauses of this agreement shall be binding on both parties.
16. 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 IISc, unless specific written acceptance thereof is furnished by the IISc. Notwithstanding the foregoing, no verbal agreement or inference from a conversation with any office

members/representatives/employees of the IISc before, during, or after the execution of the agreement, shall in any way affect or modify any of the terms/obligations contained herein.

17. In the event the contract is terminated by the IISc due to any afore mentioned act/omission on the part of the contractor, or for any reason whatsoever, the IISc 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.

18. This agreement can be terminated by IISc with the prior written notice of Seven (7) days in the event of a breach of any of its terms of this agreement and even otherwise this Agreement may be terminated by IISc by giving a minimum of 7 days prior written notice to the Contractor.

19. The IISc shall be indemnified for all losses due to commissions and omissions of persons deployed by the contractor. If any loss or damage is caused to the IISc on account of any negligence, carelessness, acts of omissions. commissions of contractors, its 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 or Central Government or statutory body or by a third party for reasons of violation of any of statutory provisions or requirements by the contractor. The IISc 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 IISc shall be completely indemnified accordingly.

20. The contractor shall pay wages directly to its personnel The contractor shall also ensure that no amount by way of commission or otherwise is deducted from the wages of the workmen. The contract labourers deployed by the agency shall not involve in any theft/pilferage/damage to Institute property. After necessary investigations, if proved that the contractor or their personnel are responsible for the incident, the contractor is liable and will be penalized to the extent of the value of the loss and additionally Rs. 50,000/- for each such incident.

21. All terms and conditions, the scope of work, and other conditions as mentioned in the tender document will be diligently complied by the contractor. The terms and conditions, the scope of work, and other conditions mentioned in the tender documents shall form a part and parcel of this agreement.

22. The Contractor hereby agrees and affirms that during or subsequent to the performance of the duties under this Agreement, the Contractor shall maintain confidentiality and shall not divulge, communicate, use or appropriate any of the IISc Information, except to the extent necessary for the Contractor to fulfill his obligations or duties to the IISc under this Agreement. The Contractor shall not cause transmission, removal or transfer of tangible embodiments of, or files from the IISc place of business, without the prior written consent of the IISc and shall not disclose any information of the IISc to any third part

23. In case of disputes 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, IISc.

24. **COURTS:**

Courts of appropriate jurisdiction situated in Bangalore City shall have exclusive jurisdiction. Any dispute or difference arising between the parties to the agreement in relation to any of the matters specified herein, shall be settled in the Courts of appropriate jurisdiction situated in Bangalore City which shall have exclusive jurisdiction in regard to any matter arising under or in relation to this agreement. Laws of India and the State of Karnataka, shall be applicable in this regard

25. **GOVERNING LAW**

This Contract shall be governed by the Law of India for the time being in force

IN WITNESS WHEREOF the parties hereto have set their respective hands the day and the year here in above written.

In the presence of:
Witness 1:

Signed by for and on behalf of the said Contractor.

(Company Name)

In the presence of:
Witness 2:

Signed by for and on behalf of the IISc.

REGISTRAR
INDIAN INSTITUTE OF SCIENCE
BANGALORE-12

MEMORANDUM OF WORK

INDIAN INSTITUTE OF SCIENCE, BANGALORE-12
ITEM RATE TENDER FOR WORK

1.	General Description	Providing 6 Nos Capacity Passenger Lift including all civil and Electrical works at Hoyasala Guest House at IISc Bangalore
2.	Estimated Cost	**Rs.29,93,238.71**
3.	Earnest Money	**Rs.59,864.77**
4	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
5	Frequency of interim Certificate and payment	Once every month.
6.	Further Security Deposit	5.5% on the running account bills and final bill in addition to Earnest Money Deposit. When the 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 2 of Sl.No.1.
5.	Time allowed for the completion of work in all respects from the date of commencement of work	**4 Months**
6	Bills Of Quantities.	As per enclosure.
7	Defects liability period /release of security deposit.	The security deposit lodged/paid by a contractor shall be refunded to him after the final bill is paid or after Twenty Four **24 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.
8	Period for payment of Running Bill.	Four weeks from the date of submission of each Running account bill by the Contractor.
9	Period for submitting the final Bill.	One month from the date of virtual completion of the work by the Contractor.
10	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/requirements and directions of the Project Engineer-cum-Estate Officer, CCMD

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.

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.59,864.77 (Rupees Fifty-Nine Thousand Eight Hundred Sixty-Four 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 XX **day of XX 2024**.

Signature of the Contractor

Witness to Contractor/s Signature:
NAME
ADDRESS
OOCCUPATION

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

REGISTRAR
INDIAN INSTITUTE OF SICENCE
BANGALORE.

Indian Institute of Science, Bangalore-12
A P P E N D I X

1.Name of the work	Providing 6 Nos Capacity Passenger Lift including all civil and Electrical works at Hoyasala Guest House at IISc Bangalore
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	**4 Months**
4.Frequency of interim Certificate and payment	Once in every month.
5.Further Security deposit	**5.5%** on the running bills and final bill in addition to earnest money deposit. When the 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 Rs.1.00 Lakh may, at the request of the contractor, be released to him against the production of bank guarantee issued from a Nationalised /Scheduled Bank only for an equal amount in the prescribed form. The bank guarantee should be valid till the completion of the defect liability period.
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 Twenty Four 24 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.

10. REFERENCES

EARTH WORK - IS CODES		
1	IS-1200 (Part 1)	Method of measurement of building and Civil Engineering Works.
2	IS 1200 (Part 1)	Method of measurement of earth work
3	IS 1200 (Part-27)	Method of measurement of earth work (by Mechanical Appliances)
4	IS 4988 (Part IV)	Excavators
5	IS 12138	Earth moving Equipment's
6	IS 3764	Safety code for excavation work
7	IS 4082	Recommendations of stacking and storage of construction materials at site
CONCRETE WORK - IS CODES		
1	IS 383	Specification for coarse and fine aggregate from natural sources for Concrete.
2	IS 456	Plain and reinforced concrete - Code of practice
3	IS 516	Method of test for strength of concrete
4	IS 1199	Method of sampling and analysis of concrete
5	IS 1200 (Part II)	Method of measurement of building and civil engineering work (concrete work)
6	IS 2386	Method of test for aggregates for concrete Part I to Part V
7	IS 4656	Specification for form vibrators for concrete.
8	IS 456	Code of Practices for plain and Reinforced concrete.
9	IS 516	Method of test for strength of concrete.
10	IS 1200 (Part II)	Method of measurement of building and civil engineering work – concrete work
11	IS 1791	Specification for batch type concrete mixes
12	IS 4925	Batch plants specification for concrete batching and mixing plant
13	IS 4926	Ready – Mixed Concrete
14	IS 10262	Recommended guidelines for concrete mix design
15	IS 13311 (Part I)	Indian standard for non-destructive testing of concrete. Method of test for ultrasonic pulse velocity
16	IS 13311	Indian standard for non-destructive testing of concrete. Method of testing by rebound hammer.
STRUCTURAL STEEL WORK - IS CODES		
1	IS 226	Structural steel (Standard quality)
2	IS 800	Code of Practice for use of structural steel in general building construction.
3	IS 801	Code of practice for use of cold formed light gauge steel structural member's in general building construction.
4	IS 806	Code of Practice for use of steel tubes in general building construction.
5	IS 808	Dimension for hot rolled steel sections.
6	IS 813	Scheme of symbols for welding.
7	IS 814	Covered electrodes for metal arc welding of (Part I & II) structural steel.
8	IS 816	Code of practice for use of metal arc welding and general construction in mild steel.
9	IS 822	Code of Practice for inspection of welds.
10	IS 961	Structural steel (high tensile)

11	IS 1120	Coach Screws.
12	IS 1149	Specification for light tensile steel rivet, bars for structural purposes.
13	IS 1161	Steel tubes for structural purposes.
14	IS 1182	Recommended practice for Radiograph examination of fusion welded butt joints in steel plates.
15	IS 1200	Method of measurement in Building Civil Engineering work.
16	IS 1239	Mild steel tubes, tubulars and other wrought steel fittings
17	Part I	Mild Steel
18	Part II	Mild steel tubulars and other wrought sheet pipe fittings.
19	IS 1363	Black hexagonal bolts, nut and black hexagon screws product of Grade C (size range M25 to M64) (Part 1 to 3).
20	IS 1365	Slotted counter sunk screws.
21	IS 1367	Technical supply conditions for threaded fasteners.
22	IS 1977	Structural steel (ordinary quality)
23	IS 2016	Plain washer.
24	IS 2062	Structural steel (fusion welding quality)
25	IS 2595	Code of practice for Radiographic testing.
26	IS 4000	High strength bolts in steel structures Code of practice.
27	IS 4923	Hollow steel sections for structural use.
28	IS 5624	Specification for foundation bolts.
29	IS 6227	Code of practice for use of metal arc welding in tubular structure.
30	IS 7215	Tolerances for fabrication of steel structures.
GI SHEET FIXING		
1	IS 277	Galvanised steel sheets (plain and corrugated)
2	IS 1367 (PT - 13)	Technical supply conditions for threaded steel fasteners pt.13 hot dip galvanized coating on threaded fasteners
3	IS 1200 (PT.IX)	Method of measurements of building and civil engineering works Part - 9 Roof covering (including cladding)
DEMOLISHING WORK		
1.	IS 1200 (Pt - XVIII)	Method of Measurements of Building and Civil Engineering Works (Part -XVIII) Demolition and Dismantling
2.	IS 4130	Demolition of Buildings-

ABBREVIATIONS:

The following abbreviations wherever they appear in the specifications, shall have the meaning or implication hereby assigned to them:

Mm	Millimetre
Cm	Centimetre
M	Metre
Km	Kilometre
Mm /sqmm 2	Square Millimetre
Cm /sqcm 2	Square centimetre
Dm /sqdm 2	Square decimetre
M /sqm 2	Square metre
Cm / cubic cm 3	Cubic centimetre
Dm / cubic dm 3	Cubic decimetre
M3/cum 3	Cubic metre
Ml	Millilitre
Kl	Kilolitre
Gm	Gram
Kg	Kilogram
Q	Quintal
T	Tonne
Fps system	Foot pound second system
°C	Degree Celsius temperature
Fig	Figure
Re/Rs	Rupee/ Rupees
No	Number
Dia	Diameter
AC	Asbestos cement
CI	Cast Iron
GC	Galvanised corrugated
GP	Galvanised plain
GI	Galvanised iron
PVC	Polyvinyl chloride
RCC	Reinforced cement concrete
SW	Stone ware
SWG	Standard wire Gauge

11. TECHNICAL SPECIFICATION

The work shall be carried out as per latest CPWD/KPWD Specificationsas amended from time to time and relevant IS codes. In case of discrepancy between technical specification and BOQ, the BOQ prevails.

GENERAL SPECIFICATIONS

PART -1 Specifications for Civil Works

1.0 EXCAVATION
2.0

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 (deflectionlimited 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 ofIS : 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 keptclean and free from pitting, loose rust millseale- oil, grease- earth paint orany 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 atleast 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 methacrylate or cellulose butyrate, tithe surface from wet cement during installation. This coating shall be removed on completion. Before handing over, the aluminiumwork shall be washed with mild solution of non-alkisoap 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 theentire 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 meone 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.

9.0FLOORING:GRANOLITHIC FLOORING

9.1.1General:

The flooring shall be of specified thickness and shall consist of1:2:4 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

9.1.2Laying 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 of6mm 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 1:5wide. 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 methodsacceptable 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 eft). 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 compound 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 centimetre 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 side's 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	:	Centrifugally cast (spun) cast iron pressure pipes for 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 be 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 upto the distance of 50Km as per the directions of Engineer in Charge.

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 walling 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, and 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 saidearlier.

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.

DETAILED TECHNICAL SPECIFICATION FOR ELECTRICAL WORKS

The following detailed Technical Specification pertains to the above and shall form Part of the Contract and the same shall be followed in work. The item/works which are not covered under this specification, CPWD/ State PWD specifications shall be followed for the same.

Samples of all materials like conduit, wires, cables, DB's, light fittings, switches, sockets, plug & sockets, MCB, MCCB etc., and any other electrical items shall be submitted to the Engineer-in- charge for obtaining approval prior to procurement.

GENERAL REQUIREMENT**:** ELECTRICAL SUPPLY SYSTEM:

- 415V AC - +10% to -10%
- Frequency - 50Hz +5% to -5%
- Combined Voltage & frequency - +10% to -10%
- Illumination/Space heater power supply -240V +10% to -10% , 1Ph AC

DISTRIBUTION BOARDS

CONSTRUCTIONAL FEATURES

a) Lighting and Power panels (general purpose panels for safe area) shall be made of 1.6mm thick sheet steel and shall be dust and vermin proof. All metal surfaces shall be cleaned free of rust, given a coat of red –oxide primer and finished with two coats of epoxy based paint of shade 632 of IS 5.

b) Panels shall be indoor/outdoor type as specified. Indoor type panels shall have IP42 degree of protection and shall be suitable for surface or flush mounting on wall surface as specified. Lighting and power panels located outdoor shall be IP55 weather protected and shall also preferably have integral canopy for additional weather protection. The canopy shall be made of 2mm thick galvanized sheet steel or FRP where these are separate from the equipment.

c) Lighting and Power Panels shall have TPN incoming feeder and TPN/SPN outgoing feeders. Lighting circuit feeders shall be rated for 10amps and power circuit feeders shall have current rating of 16 amps.

d) Panels shall be equipped with phase and neutral bus bars of required current carrying capacity.

e) The outgoing feeders shall be provided with single pole miniature circuit breakers (MCBs).

f) Miniature circuit breakers shall be mounted in such a way that the operating levers project outside the front Bakelite cover plates for ease of operation. A hinged door to cover the operating knobs shall be provided.

g) In addition, a circuit diagram indicating incomer details and outgoing details viz. Circuit number, circuit rating and load connected and details of the load shall be pasted inside the panel.

h) Also a laminated copy of drawing shall be provided inside the panel in a suitably designed pocket.

i) Two external earthing studs for connection to the plant earthing grid shall be provided on the panel. Further, the panel shall be provided with an earth bus bar

with terminal studs for connection to the third core of each outgoing circuit.

j) Each circuit phase and neutral shall be given ferrule numbers. Complete wiring inside the panel, shall be neatly bunched with PVC tape and button.

k) Sufficient terminals shall be provided in the terminal block so as to ensure that not more than one wire (core) is connected to a terminal.

l) The panel shall have knock out holes or removable gland plate for the entry of incoming and outgoing conduits or cables.

m) Wherever the size of incoming cable to lighting, power panels/ MDB is more than 35 sq.mm, a suitable cable adapter box shall be provided and attached to the panel.

n) Sufficient space shall be provided (minimum 300 mm) between gland plate and the bottom of terminal block for easy termination.

PANELS/BOARDS' COMPONENT EQUIPMENT

a) Molded case circuit breaker (MCCB)

- TPN quick break MCCB shall confirm to IS: 13947 Part 2/IEC
- 60947 Part 2. MCCB shall be of thermal magnetic type.
- MCCBs shall be provided with common trip bar for simultaneous tripping
- of all poles. Shrouded terminals shall be provided.
- 2NO + 2NC auxiliary contacts.

b) SWITCHES/MINIATURE CIRCUIT BREAKERS (MCB)

- Switches/MCBs shall be hand operated, air break, quick make, quick break type conforming to applicable standards.
- The switch shall be protected by fuse and the MCB shall be provided with overload/short-circuit protective device for protection under overload and short- circuit conditions. The minimum breaking capacity of MCBs shall be 10 kA rms. at 415 V/110 V D.C.
- Switch shall have provision for locking in both fully open and closed positions. MCBs shall be provided with locking facility.
- The connections between switch and fuse shall be insulated and all live connections shall be shrouded.

LABELS & DIAGRAM PLATE

a) All door mounted equipment as well as equipment mounted inside the switchboard/panels shall be provided with individual labels with equipment designation/rating. Also the boards/panels shall be provided on the front with a label engraved with the designation of the board/panel.

b) Labels shall be made of non-rusting metal, 3-ply lamicoid or engraved PVC.

c) Inside the door of the 1 phase ways lighting panels a circuit diagram/description shall be fixed for reference and identification.

LIGHT CONTROL SWITCHES

a) Light control switches of ratings and types i.e. decorative/industrial shall be supplied as required. The switches shall be suitable for use on 240V, 1-Ph, and 50Hz supply.

b) Switches shall be of flush type for mounting behind an insulated plate or

incorporated with a switch plate for mounting flush with the surface of wall or switch box/suitable enclosure. The switch box/enclosure may be recessed into or mounted on a wall as per the requirement of project layouts.

c) The size of enclosure boxes shall be chosen to accommodate the number of switches to be installed at the particular location. The enclosures shall be 18 gauge sheet steel galvanized. The enclosure box shall be covered with Perspex/insulating cover. An enclosure intended for surface mounting shall not have holes or gaps in its sides other than those expressly provided for cable entry.

WIRING IN CONDUITS AND INSTALLATIONS OF FITTINGS / FIXTURES

a) The following colour codes shall be followed for the wiring (3 phase – 4 wire, 1 phase – 2 wire)

•R' phase	:	Red colour
•Y' phase	:	Yellow colour
•B' phase	:	Blue colour
•Neutral'	:	Black colour
•Earth lead'	:	Green colour

b) No wiring conductor shall be drawn in the conduits until all the work of any nature that may cause damage to wires is completed.

c) 2.5sqmm copper wires with one run for earthing. 16A to 20A power socket wiring shall be made with 4.0sqmm copper wires with one run for earthing. Above 20A power wiring shall be made with adequate size copper wires/ armored power cables as required or as directed.

d) Wiring shall be completed as per the looping system where phase wires are looped at the switches and the neutral at the fittings.

e) ***The jointing of wires either in conduit or in junction box is not permissible and strictly prohibited.*** End termination/ connection of Wires/ cables of 6.0sqmm& above size shall be made by providing suitable tinned copper lugs by crimping.

f) All light fittings, fans etc., shall be controlled individually. However corridor lighting may be group controlled as required or directed. Emergency lighting shall be executed as per the instructions. In case occupancy sensors/ LMS is provided for lighting control, then suitable groupcontrol wiring shall be made as required.

a. EARTHING

i. The earth electrodes shall not be situated less than 1.5 meters from any building. Care shall be taken that the excavation for earth electrodes shall not affect the foundation of the building. The location of the earth electrodes shall be such that there is reasonable chance of retaining moisture as far as practicable. Entries/ pavements and road crossings shall be avoided for locating earth electrodes.

ii. All materials used for connecting the earth lead with earth electrode shall be of GI for GI earthing and copper for copper earthing as directed.

iii. No individual earth electrode shall have a greater ohmic resistance than 10ohms asmeasured by an approved earth testing apparatus and collective earth resistance of the mat with all the electrodes connected shall be not more than 02 ohms.

iv. The earth lead from earth electrode onwards shall be buried in ground to a depth of 50 cm below ground level.

v. All conduits (whether recessed or surface) shall be permanently connected to earth by suitable earthing clamps fixed on the conduit near entry to switch gang boxes, light fittings and all electrical devices.

vi. The body of all electrical devices like light fittings, ceiling fans, exhaust fans, fan regulators, switch gang boxes, 5 A sockets etc., shall be properly earthed by running 1.5sqmm size PVC insulated single core copper conductor cable/ as specified in the SOQR/ drawing. The earthing wire shall originate from Distribution Board.

vii. All joints in earth mat or earth lead to earth mat shall be made by welding/ clamping or by bolts and nuts. No other type of joint is acceptable. All welded joints for earthling system shall be thoroughly cleaned and covered with epoxy compound, which is acid/ alkali resistant.

viii. All Distribution boards shall be connected to earth grid/ earth electrode by running twonumbers of required size earth leads.

ix. The armour of the cables and cable glands shall be effectively earthen at both terminations.

x. Earth wire/ flat should never be used as Neutral. All the joints shall be over lapped at leastfor 100mm by joining with welding or by double bolt & nuts, spring washers etc.

xi. The earth wire/ earth bus should not be laid over floor. They should be supported andprotected against any probable mechanical damage.

xii. All earth connections should be scooted as far as possible. Where more than one earth leads are connected, a single socket should be used for connection.

xiii. The earth electrodes should be minimum three meters apart from one another.

xiv. Each earth lead should be connected individually to the earth clamp. Each connectionshould always be visible for easy inspection.

xv. Each earth electrode should be identified permanently by engraving on the inner side of thewalls by wet cement with reference to earth leads connected to it.

b. POWER DISTRIBUTION BOARDS (PDB/MDB/SDB/MCC/PCC):

i. The PDB shall consist of identical unitized cubical compartments placed side by side to form acompact switch board assembly of compartments, floor mounted type with base frame.

ii. The panel shall be extendable type with rigid angle iron frame work for body of the panel and complete. Internal components and cabling access shall be from the front/either sides of the panel.

iii. PDB shall be designed for dust and vermin proof enclosure as per IP-54 for indoor applications.

iv. The outdoor type PDB shall be provided with suitable rain/weather protections such as canopy,additional double doors etc.

v. Each panel shall be formed of separate feeder compartments for each incoming and out goings in multi-tier non-draw out/draw out as required formation placed one above the other having one side cable alley and other, bus bar chamber.

vi. The board shall be fabricated out of CRCA sheet steel thickness of not less than 16 SWG(1.5mm) for body and 14SWG(2.0mm) for load bearing points.

vii. Each compartment door, cable alley, vertical bus bar chamber etc. shall be provided with non- deteriorating neoprene gasket without any discontinuity.

viii. Suitable mechanical door inter-locks shall be provided for all the compartments for safe operation.

ix. The rating/ type of the incomer and outgoing feeders/switch gears shall be as per the single line diagram & DTS.

x. All feeder compartments shall be labeled with screwed nameplates of area / equipment / distribution board it controls. Name plates shall be of black Perspex sheet with white engraving and of minimum of 3mm thickness. A large nameplate of minimum 300mm x 75mm shall be provided on top of each distribution board to indicate its type & designation. Suitable 'DANGER' board as per relevant IS code shall be provided as required.

xi. Horizontal and vertical runs of bus bars shall be located in separate chambers. The bus bars shall be rigidly supported at intervals of not more than 400mm.

xii. The bus-bar supporting insulator shall be of ribbed construction and shall be of fiber glass/ melamine / DMC /SMC/ FRP. The bus bar chambers shall be completely enclosed and unapproachable to accidental contact from feeder compartment. The connection from the bus bars to individual compartment units shall pass through a rubber grommet.

xiii. The incomer main feeder units shall have facility for locking in OFF position to prevent accidental closing while at work.

xiv. All live points shall be fully shrouded to prevent accidental contact when the doors are in open position. Sufficient space shall be provided at main incomer chamber for termination of the cable.

xv. Main bus bars shall be made of flat aluminium of electrical grade with cross sectional area of one and half times of incoming MCCB/switch rating unless otherwise mentioned in single line diagram.

xvi. The joints in the main bus bars shall be made with minimum 2 bolts using spring washers. The bus bars shall be PVC sleeved. Main incomer terminals shall be extended from MCCB with busbars suitably to terminate two or more cables.

xvii. Bus bars shall be provided with the minimum clearances in the air as specified in IS 4237 for a 500V, 3phase system.

xviii. Separate supports shall be provided for each phase of the bus bars. If a common support is provided for all 3 phases, anti-tracking barriers shall be incorporated and the mounting fasteners suitably insulated.

xix. Bus bars shall be rated for rupturing capacity of 50KA.

xx. One No. of earth bus bars of equal to that of neutral size of aluminum bars extending through out the length of the board shall be provided on the lower parts of the board . Two earth terminals connected to the internal earth bus consisting

of electro-galvanized bolts and nuts and washers to be provided to connect external earth connections.

xxi. The metal parts of all outgoing feeders shall be earthed by connecting to the earth bus using suitable size earth leads.

xxii. Potential circuit wiring shall be carried out with minimum of 1.5 Sq mm 1100V grade PVC insulated copper conductor cable.

xxiii. Current circuit wiring shall be carried out with minimum of 2.5 Sq mm single core 1100V grade PVC insulated copper conductor cable.

xxiv. Before starting the manufacture, dimensional general arrangement drawings, wiring diagrams etc., indicating all the relevant clearances and specifications shall be submitted in three copies. Only after obtaining the approval of Engineer-in-charge, fabrication shall be taken up.

xxv. The entire PDB shall be tested as per relevant IS/manufacturer instructions for type and acceptance tests and three copies of final test certificates shall be furnished.

xxvi. IISC reserves the right to witness the routine tests at manufacturer's works or waive the based on submission of the test certificates. They shall give advance intimation of the date of testingat the manufacturers works.

xxvii. Three copies of the following documents / drawings shall be furnished along with PDB/MCP

xxviii. Complete assembly drawing of the PDB showing plan, elevation, typical sectional views and location of the terminal blocks for external wiring connection.

xxix. General arrangement drawing showing the equipment mounted on each compartment.

xxx. Complete wiring diagram including terminal wiring designation of each compartment.

xxxi. All the components/ switch gears shall be of single make to establish full co-ordination among the switch gear. In the event of fault, the control gear and protection system should be inline with the protection required for safe operation.

xxxii. The incomer side of main MCCB shall be provided with suitable rating tinned copper spreader bus bar and extension flat suitable for making connections of incomer cables.

xxxiii. **Factory Inspection: Tests and Inspection of Lift items**:

b) The authorized representatives from IISc may visit the works during manufacture of equipment to assess the progress of work as well as to ascertain that only quality raw materials are used for the same. They shall be given all assistance to carry out the inspection without any extra cost.

c) To conduct factory test the testing facility shall be arranged as per requirement as stated in the Tender. For factory test, the cost of travelling to the factory, lodging & boarding expenditure to be included in the rate quoted.

1.1 **LIFT COMPONENTS:**

The electric lift shall comprise of the following equipment and auxiliaries, but not be limited to:

1.2 Permanent magnet motor.

1.3 Microprocessor based, simplex/duplex, selective collective control with ACVVVF drive with remote monitoring facility & closed loop control using speed encoder on the motor.

1.4 Traction sheave.

1.5 Regenerative machine brakes.

1.6 Suspension ropes/flat PU belts and their fixtures, as per manufacturer's standard.

Counterweight and counterweight frame, guides, guide shoes, fixtures.

1.7 Lift car complete with car frames, enclosure, platform guide shoes, fixtures, car operating panel.

1.8 Car guides and fixtures.

1.9 Car doors.

1.10 Landing doors with locking device.

1.11 Car buttons in landing.

1.12 Safety gears.

1.13 Governors.

1.14 Spring Buffers.

1.15 Electric control panels.

1.16 Car operating and indicating equipments.

1.17 Electric interlock devices for landing & car doors.

1.18 Terminal stopping & final limit switches.

1.19 Wiring.

1.20 Anchor bolts, base plates, nuts, inserts, sleeves, clips, clamps, rails, miscellaneous joints, screws etc.

1.21 Car lights.

1.22 Car fans

1.23 Built in emergency light & alarm unit.

1.24 Intercom (Hands free type)

1.25 Car trailing cables

1.26 Any other parts or components necessary for efficient operation of the lift

1.27 Transportation of equipment to site.

1.28 Site erection, testing & commissioning.

2.0 **STANDARDS**

The following BIS Standards and Codes of Practice with up to date amendments shall generally apply to the equipment and the work covered by this contract.

2.1	IS : 14665 (Part-1)-2000	Electric Traction Lifts – Guideline for outline dimension of Passenger, Goods, Service and Hospital Lifts.
2.2	IS: 14665 (Part-2)-2000	Electric Traction Lifts – Code of practice for Installation.
2.3	IS : 14665 (Part-3)-2000	Electric Traction Lifts – Safety Rules.
2.4	IS : 14665 (Part-4/ Sec 1to 9)-2001	Electric Traction Lifts – Components.
2.5	IS : 4666:1968	Specification for electric passenger and good lifts.
2.6	IS : 1860:1980	Code of Practice for installation, operation and maintenance of electric passenger and good lift.
2.7	IS : 3534	Outline dimension for electrical lifts.
2.8	IS : 2365	Specification for steel wire suspension ropes for lifts

		and hoists.
2.9	IS : 1173	Hot rolled and slit steels tee bars.
2.10	IS : 4289	Specification for lift cables.
2.11	IS : 732 : 1963	Code of practice for electric wiring installations
2.12	IS : 325	Three phase induction motors.
2.13	IS : 4029	Guide for testing of three phase induction motors.
2.14	IS : 4722	Specification for rotating electric machines
2.15	IS : 6362	Designation of method of cooling for rotating electrical machines.
2.16	IS : 800	Code of practice for use of structural steel in general welding construction.
2.17	IS : 814	Covered electrodes for metal arc welding for mild steel.
2.18	IS : 816	Code of practice for the use of metal arc welding for general construction in mild steel.
2.19	IS : 817	Code of practice for training testing of metal and welding.

2.20 All the materials used shall be tested for quality and shall comply with Indian Standard/International specification wherever such standards exist.

2.21 The installation shall be carried out in conformity with the local lift act & rules and of local municipal by laws, and any other statutory regulation enforces from time to time.

2.22 The contractor shall at his own expense arrange for the safety provisions (as per statutory regulation, CPWD Safety code, I.S recommendations, regulations under factory act, wherever applicable and instruction issued from time to time) in respect of all labour employed by him directly or indirectly for the installation of this lift.

2.23 The contractor shall provide necessary barriers warning signs and other safety measures etc. wherever necessary so as to avoid accident during erection. In case of default, appropriate recoveries, as per rules, will be made from contractor.

2.24 The contractor shall also indemnify Dept./User against clauses for compensation arising out of his negligence in this regard.

2.25 The installation shall be carried out in conformity with the local fire regulations and rule there under wherever they are in force.

2.26 The tenderers/bidders shall also consider local and State regulations as in vogue for the design and installation of lifts.

2.27 Wherever appropriate Indian Standards are not available, relevant British and/or IEC Standards shall be applicable. BIS certified equipment shall be used as a part of the Contract.

2.28 In addition, the relevant clauses of the following, as amended up to date shall apply.

a) The Indian Electricity Rules 1956
b) The Indian Electricity Act 1910
c) Karnataka Lift Act 1939
d) National Building Code

3.0 DESIGN REQUIREMENTS:

3.1 General**:**

Unless inconsistent with this specification, the supplier's standard or usual construction is desired. The equipment shall be capable of safe, proper and continuous operation.

3.2 **Electric Supply:**

The available system of electric supply is 415 volts between phases and 230 volts between phase and neutral - 3 phase 4 wire A C 50 Hz system. The amount of power required for elevators and equipment shall be indicated in the tender in the relevant format. Power shall be provided at one point in distribution board near to the lift shaft. a point to be indicated by the tenderer/bidder. Beyond this supply point, all subsequent electrical systems shall be the responsibility of the tenderer/bidder.

3.3 **Driving Mechanism:**

3.3.1 **Lift Machine:**

a. The lift machine shall be suitable for 415 volt, 3 phase 50 Hz AC supply with a voltage variation of +10% and -10% and shall be placed directly above the hoist way on steel beams resting on machine room floor slab.

b. The lift machine shall have high efficiency and low power consumption and shall be designed to withstand peak currents in lift duties. Resilient anti vibration mountings of suitable design shall be provided to minimize noise and vibration transmission.

c. The lift machine shall be gearless type and consist of a motor, electromechanical brake, and sheave all completely mounted on a common bed plate. Roller bearings shall be provided for the sheave shaft to ensure alignment and long bearing life or as per manufacturer's standard proven design. The hard alloy cast iron or steel sheave shall have rope grooves to ensure proper traction and minimum rope wear. Adequate means of lubrication shall be provided for all bearings.

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

3.3.2 **Brake:**

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

3.3.3 **Drive Motor:**

(a) The drive motor shall be Permanent magnet motor suitable to withstand frequent peak current encountered in lift duty and shall have high starting torque and low starting current.

(b) The motor shall be capable of not less than 180 starts per hour without excessive temperature rise.

(c) The maximum temperature rise of the winding shall not exceed 45^0C above ambient temperature when operated under normal condition.

(d) The motor shall carry a nameplate giving full details of its ratings and characteristics.

(e) The motor used shall have Class F insulation and shall be designed for 110% of rated load.

3.4 **CONTROL:**

3.4.1 The lifts shall have microprocessor based, simplex/duplex, selective collective controlled AC variable voltage variable frequency (ACVVVF) drive with closed loop control system. The drive system shall control the starting, stopping, direction of motion, running of the lift motor and application of the brake and/or safety devices in the event of power failure or any other emergency. It shall be so designed as to ensure a smooth and constant acceleration and retardation under all operating conditions.

3.4.2 The controller shall be wall/floor mounted, vertical, totally enclosed cubicle type

with hinged doors on the front to provide easy access to all components in the controller. The cubicle shall be well ventilated such that the temperature inside never exceeds the safe limits of the components at ambient room conditions in the machine room.

3.4.3 The Controller shall be complete with built in protection against the following:

a) Over current
b) Under voltage
c) Over voltage
d) Single phasing
e) Phase reversal
f) Earth leakage

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

3.4.5 The tenderer/bidder shall state clearly the forms of protection provided for each equipment.

3.5 COUNTER WEIGHT:

Counter weight shall consist of cast iron weights as per manufacturers standards, contained in a structural frame and shall be equal to the weight of the car plus approximately 50% of the contract load. Suitable metallic counter weight guard of required length shall be provided at the bottom of the hoist way

3.6 GUIDE RAIL AND GUIDES:

Guide rails of the car and counter weights shall be preferably machined section and comprise of steel toes and grooved fish plates & bolts at the ends and securely fastened to the hoist way frame by heavy steel brackets. Car and counterweight frames shall be provided with suitable lubricating system. The guide rails of the lift shall be fastened to the shaft way frame work and concrete inserts at regular intervals. Adequate packing shall be supplied by the supplier.

3.7 HOIST ROPES:

The car and counterweight shall be suspended by steel wire ropes or polyurethane flat belt with steel wires embedded in it. The rope /belt shall be of continuous length without break or lengthened by splicing.

More than two independent wire ropes shall be used for cage and counterweight with traction drive and each of the drum drives and wire ropes shall be fixed independently to cage and counterweight. Factor of safety for normal working to be taken as 10.

3.8 LIFT CAR:

3.8.1(A) Car platform & flooring for all lifts

Size of car platform shall be of maximum size that could be accommodated in lift well as per code of practice. The platform shall consist of a structural steel frame designed on the basis of rated load covered with a M.S steel plate with the PVC Vinyl floor. The design, colour and quality approved by Engineer- in- charge, shall be laid on and securely fixed to the steel sub-flooring in the approved manner. Temporary wooden platform may be provided over PVC Vinyl flooring for protection, during the construction period.

3.8.2 Top of car shall be designed to support weight of two (2) persons.

3.8.3 The car enclosure for Passenger lifts shall be of stainless steel sheet of Grade 304, 18 SWG thick , brush finish, smooth and free from defects and hand rail on 3 sides and all hardware fittings in s/s. etc.

3.8.4 SS Hand rail and SS kick plate of manufacturer's standard design shall be provided with the approval of Engineer-in-charge.

3.8.5 On the top of the car cage following accessories should be provided:-

a. Up, down & stop push button, & one number single phase 230 V power point.

b. A traveling screen (toe guard apron) as per manufacturers design shall be provided below the level of the car floor to prevent fall of person in the shaft from open doorway entrance.

3.8.6 Auto fan off facility shall be provided, when car is in parking position.

3.9 CAR DOORS:

3.9.1 The car doors for Passenger lifts shall be provided with Centre opening, horizontal sliding SS Doors of Grade 304, in brush / hairline finish with sandwich construction.

3.9.2 The doors shall have automatic Center opening & closing feature. Doors shall have clear opening as per specific requirements. Infra red sensor along the entire door height shall be provided for sensing obstruction while door closing. Also, protective leading edge device, as a backup to infra red sensor, shall be provided, to open the door immediately on sensing impact on the door.

3.9.3 All the car doors shall have a fire resistance of not less than 1 hour.

3.10 HOIST WAY LANDING DOORS:

3.10.1 The Hoist Way landing doors for Passenger lift shall be provided at each landing with Centre opening, SS Door of Grade 304, in brush /hairline finish with sandwich construction.

3.10.2 The doors shall have automatic opening and closing feature in association with car door. Doors shall have a clear opening as per specific requirements. Car will open in front only.

3.10.3 Provision for emergency opening of the landing door by means of a special key should be provided at all floors.

3.10.4 All the landing doors shall have a fire resistance of not less than 1 hour.

3.11 CAR & HOIST WAY OPERATIONS:

3.11.1 The equipment shall be complete with electric door operator with AC VVVF drive for opening and closing of Car & Hoist way landing door. The equipment shall consist of a motor on the lift car to operate the door when the car is stopping at a landing. The Car & Hoist way doors shall be mechanically connected such that both move simultaneously for opening and closing.

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

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

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

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

3.12 Cabin fan/Ventilation:

3.12.1 Pressure fan of approved make and of adequate size shall be provided in the car ceiling. The fan shall be on emergency supply through battery for minimum 30 min back up in case of power failure in each elevator car.

3.12.2 Auto fan off facility shall be provided, when the car is in parking mode.

3.12.3 Tenderer / Bidder should indicate whether forced ventilation will be required in the machine room for control panel and control equipment etc.

3.13 Lighting:

3.13.1 LED Light fixture of approved type and quality shall be provided in the car to provide adequate lighting in the car.

3.13.2 Auto light off facility shall not be provided, when the car is in parking mode.

3.13.3 Suitable outlets shall be provided on the top and bottom of the lift car to install a hand

lamp during maintenance.

3.14 **Emergency Light**:
An emergency light unit using sealed Nickel/Cadmium of equivalent approved makes maintenance free battery power pack with charger/inverter and compact fluorescent lamp to operate automatically and to illuminate the car for minimum 30 minutes in case of power failure shall be provided in each lift car.

3.15 **Alarm Bell:**

3.15.1 An emergency alarm bell, including wiring shall be provided and connected to a plainly marked push button in the car operating panel. The alarm shall be located in the Control and the Security Room and main lift lobby.

3.15.2 The alarm unit shall be solid-state siren type, operated by Nickel/Cadmium maintenance free batteries to give a waxing and waning siren when the alarm button in the car is pressed momentarily.

3.16 **Name plate:**

A name plate shall be fitted in the lift car to indicate the rated capacity of the lift & instructions in Hindi & English as per format given in specifications.

3.17 **OPERATION BUTTONS & INDICATIONS:**

The following operation buttons and indications shall be provided:

3.17.1 **In each Lift Car:**

Stainless steel panel (COP) of suitable thickness flush mounted shall be provided on one side of the door having:-

a. LED luminated push buttons of microprocessor type or touch sensitive glass type corresponding to the floors served. Also all the buttons on the COP shall have Braille inscription.
b. Door open button.
c. Door Close button.
d. Emergency alarm button
e. Emergency Light
f. Two position key operated switch for 'with attendant' and 'without attendant' operation.
g. Ventilation fan ON/OFF switch with auto OFF when car is in parking mode/there are no calls to attend.
h. Built in intercom of the hands free type. Provision only for providing EPABX telephone instrument with cable shall also be kept. Also one number telephone instrument in machine room and one in security room including interconnections.
i. Dynamic car direction display
j. Car position indicator
k. Overload warning indicator

3.17.2 **At Landings:**

The landing fixtures shall be recess mounted on a base junction box in the wall by the side or on top of landing doors as required.

Each landing fixtures shall consist of micro touch type landing call buttons or touch sensitive glass with illuminated call acknowledge signal and illuminated digital type car position indicators on separate stainless steel face panels with brush /hairline finish. The call buttons shall have Braille inscription. At every landing arrival digital car position indicator with gong in indication shall be provided.

The following landing fixtures shall be provided for each lift:

a) Lowest floor

- Up call button
- Digital car position indicators
- Travel direction indicators

b) All floors other than lowest and top most floors
- Button up and down call buttons
- Travel direction indicators
- Digital car position indicators
- Manual by pass key switch for lift landings.

c) The top most floor
- Down call button
- Travel direction indictors
- Digital car position indicators
- Manual by pass key switch for lift landings.

3.18 Control Cabinet (Panel) Construction Feature:

a. The design of control cabinet to be done keeping in consideration of Machine room less lift and shall be sheet steel enclosure of min. 1.6mm thick and shall be dust weather and vermin proof type Sheet steel used shall be of adequate thickness and properly braced to prevent wobbling.
b. Control cabinets shall be free standing floor mounting type with anti-vibratory pads.
c. Control cabinets shall be provided with a concealed hinged door with padlocking arrangement.
d. All doors, removable covers and plates shall be gasketed all around with neoprene gaskets, louvers when provided shall have screens and filters. The screen shall be of fine wire mesh of brass.

e. Cable entries shall be either from top or from bottom.

f. All sheets steel work shall be given standard seven tank treatment and powder coated both inside and outside. The colour of the finishing coat shall be as per IS:5 and as approved by Engineer-in-charge.

3.19 Cabinet Internal wiring:

3.19.1 Control cabinets shall be supplied completely wired ready for Dept. /Users external connection at the terminal blocks. All wiring shall be wired with stranded copper conductor with FRLS properties of adequate sizes to suit the rated circuit current.
The control alarm and indication circuits shall be wired with stranded copper conductor of sizes not smaller than 1.5 sq.mm or as per manufacturer's standards.

3.19.2 Engraved core identification ferrules, marked to correspond with the wiring diagram shall be fitted at both ends of each wire Ferrules shall be fit tightly on the wires and shall not fall off when the wires are removed. Spare auxiliary contacts of all relays, contactors, etc. shall be wired to terminal blocks. All wiring shall be terminated on terminal blocks using solder less crimping type tinned copper lugs. Insulated sleeves shall be provided at all the wire termination. All wiring shall be neatly bunched and dressed without affecting access to equipment mounted within the cabinet. Wiring trough shall be provided for vertical cabinet wiring and for interconnecting wire between front and rear section of the cabinet.

3.19.3 Terminal blocks for control indication etc. shall be suitable for connecting to conductors of Dept./Users cables of following sizes :

a) Control circuits shall be min. 1.5 sq.mm multi stranded copper conductor.
b) CT circuits : min 2.5 sq.mm multi stranded copper conductor.
Terminal blocks shall be numbered for identification and grouped according to function. Terminal block for CT secondary leads shall be provided with short circuiting and earthing facilities.

3.20 **Labels:**
All door mounted equipment as well as equipment mounted inside the control cabinet shall be provided with individual labels, with equipment designation engraved. Also the control cabinet shall be provided on the front with a label engraved with designation of the control cabinet as furnished by Engineer-in-charge.

3.21 **Earthing terminals:**
Control cabinet shall be provided with two separate earthing terminals suitable to receive earthing conductors as per incoming cable size.

3.22 **Earthing :**
The equipment supplied shall be earthed with the following arrangement as per provisions of Indian electricity rules.

a. For equipment grounding the following sizes of copper conductor shall be used. The grounding pads and clamps provided shall be suitable for these conductors.

i. Machine of rating 20 KW to 75 KW– 25 x 3mm tinned copper strip

ii. Machines of rating upto 20 KW- 8 SWG tinned copper conductor.
iii. Control panel – As per incoming cable size.
b. Two independent grounding pads at appropriate end shall be provided on the frame of motors, winding machine, the frame of the control panels etc.
c. The exposed metal parts of electrical apparatus installed in a lift car shall be sufficiently bonded and earthed.
d. One side of the secondary winding of all transformers and their cases shall be earthed.
e. Flexible and screwed conduits shall be properly earthed.

3.23 **SAFETY DEVICES** :

The following minimum safety devices shall be provided, including all requirements of electrical/mechanical nature as per lift inspector.

3.23.1 **Self Leveling** :

The lift shall be provided with a self leveling feature within ± 5 mm.

3.23.2 **Terminal and Final Limits:**

Terminal limit switches shall be provided to slow down and stop the car automatically at the terminal landings, and final limit switches shall be furnished to automatically cut off power should the car travel beyond the terminal landings.

3.23.3 **Terminal Buffers:**

Suitable spring buffers shall be installed/ mounted on steel channels as a means of stopping the car & counter weight.

3.23.4 **Interlocking:**

Adequate interlocking is to be provided so that the car shall not move if the landing doors are even partially open and also the lift is overloaded.

3.23.5 **Car Safety and Governor:**

The car safety shall be provided to stop the car whenever excessive descending speed is attained as per IS.

3.23.6 **Automatic Rescue Device (ARD):**

ARD with batteries shall be provided for the lift other than FIRE elevator, for rescue of passengers, in event of power failure.

3.24 FIREMAN SWITCH:

3.24.1 Each independent lift shall have a Fireman switch with glass front for access by the Firemen. The operation of this switch shall cancel all calls to this lift and will stop at the next nearest landing if traveling upwards. The doors will not open at this landing and the lift will return to the ground floor. In case the lift is traveling downwards when the fireman's switch is operated it will go straight to the ground floor by passing all calls enroute. The emergency stop button inside the car shall be rendered inoperative.

3.24.2 The fireman's switch shall be located adjacent to the lift opening at the lowest terminal floor and shall be at a height of approximately 2 m above the floor level.

4.1**Tests at Site:**

After assembly and erection at site, the lift shall be tested at site before it is put into normal service

The supplier shall be fully responsible for carrying out all the tests including following as listed below in addition to the relevant Indian Standards.

a) Leveling tests
b) Safety gear test
c) Contract speed
d) Lift balance.
e) Car and landing doors locks.
f) Controller.
g) Normal terminal stopping switches.
h) Final terminal stopping switches.
i) Insulation resistance
j) Earthing
k) Ropes
l) Buffers
m) Service temperature rise test.
n) Over load test.

The reports of the aforesaid tests shall be submitted to the Engineer-in-charge. The contractor shall have to obtain necessary clearance from the lift inspector and fire brigade authorities after the complete installation. It will be the responsibility of the lift contractor to get the installation

inspected and passed by the Government Inspector for lifts. Any modification as suggested by inspector for lifts shall be attended by the lift supplier at no extra cost to the department.

5.0 **Drawings & data:**

After award of work, the bidder shall furnish the following drawings and data for scrutiny. All the comments on drawings shall be incorporated without financial burden to department.

a. Control cabinet general arrangement drawing showing plan, front view, foundation details, inside view, terminal block location etc.
b. Schematic wiring diagram of the control cabinet.
c. Bill of material listing, equipment designation, makes type rating etc of the various equipment mounted on the control cabinet.

INSTRUCTIONS TO BE DISPLAYED IN HINDI/ ENGLISH IN THE LIFT CAR AND LIFT LANDINGS PASSENGER LIFT

S.No.	Inside the Car	S.No	Outside the Car
1.	Lift Number……..	1.	Lift Number……..
2.	Capacity … passenger (…… Kg).	2.	Capacity …..passenger (…... Kg).
3.	No Smoking	3.	Please stand in „Q".
4.	Operator push buttons/	4.	Smoking not permitted inside the Car.
5.	Do not lean against lift door.	5.	Passengers travel at their own risk.
6.	Watch before stepping door.	6.	Please keep the lift neat and clean.
7.	Do not panic in the event of break down. Press alarm button and follow instruction of authorized staff.	7.	Does not force open the landing doors.
		8.	Watch before you step into and out of the lift car.
		9.	Heavy articles / luggage not allowed.
		10.	Avoid use of lift during fire.
		11.	Complaints if any may be sent to……
		12.	Hours of operation ……

Additional specifications for passenger lift

Note: -
Bidders to give item wise confirmation/comments against each parameter. Deviations if any shall be clearly brought out in this Performa. Bidders shall fill in the Performa and enclose it along with the tender.

Sr. No.	Items	Requirement as per tender	Item wise confirmation/comment to be filled in by Bidders
A	**General**		
1.1	Number of Lifts	01 lift	
1.2	Capacity	6 passengers (408kgs.)	
1.3	Speed	1 mps	
1.4	Number of Landings	03 stops, 03 levels (0,1&2)	
1.5	Number of openings	3, 0 (F), 1 (F), 2 (F)	
1.6	Travel	9 mtr approx.	
1.7	Machine location/Type	**Machine Roomless** - Gearless	
1.8	Machine details		
	Control	AC Variable voltage variable frequency (VVVF) (Microprocessor control)	
	Operation	Microprocessor Based Simplex Selective Collective Control With / Without Attendent	
	Shaft Type	RCCBW - Reinforced Cement Concrete With Block Work	
1.9	Hoist way dimensions		
	Width (along door)	2000/ Site condition	
	Deep (90^{o} to door)	1500 mm/ Site condition	
1.10	Head room above last landing	4200 mm/ Site condition	
1.11	Pit depth	1600mm/ Site condition	
1.12	Sill projection	MS angle	

	Car/Cabin		
1.13	Car Enclosure	Stainless steel sheet door of Grade 304, 18 SWG thick in brush hairline finish or equivalent & their combination as approved, body smooth and free from defects all hardware fittings in stainless steel etc.	
1.14	Car ceiling	Stainless Steel sheet (Grade 304), 18 SWG thick false ceiling of approved finish with pressure fan and sufficient no. Of LED light fittings as required.	
1.15	Car floor	Car floor/ platform shall consist of a structural steel frame designed on the basis of rated load covered with a M.S steel plate, Including rubber mat floor (minimum 5 mm thick) of required size	
1.16	Car and landing doors	Automatic power operated; center opening SS Door, having minimum opening of 800 mm W x 2000 mm H, horizontal sliding fire rated, , smooth and free from defects, having safety with full curtain integrated infrared door sensor.	
1.17	Car size	To be furnished by the tenderer (shall not be less than as specified in IS) **Minimum 1000 mm (W) x 1100 mm (D)**	
1.18	Automatic rescue device (ARD)	ARD with batteries/UPS shall be provided for the lift for rescue of passengers, in event of power failure.	

B.	PARAMETERS	Requirement as per tender	Item wise confirmation/comment to be filled in by tenderers
1.0	**Machine**		
1.1	Power Supply	AC, 415V/230V, 50 Hz.	
1.2	Acceptable voltage fluctuation	+10 to -10%	
1.3	Rate of acceleration / deceleration	0.6 - 1.5 (adjustable at site)	
1.4	Jerk (m/sec2)	0.7 - 1.5 (adjustable at site)	
1.5	Vibrations in car horizontal/ vertical	12 mg(H)/ 20 mg (V) maximum	
1.6	Noise level in car	48-55 dBA maximum	
1.7	Noise level in machine room at 1 mtr from machine	62 dBA maximum	
1.8	Door noise level while closing and opening at a distance of 1 mtr from car door and 1.5 mtr from floor level	52dBA maximum	
2.0	**Fixtures/signals inside car**		
2.1	Hand rail	As approved by Engineer-In-Charge (One side)	
2.2	Normal lighting	LED recessed type	
2.3	Emergency light and alarm bell (to security room)	With SMF battery operated with charger rated for 1 Hrs.	
2.4	Ventilation	Cross ventilation Pressure Fan	
2.5	Operating buttons and indications	Full length stainless steel operating panel with following buttons and indications.	
		LED Illuminated push buttons of micro pressure type corresponding to the floors served	
		Door open, Door close buttons	
		Emergency stop button if Required as per IS standard	
		Emergency alarm button	
		Two position key operated switch for 'with attendant' and 'without attendant'	
		Ventilation fan ON/OFF switch with auto OFF when there is no call after 120	

		Built in two way intercom of the hands free type.	
		Dynamic car direction display	
		Digital Car position indicator at all landings (to be provided above the car/landing doors)	
		Visual overload warning indicator	
2.6	Music	Trailing cable	
2.7	Voice Synthesizer	Compulsory to be provided	
3.0	**Landing signals**		
3.1	Hall buttons	Self illuminating micro- push type in hair line stainless steel facia plates	
3.2	Car Position	Digital indicator with direction of travel	
3.3	Hall gong	Up/down indicator with single stroke gong/chine at all landings	
4.0	**Safety features**		
4.1	Door safety	Electronic detectors Infra red Screen Sensor.	
4.2	Buffer	Spring Buffer to be provided	
4.3	Overload protection	Overload indicator in COP/ Overload protective device	
4.4	Over travel protection	Terminal and final limit switches to be provided	
4.5	Motor protection	Trip devices for: ➢ Over current ➢ Under voltage ➢ Over voltage ➢ Single phasing ➢ Earth leakage	

4.6	Interlocking of car and hoist way doors	To be provided as per specifications.	
5.0	**Associated Civil and structural items**	All civil and structural items of work associated with erection and operation of lifts shall be provided by the Contractor at his cost including following:	
		Temporary Scaffolding and safety barricades for erection in and around lift hoist ways	
		Bearing plates	
		Buffer supports	
		Chequered plates (for service lift only)	
		Facia plates	
		Ladder in pits	
		Safety railing on top of car	
		Shaft reduction Channels, separators, stretchers etc.	
		Structural foundations etc.	
		Sill projection – MS angle/RSJ/Channel etc.	
6.0	**Fireman's switch**	To be provided at GF	
7.0	**Warranty / Free Comprehensive Maintenance Period**	**ONE YEAR** after completion of work and handing over of the Lifts in satisfactory operating condition as is mentioned in the tender document	
8.0	**Lift Inspection**	After successful completion of the lift, it is the responsibility of the bidder to obtain certificate/licence from lift inspectorate.	

Special Data to be furnished by bidders

Sr. No.	Data to be filled in by Tenderers/Bidders	Passenger lifts
A	**Equipment details**	
1	Machine type	
2	Reduction gear unit ratio	
3	Drive motor data	
I)	KW	
ii)	Starting current (Amp)	
iii)	F.L. Rated current (Amp)	
iv)	Max. No. Of starts per hour.	
v)	Insulation class	
4	Hoist/Governor ropes (no. and size)	
5	Max. Temperature tolerance during peak summer months	
6	Heat release data for machine room equipment	
B	**Special features**	
	Tenderers to confirm Included /Not included in respect of the following	Included/Not Included
1	Auto fan off switch	
2	Fan inside the Car	
3	Over load warning indicator	
4	Dry maintenance free batteries	
5	Pits switch	
6	Doors safety	
7	Additional weight permitted inside the car for interiors	
C	**Performance parameters**	
1	Leveling accuracy	
2	Governor tripping speed.	

CONTRACTOR TO COMPLY WITH LAWS:

In the performance of this Contract, the Contractor shall abide by all existing laws, codes, rules and regulations set forth by all governmental units and authorities having competent jurisdiction over Contractor and/or the work performed by Contractor hereunder. Contractor shall also procure and pay any necessary permits or licenses pertaining to the work performed by Contractor pursuant to this Contract.

All repair, parts replacement or adjustments called for hereunder shall be performed in full compliance with specified laws, standards and codes set by the government with latest edition, including amendments thereto, and with applicable regulations of the state, city and/or local authorities. In case of conflict, the more stringent regulations will apply.

WARRANTY:

Contractor warrants that the elevator/escalator maintenance services will be provided to the IISc in accordance with the terms of this Contract for **one Year**. Contractor shall use its best efforts under the circumstances to remedy any delays, interruptions, omissions, mistakes, accidents or errors in such services and restore any service to compliance with the terms of this Contract.

Contractor to comply with laws:

In the performance of this Contract, the Contractor shall abide by all existing laws, codes, rules and regulations set forth by all governmental units and authorities having competent jurisdiction over Contractor and /or the work performed by Contractor hereunder. Contractor shall also procure and pay any necessary permits or licenses pertaining to the work performed by Contractor pursuant to this Contract.

Certificate of safety

The contractor shall submit a safety certificate of lifts within 10 days of the last day of the annual inspection of the lifts.

Availability of Authorized Representative

The contractor shall ensure availability of his authorized representative at Bangalore to receive emergency calls and take remedial actions. The representative should attend the call immediately to ensure the restoration of the services promptly. If shutdown of any lift continues for more than one day a penalty of Rs. 1000/ per day per lift for delay shall be imposed and the amount of penalty shall be recovered from the Security Deposit or any other sum due to the contractor.

Responsibility of Accident and Hazards:

The contractor shall be responsible for any accident or hazard that take place during the maintenance period of 1 years. He shall also be responsible for payment of compensation and penalties payable to effected parties as a result of legal action. He shall also be responsible for repairs and replacement of damaged parts of the lift and restore services within 7 days failing which penalty @ Rs. 1000/ per day per lift shall be imposed and recovered from bills / deposit or any other sum due to the contractor.

Special Conditions of Contract for free CMC under Warranty period;

A. Details of schedule maintenance/break down shall be entered in the register/service slip & jointly signed by the firm's representative and IISc, Bangalore representative and shall be carried out in the presence of IISC representative.

B. Contractor will have to make 12 visits (01 visit per month) during the AMC period. Beside this, any number of breakdown calls will have to be attended. The response time for such breakdown calls shall not exceeds 24 hours. Beyond this penalty shall be imposed as per penalty clause.

C. Contractor's mechanic shall reach to the site within 24 hour after lodging a complaint. Delay in reporting period shall be recorded and penalty shall be imposed as per the following slab. Above 24 hrs, penalty will be at the rate of Rs. 1000/- per day.

D. Contractor will have to take necessary care and precaution to keep the elevator safe for use and in good working condition. Trained technical staff shall carry out maintenance work.

E. Contractor will have to carry out all customary annual safety tests to examine all safety devices.

F. As it is comprehensive in nature, no payment will be made as an extra for replacement of spare parts etc.

G. No parts or components of the lifts being maintained by contractor shall be removed without prior approval and knowledge of IISC. Any part to be removed from the lift for repair shall be done after approval of the nominated supervisor.

H. Any damage to IISC property while carrying out periodical maintenance and attending break down will be contractors" responsibility.

I. Thorough cleaning of machine room control panel machine unit & hoist way with lift car and pit shall be done once in a month. Which IISC representative shall certify.

J. All the lifts shall be jointly inspected once in three months or before submission of bill. Bill shall be forwarded along with the joint inspection report. Items need replacement shall be complied during the next schedule due.

K. The contractor shall fulfill statutory requirement of annual inspection of lift by Inspector of Government. The inspection fees of lift inspector of state Government shall be paid by the contractor.

L. Contractor shall not only attend the failure but also rectify the cause of failure after investigation.

M. Penalty imposed for late reporting, late replacement of defective parts of lift shall be deducted from the bill of the firm.

NOTE: Contact Details of Independent External Monitors are Provided Below;

- Mr. Najib Shah, Ph no: 9311706358, Email ID: najibshah@hotmail.com
- Mr. MJ joseph, Ph No: 9560697979, Email ID: mohan.joseph@gamil.com

LIST OF APRPOVED MAKES FOR CIVIL WORKS

Unless otherwise specified, the brand / make of the material as specified in the item nomenclature, in the particular specifications and in the list of preferred make attached in the tender, shall be used in the work. In case of non- availability of the brand specified in the contract the contractor shall be allowed to use alternate equivalent brand ofthe material subject to submission of documentary evidence of non- availability of the specified brand and prior approval of Engineer-in-Charge.
Sample/MakeofallthematerialswillbeusedonlyafterapprovaloftheEngineer-in-Charge.

PREFERREDLISTOFMATERIALSTOBEUSEDFORCIVILWORK			
SL.NO.	MATERIAL DESCRIPTION	MATERIAL	
		BRAND	MAKE
1	Ordinary Portland Cement(43/53Grade)	ACC	ACCCEMENTSLTD.
		ULTRATECH	ULTRATECHCEMENTLTD.
		BIRLA	BIRLA CORPORATIONLIMITED
		JAYPEECEMENT	JAYPEECEMENTLIMITED
		J.K.CEMENT	J.K.CEMENTPRIVATELIMITED
		AMBUJACEMENT	AMBUJACEMENTLIMITED
2	Damp Proof Material	FOSROC	FOSROC CHEMICALS INDIA PVT. LTD
		SIKA	SIKAINDIAPVTLTD.
		BASF	BASFINDIALTD.
3	TMTBarsFe-550D (low alloy steel with corrosion resistance properties)	SAIL	STEELAUTHORITYOFINDIALTD.
		TISCON	TATASTEEL LTD.
		VIZAG	RASTRIYAISPATNIGAMLTD.
		JSW	JSWSTEELLTD.
		JSPL	JSPL
4	Plasticiser & Super Plasticiser	CONTRAMENT,POWERFLOW	MCBAUCHEMIE(INDIA)PVT LTD.
		SUNANDACHEMICALS	SUNANDACHEMICALSLTD
		MYKSCHOMBURG	MYK ARMENTS RANGE OF PRODUCTS
		PLASTIMENT,SIKAMENT	SIKAINDIAPVTLTD.
		CONPLASTSP430	FOSROCINDIA
		CHRYSO-HP/DELTA/ OPTIMA	CHRYSOINDIAPVTLTD
		BASF	BASFINDIALTD.
		CICO	CICOINDUSTRIES
		SMART CARE TECHNO PLAST/SMART CARE MAXIMO PLAST	ASIANPAINTSLTD
		ENDURA	H.R.JHONSONS.
		DURABOARDHD100	SUPREMEINDUSTRIES
		STP	SHALIMARTARPRODUCTS

		DURAFILL	SUPREMEINDUSTRIES

5	Adhesive	DUNLOP	INDIATYRES&RUBBERCO (INDIA) LTD.
		VAMORGANIC	VAMORGANICLTD.
		SIKA	SIKAINDIAPVTLTD.
		FEVICOL	PIDILITEINDUSTRIES
		CICO	CICOINDUSTRIES
		PROOFEXOFADHESIVE	FOSROCINDIALTD.
		KERABONDPLUS	MAPEI CONSTRUCTION PRODUCTS INDIA P LTD.
		ASIANPAINTS	ASIANPAINTSLTD
6	Grout	ARDEX	ARDEXENDURADHESIVEINDIA PVT LTD.
		FERROUSCRETE	FERROUS CRETE(INDIA)PVT.LTD
		LATAPOXY	MYKLATICRETEINDIAPVT.LTD
		BASF	BASFINDIALTD.
		FOSROCGP2	FOSROCINDIALTD.
		MYKSCHOMBURG	MYK ARMENTS RANGE OF PRODUCTS
		FUGABELLA,PORCELANA	KEROKOLLINDIAPVTLTD.
		DR.FIXIT	PIDILITEINDUSTRIES
		KERAPOXY	MAPEI CONSTRUCTION PRODUCTS INDIA P LTD.
		WEBER	SAINTGOBININDIAPVTLTD.
7	ReadyMixConcrete	ULTRATECH	ULTRATECHCONCRETE
		ACC	ACCLTD
		RMC(INDIA)	RMC(INDIA)PVT.LTD
		LAFARGE	LAFARGEINDIAPVT.LTD
8	AACBlocks	XTRALITE	ULTRATECHCONCRETELTD.
		AREOCON	HIL
		SIPOREX	SIPOREX
		NUCON	GREEN WAY BUILDING MATERIALS INDIA PVT. LTD
		NCL	NCLVEKA LTD.
		RENACON	RENAATUSPROCONPVTLTD.
9	WoodenFlushDoor Shutters	RAAVELLADOOR	RAAVELLAINDUSTRIALS(P)LTD
		INDIANTIMBERPRODUCTS	INDIANTIMBERPRODUCTS
		KITPLY	KITPLYINDUSTRIESLTD.
		DUROFLUSHDOORS	DUROPLYINDUSTRIESLTD.
		CENTURY	CENTURYFLUSHDOORS

		GREENPLY	GREENPLYINDUSTRIESLTD.
		DEC	DECI&PINDIAPVTLTD.

10	Water Proof Ply wood Commercial ply, Fire Retardant ply and block board	GREENPLY	GREENPLYINDUSTRIESLTD.
		KITPLY	KITPLYINDUSTRIESLTD.
		DUROPLY	DUROPLYINDUSTRIESLTD.
		CENTURYPLY	CENTURYFLUSHDOORS
11	Laminate	GREEN LAM	GREENLAMINDUSTRIESLTD
		CENTUARY	CENTURAYLAMINATES
		MERINO	MERINOLAMINATES
		ARCHIDPLY	ARCHIDPLYINDUSTRIESLTD.
		KITMICA	KITPLYINDUSTRIESLTD.
		MERINO	MARINOLAMINATES
		KITLAM	KITPLYINDUSTRIESLTD.
12	Prelaminated Particle board Exterior Grade	ECOBOARD	ECOBOARD INDUSTRIES PVT. LTD.
		ARCHIDPLY	ARCHIDPLYINDUSTRIESLTD.
		CENTUARY	CENTUARYMDF
		GREEN LAM	GREENLAMINDUSTRIESLTD
13	High Density (HDF) Prelaminated	PERGO	REDFLOORINDIA
		GREEN PLY	GREENPLYINDUSTRIESLTD.
		MERINO	MERINOLAMINATES
14	GlassDoorHardware	DORMA	DORMAKABAINDIAPVTLTD.
		KICH	KICH ARCHITECTURAL PRODUCTS LTD.
		HAFELE	HAFELEINDIAPVTLTD.
		OZONE	OZONEHARDWARE
15	Hydraulicdoorclosers /Floorsprings	HAFELE	HAFELEINDIAPVTLTD.
		GODREJ	GODREJLOCKINGSOLUTION& SYSTEMS
		HARDWYN	HARDWYNHARDWARE
		DORMA	DORMAKABAINDIAPVTLTD.
16	Locks& Latches	GODREJ	GODREJLOCKINGSOLUTION& SYSTEMS
		HAFELE	HAFELEINDIAPVTLTD.
		HARRISON	HARRISONLOCKS
17	Metallic/SteelFire Door	SHAKTHIHORMANN	SHAKTHIHORMANNPVTLTD.
		NAVAIR	NAVAIRINTERNATIONALPVT LTD.
		GODREJ	GODREJSECURITYSOLUTION
		TATA PRAVESH	TATASTEEL
18	FireSmokeSeal	HILTI	HILTIINDIAPVTLTD
		PROMAT	PROMATFIRE&INSULATION (P)LTD

		ATROFLAME	ATROFLAMELTD.
		RAVEN	RAVENGLOBAL

19	FireRatedHardware	DORMA	DORMAKABAINDIAPVTLTD.
		INGERSOLRAND	INGERSOLRAND(INDIA)LTD
		DORSET	DORSETINDUSTRIESPVTLTD
		BACKERSFS	BACKERSFS
		GEZE	GEZEGMBH
20	StainlessSteelScrews	KUNDAN	KUNDANINDUSTRIESLTD
		ALLOY	ALLOYLTD
		GKW	GKWLIMITED
		NETTLEFOLD	NETTLEFOLDSCREWS
		POOJA	POOJASTEELCORPORATION
		ATUL	ATULFASTENERSLTD
21	ButtHingesOpenable Window Shutters	HAFELA	HAFELEINDIAPVTLTD.
		EARLTBIHARI	EARLTBIHARIINDIAPVT LTD
		DORMA	DORMAKABAINDIAPVTLTD.
		DORSET	DORSETINDUSTRIESPVTLTD
		ALUALPHA	ALUALPHAINDIA
22	MildSteelButtHinges/ Piano Hinges	JOLLY	JOLLYENGINEERINGWORKS
		SUPREME	SUPREME
		SASWAT	SASWAT
		DEEPAK	DEEPAK
		SWIFT	SWIFTSCREWS
		GARG	D.P.GARG&COMPANY
		AMIT	LOVELYMETALINDUSTRIESPVT LTD.
		JYOTI	JYOTIARCHITECTURALPVTLTD.
23	StainlessSteelButtHinges	OZONE	OZONEHARDWARE
		DORMA	DORMAKABAINDIAPVTLTD.
		KICH	KICH ARCHITECTURAL PRODUCTS LTD.
		HAFELE	HAFELEINDIAPVTLTD.
24	ConcealedTowerBolt	OZONE	OZONEHARDWARE
		DORMA	DORMAKABAINDIAPVTLTD.
		KICH	KICH ARCHITECTURAL PRODUCTS LTD.
		HAFELE	HAFELEINDIAPVTLTD.
25	UPVC Doors, Door FramesandWindows	FENESTA	FENASTADCMSHRIMAN
		LG	LGINDIAPVTLTD.
		KOMARLING	PROFILE INDIA WINDOW TECHNOLOGY PVT LTD.
		DUROPLAST	DUROPLASTEXTRUSIONPVT LTD.

		NCLVEKA	NCLVEKA LTD.

26	StainlessFriction Hinges	HETICH	HETICHINDIAPVT.LTD
		HAFFLE	HAFELEINDIAPVTLTD.
		SECURISTYLE	SECURISTYLEINDIAPVT LTD
		EARLBIHARI	EARLBIHARIINDIAPVTLTD
		EBCO	EBCO
		ROTO	ROTOFRANKASIA
27	FloatGlass	SAINTGOBAIN	SAINTGOBININDIAPVTLTD.
		ASAHI	ASAHIINDIAGLASSLTD
		PILKINTON	PILKINTONINDIAPVTLTD.
		MODIGUARD	GUJARATGUARDIANLTD
28	ReflectiveGlass	SAINTGOBAIN	SAINTGOBININDIAPVTLTD.
		ASAHI	ASAHIINDIAGLASSLTD
		PILKINTON	PILKINTONINDIA
		MODIFLOAT	GUJARATGUARDIANLTD
29	TemperedReflective /Clear Glass	SAINTGOBAIN	SAINTGOBININDIAPVTLTD.
		ASAHI	ASAHIINDIAGLASSLTD
		MODIGUARD	GUJARATGUARDIANLTD
30	Fireratedglass	CONTRAFLAM/PYROSWISS OF SAINT GOBAIN	SAINTGOBININDIAPVTLTD.
		PROMAT	PROMATFIRE&INSULATION (P)LTD
		PYRANOFSCHOTT	SCHOTTGLASSINDIAPVTLTD.
		PILKINTON	PILKINTONINDIA
31	Anchor / SS Stone Cladding Clamps / Dash Fasteners	HILTI	HILTIINDIAPVTLTD
		FISCHER	FISCHER INDIA
		BOSCH	BOSCHLTD
32	StructuralSteel	SAIL	SAIL
		TISCO	TATASTEEL
		VIZAG	RINL
		JSW	JSW
33	M.SPipeTubes	SAIL	SAIL
		TISCO	TATASTEEL
		VIZAG	RINL
		JINDAL	JSW
34	Stainlesssteel	SALEM	SAIL
		JINDAL	JSW
		SAIL	SAIL
35	Stainless Steel bolts, washers,nuts	KUNDAN	KUNDANINDUSTRIESLTD
		POOJA	POOJASTEELCORPORATION
		ATUL	ATULFASTNERSLTD
		HILTI	HILTIINDIAPVTLTD
36	Stainlesssteel pressure plate	KUNDAN	KUNDANINDUSTRIESLTD
		POOJA	POOJASTEELCORPORATION
		ATUL	ATULFASTNERSLTD

	screws		

37	WeldingRods	ADVANI	ADVANIOERLIKONLTD
		ESAB	ESABINDIAPVTLTD.
38	MetalDeck Sheet	TATA	TATASTEEL
		SAIL	SAIL
39	VitrifiedTiles	NITCO	NITCOLTD.
		RAK	RAKCERAMICINDIAPVTLTD
		RESTILE	RESTILECERAMICLTD
		KAJARIA	KAJARIACERAMICLTD
		JHONSON	PRISMJOHNSONLTD
40	GlazedCeramicTiles (also wall tiles)	NITCO	NITCOLTD.
		RAK	RAKCERAMICINDIAPVTLTD
		KAJARIA	KAJARIACERAMICLTD
		JHONSON	PRISMJOHNSONLTD
41	FloorSpring(Fornon DSR Items)	DORMA	DORMAKABAINDIAPVTLTD.
		INGERSOLRAND	INGERSOLRANDINDIAPVTLTD.
		OZONE	OZONEHARDWARE
		GEZE	GEZEGMBH
42	ThermalInsulation Treatment	PIDILITE	PIDILITEINDUSTRIES
		ELASTOSPRAY	BASF
		ROCKINDIAPVTLTD.	ROCKINDIAPVTLTD
		WEATHERKOOL&SEAL	BERGERPAINTS
43	AcousticInsulation	TWINGERINSUL	U.P.TWIGAFIBERGLASSLTD.
		LLOYDINSULATION	LLOYDINSULATION(INDIA) LTD.
		SAINTGOBAINGYPROC	SAINTGOBINGYPROCINDIA
		HIMALAYANACOUSTICS	HIMALAYANACOUSTICS
		KNAUF	KNAUFGYPSUMINDIAPVT.LTD
		ANUTONE	ANUTONEACOUSTICSLTD.
44	UPVC Pipes and Fittings (RainWater Pipes)	SUPREME	SUPREMEINDUSTRIESLTD
		PRINCE	PRINCEPIPESANDFITTINGS LTD
		FINOLEX	FINOLEXINDUSTRIESLTD
		ASTRAL	ASTRALPOLYTECHNIKLTD
		ASHIRWAD	ASHIRWADPVCPIPES
45	PolycarbonateSheet	MGPOLYPLAST	MGPOLYPAS
		GELEXON	GESILICONS
		DANPALON	DANAPALLIGHTARCHITECTURE
		ALCOX	HINDEGGANALCOXLTD.
		POLYGAL	POLYGALINDIAPVTLTD.

46	FalseCeilings	AEROLITE	ANDHRAPOLYMERSPVTLTD./ AEROLITE INDUSTRIES PVT LTD.
		ANUTONE	ANUTONEACOUSTICSLTD.
		ARMSTRONG	ARMSTRONG WORLD INDUSTRIES
		GRIDSQUARE	GRIDSQUARECEILINGS
		KNAUF	KNAUFGYPSUMINDIAPVT.LTD
		USGBORAL	USGBORAL
		HUNTERDOUGALS	HUNTERDOUGALS
		SAINTGOIBAINGYPROC	SAINTGOBINGYPROCINDIA
47	FalseCeilingMembers (perimeter, Ceiling Section,Intermediates, angles etc.)	ARMSTRONG	ARMSTRONG WORLD INDUSTRIES
		AEROLITE	ANDHRAPOLYMERSPVTLTD./ AEROLITE INDUSTRIES PVT LTD.
		GRIDSQUARE	GRIDSQUARECEILINGS
		GYPFRAMESTEEL	BRITISHGYPSUM
		KNAUF	KNAUFGYPSUMINDIAPVT.LTD
		LLOYD	LLOYDINSULATION(INDIA) LTD.
		SAINTGOBAIN	SAINTGOBAINGYPROC
48	SyntheticEnamelPaint	PREMIUMGLOSSENAMEL	ASIANPAINTLTD
		DULEX	ICIDULEXLTD
		NEROLAC	NEROLACPAINTSLTD
		BERGER	BERGERPAINTS
		NIPPON	NIPPONPAINTINDIALTD.
49	PinkPrimer	WOODPRIMER	ASIANPAINT
		DULEX	ICIDULEX
		NEROLAC	NEROLACKANSIANEROLAC PAINTS LTD
		BERGER	BERGERPAINTS
		NIPPON	NIPPON
50	Red Oxide Zinc ChromatePrimer	HIGHPERFORMANCEYELLOW	ASIANPAINT
		DULEX	ICIDULEX
		NEROLAC	NEROLAC
		BERGER	BERGERPAINTS
		NIPPON	NIPPON
51	AcrylicEmulsion	PREMIUMEMULSION	ASIANPAINT
		DULUX(SUPERCOVER)	ICIDULUX
		NEROLOC(BEAUTYGOLD)	NEROLAC
		BERGER(BISM)	BERGERPAINTS

52	Acrylic Smooth Exterior paint	DULUX	ICIDULUX
		APEX	ASIANPAINTS
		NEROLAC	NEROLAC
		BERGER	BERGER
		NIPPON	NIPPON
53	Premium Acrylic smoothexteriorpaint with silicon additives	ULTIMA	ASIANPAINT
		DULUX	ICIDULUX
		NEROLAC	NEROLAC
		BERGER	BERGER
		SURFEXRAINSHIELD	SURFACOATS
54	CementBasedWall Putty	J.K.WALL PUTTY	J.K.CEMENTSLTD.
		BIRLAWALLCARE	BIRLACEMENTSLTD.
		ASIANPAINTS	ASIANPAINTSLTD.
		BERGER	BERGER
55	AcrylicTexturedPlaster	APEXDURACAST	ASIANPAINTS
		SPECTRUMPAINTS	SPECTRUMPAINTSLTD.
		HERITAGE	HERITAGERAJKAMALGROUP
		ASIANPAINTS	ASIANPAINTS
		NEROLAC	NEROLAC
56	ReadyMixCement Plaster	READIPLAST	ULTRATECHCEMENTSLTD
		GYPROCPLASTERS	SAINTGOBAINGYPROCINDIA
		ULTRATECH	ULTRATECHCEMENTLTD.
		FERROUSCRETE	FERROUSCRETE(INDIA) PVT.LTD
57	MelaminePolish	ASIANPAINTS	ASIANPAINTS
		MELAMINEGOLDWUDFIN	PIDILITEINDUSTRIES
		POLYCURE	POLYCUREMALAYSIA
58	FireRetardantPaint	JOTUN	JOTUNPAINTS
		HILTI	HILTIINDIA
		AKZONOBEL	DULEXAKZONOBELPAINTS
		ASIANPAINTS	ASIANPAINTS
		STPLLTD	STPLLTD
59	Anticorrosive bitumastic paint	BERGER	BERGERPAINTSINDIALTD.
		SHALIMAR	SHALIMARPAINTSINDIALTD.
		IS158BITUMINOUSBLACK	ASIANPAINTS
60	CementPrimer	ASIANPAINTS	ASIANPAINTS
		JK PRIMAXX	JKCEMENTLTD
		BERGER	BERGERPAINTSINDIALTD.
61	Epoxy Paint	ASIANEPOXY	ASIANPAINTS
		BERGER	BERGERPAINTSINDIALTD.
		SHALIMAR	SHALIMARPAINTS
		STPLLTD	SHALIMARTARPRODUCTS
		ARDEXENDURA	ARDEXENDURAINDIAPVTLTD.

		MAPECOATL24	MAPEI CONSTRUCTION PRODUCTS INDIA P LTD.
		NEROLAC	NEROLAC
		SUNEPOXYPAINT	SUNANDA SPECIALITY
62	EpoxyCoating	BASF	BASFINDIALTD.
		FOSROC	FOSROCLTD
		SIKA	SIKAINDIAPVTLTD.
63	Interlocking concrete paver blocks	ULTRA	ULTRATILESPRIVATELTD
		HINDUSTANTILES	HINDUSTANTILES,RANCHI, PUNE
		NITCO(ROCKARD)	NITCO
		BASANTBETONS	BASANTBETONS
64	Solar Studs / Median markers	3M	3MSCIENCE
		AVERYDENNISON	AVERYDENNISONINDIAPVT. LTD.
		NIKKALITE	NIPPONCARBIDEINDUSTRIES (USA)
65	Mirror	MODIGUARD	GUJARATGUARDIANLTD
		SAINTGOBAIN	SAINTGOBAINGLASSINDIA LTD.
		AISMIRROR	ASAHIINDIAGLASSLTD
		ATUL	ATULGLASSINDUSTRIESLTD.
66	VitreousCommodes / Washbasin	HINDWARE	HSILLTD
		ROCA	ROCABATHROOMPRODUCTS
		PARRYWARE	ROCABATHPVTLTD.
		KOHLER	KOHIERWORLDWIDE
		JAQUAR	JAQUARGROUP
67	FlushingCistern	PARRYWARE	ROCABATHPVTLTD.
		KOHLER	KOHLERWORLDWIDE
		HINDWARE	HSILLTD
		JAQUAR	JAQUARGROUP
68	SWRPVCPipesand Fittings	SUPREME	SUPREMEINDUSTRIESLTD
		ASTRAL	ASTRALPOLYTECHNIKLTD
		FINOLEX	FINOLEXINDUSTRIESLTD
		FLOWGUARD	ASHIRWADPVCPIPES
		PRINCE	PRINCEPIPESANDFITTINGS LTD
69	StainlessSteelKitchen Sink	JHONSON	PRISONJHONSONLTD.
		JINDAL	CENTUARYPOLYTECH
		NILKANTH	NILKANT

		NIRALI	JYOTI (INDIA) METAL INDUSTRIES PVT LTD.
		HINDWARE	HSILLTD.

70	Centrifugally Caste (Spun)IronSoilPipes	NECO	JAYASWALNECOLTD.
		HEPCO	HEPCO
		NECO	JAYASWALNECOLTD.
		RPMF	RAJPATTERNMAKERSAND FOUNDERS PVT LTD.
		HIF	M/S.BABULALBAJAJIRON FOUNDRY
		BIC	BENGALIRONCORPORATION
71	GIPipes	TATA	TATASTEEL LTD.
		ZENITH	ZENITHBIRLA(INDIA)LTD.
		HISSAR	HISSAR
		JINDAL	JINDALPIPESLTD.
		APOLLO	APLAPOLLO
72	GIPipesFittings	ZOLOTO	ZOLOTOINDUSTRIES
		UNIK	UNIKMALLEABLES
		HB	HBINDUSTRIES
		ICS	SGREESAMARTHENGINEERS
73	WaterSupplyValves	ZOLOTO	ZOLOTOINDUSTRIES
		LEADER	LEADERVALVESLTD.
		ARCO	ARCOVALVESPVTLTD
		NANDA	NANDAMILLERCOMPANY
74	CPVC Pipes and Fittings	SUPREME	SUPREMEINDUSTRIESLTD
		FINOLEX	FINOLEXINDUSTRIESLTD
		ASTRAL	ASTRALPOLYTECHNIKLTD
		PRINCE	PRINCEPIPESANDFITTINGS LTD
		BIRLAAEROCON	HILLTD
		ASHIRWAD	ASHIRWADPVCPIPES
75	DIPipes	ELECTROSTEEL	ELECTROSTEEL
		JINDAL	JINDAL
		TATADUCTURA	TATADUCTURA
		KAPILANSH	KAPILANSH
76	DIfittings	ELECTROSTEEL	ELECTROSTEEL
		JINDAL	JINDAL
		TATADUCTURA	TATADUCTURA
		KAPILANSH	KAPILANSH
77	Water supply fixtureslikebibcock, shower panels	JAQUAR	JAQUARGROUP
		PARRYWARE	ROCABATHROOMPRODUCTSPVT LTD
		MARC	MARKSHOWERS
78	AirReleaseValve	KIRLOSKAR	KIRLOSKARBROTHERSLTD.
		RBM	AFSLTD
		KARTAR	KARTARVALVESPRIVATELTD.

79	CentrifugallyCaste (Spun) Iron	LANCO/SRIPIPES	ELECTROSTEELCASTINGSLTD.
		JINDAL	JINDALSAWLTD
		KESHORAM	KESORAMINDUSTRIESLTD
		ELECTROSTEEL	ELECTROSTEELCASTINGSLTD.
80	SpunCastIronFittings	NECO	JAYASWALNECOLTD.
		KARTAR	KARTARVALVESPRIVATELTD.
		ELECTROSTEEL	ELECTROSTEELCASTINGSLTD.
		KAPILANSHCENTRIFUGAL	KAPILANSHDHATUUDYOG(P) LTD.
		SKFBRAND	SINGHALIRONFOUNDARYPVT LTD
81	CI double flange sluice valve	KIRLOSKAR	KIRLOSKARBROTHERSLTD.
		RBM	AFSLTD
		KARTAR	KARTARVALVESPRIVATELTD.
		IVS	INDIANVALVESPRIVATELTD.
		ZOLOTO	ZOLOTOINDUSTRIES
		BURN	BURN
		LEADER	LEADERVALVESLTD.
82	CI double flanged non return valve	Kirloskar	KirloskarBrothersLtd.,
		Fluidtech	Fluidtech
		Zolto	ZolotaIndustries
83	GunmetalValves	Zolto	ZolotaIndustries
		Leader	LeadervalvesLtd.
		Sant	SantvalvesPvtLtd,
		Audco	L&TValves
84	RCCPipes	IndianHume Pipe	IndianHumePipeLtd.,
		Maduraispunpipe	Maduraispunpipe company
		LakshmiSood&Sood	LakshmiSood&SoodPipeCo.
		Jain& Co	JainspunpipesCo.,
85	CIManholecover	Neco	JayaswalNeco Ltd.,
		HEPCO	BinayUdyogPvt.Ltd.
		BIC	Bengaliron corporation
86	SFRC Cover and grating	KK	KKManholeandgratingsCo Pvt Ltd.,
		Advent	Adventconcretevision
		Kutty	KuttyIndustries
		Nu-TEC	Nu-Techconcreteproducts (P)Ltd,.
		DEC	DECI&PIndiaPvt.Ltd.
87	PlasticEncapsulated Foot Rest	KKIndia	KKManholeandgratingsCo Pvt Ltd.,
		KGM	KGMExports.
		AccurateBuildcon	AccurateBuildconcompany.

88	Spuncastironcovers &gratings	Neco	JayaswalNecoLtd
		Jagannath	SriJagannathIronFoundry Pvt. Ltd.
		KapilanshCentrifugal	KapilanshDhatu Udyog(P)Ltd.
		SKFbrand	SINGHALIRONFOUNDARY Pvt.Ltd.,
89	Aluminium doors/windows sections	Hindalco	HindalcoIndustriesLtd.,
		Jindal	JindalAluminiumLtd.,
		Indal	IndianAluminiumLtd.,
90	Aluminiumsystems/Anodisedaluminium fittings for doors/windows	Define	DefineOverseasPvt.Ltd.
		Schueco	SchuecoIndiaPvt.Ltd.,
		Bhoruka	BhorukaAluminiumLtd.,
		Kawneer	KawneerIndia
		Hardima	Hardimasalescorporation
		Everite	EveriteAgencies
		Jyothi	JyothiIndustries
		Sigma	Sigma Corporation
91	Frictionstayhinges	KINLONG	KinlongIndustries
		HETTICH	HettichIndiaPvtLtd.
		DORMA	DormakabaIndiaPvt.Ltd
92	EPDMGaskets	Anand	AnandNVHproducts(P)Ltd.,
		Roop	RoopPolymersLtd.,
		Bohra	BohrarubberPvtLtd.,
		Hanu	Hanu Industries
		AmeeRubber	AmeeRubberIndustriesPvt Ltd.
93	SiliconGaskets	SreeGaurav	SreeGauravRubber products
		DOWCORNING	DOWCORNINGSEALANTS
		G.E	GESealants
		WACKER	WACKERSEALANTS
94	MaskingTapes	3M	3M
		Sun	Sun
		Wonderpolymer	WonderTapeIndustries
		Roop	RoopPolymersLtd.,

95	Waterproofing compound	Fosroc	FosrocIndia
		Sika	SikaIndia
		BASF	BASFIndiaLtd.,
		BASF	BASFIndiaLtd.,
		FerrousCrete	FerrousCrete(India)Pvt.Ltd.
		STPLtd	ShalimarTarProducts

96	MembraneWater proofing system	Asianpaints	SmartCareWaterProofing products
		Dr.Fixit	PidiliteIndustries
		Sika	SikaIndia
97	Chemical waterproofi ng system	BASF	BASFIndiaLtd.,
		FerrousCrete	FerrousCrete(India)Pvt.Ltd.
		Sika	SikaIndia
		Dr.Fixit	PidiliteIndustries
98	Waterstops	Hydrotite	Sika India
		BASF	BASFIndiaLtd.,
		Dr.Fixit	PidiliteIndustries
		Hydroswell	SikaIndia
99	Alumini um composi te panels	Alucobond	3ACompositesIndiaPvt.Ltd.
		Eurobond	M/SEuropanelproductsP vt. Ltd.
		Aludecor	M/SAludecorLaminati on Pvt. Ltd.
		Reynobond	Reynobond
		Alpolic	Alpolic
		Alstrong	Alstrong
100	PVCPerforatedPipes	RexPolyextrusion	RexPolyextrusionLtd,
		AkashEnterprises	AkashEnterprises
		ZenplasPipes	ZenplasPipesPvt.Ltd.,
		Supreme	SupremeIndustries
101	PlayEquipments	KoochiePlay	KoochiePlaySystemsP vt. Ltd
		PlayworldSystems	PlayworldSystemsIndia
102	StructuralSealant	Dow corning	DowcorningIndia
		Wacker	WackerSilicones.
		GE	GESilicones
		STPLtd.	ShalimarTarProducts
		Asianpaints	SmartCareSealant
		Fosroc	FosrocIndia
		BASF	BASFIndiaLtd.,
103	Poly-sulphidesealant	Dr.Fixit	PidiliteIndustries Ltd,
		FerrousCrete	FerrousCrete(India)Pvt.Ltd.
		MYKSchomburg	MYKArmentsrangeof products
		Pidilite	PidiliteIndusteries
		STPLtd.	ShalimarTarProducts
		Fosroc	FosrocIndia
		Techseal	ChokseyChemicalPvt.Ltd,
		SmartCare	AsianPaints
		Fosroc	FosrocIndia
		FerrousCrete	FerrousCrete(India)Pvt.Ltd.

104	Epoxy	Shalibons	ShalimarTarProducts
		Asianpaints	AsianPaints
		Ardex	ArdexEndura(India)Pvt.Ltd,.
105	GRCJali	Terrafirma	TerrafirmaGRCIndustries
		Ecovision	EcovisionIndustriesPvt.Ltd.,
		MaheshGRC	MaheshPrefabPvtLtd.,
106	Readymade/Gypsum Plaster	FerrousCrete	FerrousCrete(India)Pvt.Ltd.
		GyprocCute100	GyprocIndia
		Ultratech	UltratechcementsLtd.
107	SteelWindows/Pressed Steel Frames	MadhuIndustries,	MadhuIndustries,San Harvic, NCL
		SanHarvic	SanHarvic
		NCL	NCLIndustries
108	PVCFlooring	LGHausys	LGHausys
		Gerflor	Gerflorflooring
		Armstrong	ArmstrongWorldIndustries
109	GrassPaver	Unistone,	Unistone
		Ultra	Ultra Ltd.
		NITCO	NITCOLtd.
		BesantBetons	BesantBetons
		HindustanTiles	HindustanTiles
110	FRP DoorFrames & Shutter	MeenaFibreGlass	MeenaFibreGlass
		Duroplast	DuroplastextrusionPvtLtd
		Cactus	Cactus
		Polyline.	Polyline
111	Non Metallic Floor SurfaceHardeners	Ironite	Ironite
		Hardonite	Hardonite
		FOSROC	FosrocIndia
		SIKA	SIKaIndia
		BASF	BASFIndiaLtd.,
		CICO	CICOTechnologiesLtd.,
		Pidilite	PidiliteIndustries Ltd,

112	PU Enamel Metallic PaintsonMSStructure & Epoxypaints(Premium Quality)	SKK	SKKLtd.
		Akzonobel	Akzonobel
		Asian	AsianPaints
		Berger,	BergerpaintsIndiaLtd.
		MRF	MRFPaints
113	Rockwool/Glaswool insulation	Twigafiber	Twigaifiberglassltd
		LlyodInsulation	LlyodInsulationLtd.
		Supereme	SuperemeIndustriesltd
114	Atactic Polypropylene (APP) Modified Water proof Membrane	STP	ShalimarTarProducts
		FerrousCrete	FerrousCrete(India)Pvt.Ltd.
		BitumatCo.Ltd,	BitumatCo.Ltd,
		Pidilite	PidiliteIndustries Ltd,
		ArdexEndura	ArdexEndura
		HydrotechLtd.	HydrotechLtd
		SmartCare	AsianPaints
		Proshield	BergerPaints
		IWLIndiaLimited	IWLIndiaLimited
115	StructuralGlazing	Modi,	ModiGuard
		SaintGobain	SaintGobainGlassIndiaLtd.,
		Asahi,	AsahiIndiaglassLtd,
		Glaverbel	GlaverbelIndia
116	Sensor Based Auto flush Systems	TOTO	TOTOLtd
		Parryware	Parryware
		Hindware	HSILLtd
		Jaquar	JaquarGroup
		Kochier	Kochier
117	FloatValve(BallValve)	Prayag	PrayagPolymers(P)Ltd
		Leader	LeadervalvesLtd.
		Zoloto	ZolotaIndustries
		IBP	IBPIndustries
		Arco	ArcovalvesPvt.Ltd.,
118	SpiderPatchFittings for Structural Glazing	Dorma	DormakabaIndiaPvt.Ltd
		Sevax	SaintGobainGlassIndiaLtd.,
		Ozone	OzoneLtd
		Hafele	HafeleLtd
119	AdhesiveforAAC Block/Tiles	Ultrtech	UltratechcementsLtd.
		ArdexEndura/GoldStar	ArdexEndura
		FerrousCrete	FerrousCrete(India)Pvt.Ltd.
		SmartCareTileAdhesive	AsianPaints
		TileAdhesivePlus	BergerPaints
120	AluminiumFormwork	MFE(MIVAN)	MIVAN
		S-Form	S-Form
		MFS	MFS

		Maini	Maini
		OrequivalentasapprovedbyEngineerinCharge	
121	EPDMWaterProofing Membrane	SmartCare	AsianPaints
		FerrousCrete	FerrousCrete(India)Pvt.Ltd.
		Pidilite	PidiliteIndustries
		STP	ShalimarTarProducts
		Fosroc	FosrocIndia
122	PU Coating (UVResistant LiquidApplied Coating)	BASF	BASF
		Fosroc	FosrocIndia
		SIKA	SIKAIndia
123	ModularKitchen /Wardrobes/Hardware and Accessories	Sleek	AsianPaints
		Godrej	Godrej&BoyceCo.
		Evoke	Evoke
		JhonsenKitchen	H&RJohnsonIndiaLimited
124	HighendExterior Textures	Allura/GranizaRange	AsianPaints
		SKKBrand	SKKLtd.
		Berger	BergerpaintsIndiaLtd.
125	AcrylicExterior Textures	Asianpaints	AsianPaints
		Berger	BergerpaintsIndiaLtd.
		Nerolac	NerolacPaintsLtd
126	GPGrout	FerrousCrete	FerrousCrete(India)Pvt.Ltd.
		Asianpaints	SmartCareSCGPGroutGrey
		BASF	BASF
		Pidilite	PidiliteIndustries Ltd.
		SIKA	SIKAIndia
127	Galvolume sheetfor roofing, cladding,Sandwich panel	LlyodMetalCraft	LlyodInsulations.
		TataBlueScope	TataBluescope
		Bhushan	Bhushansteel
		JSW	JSW
		Essar	Essargroup
128.	SS 304/ 316 water supply pipes	Rampart	RampartIndiaPvtLtd
		JPRESS	JPRESS
		JINDAL	JINDAL
129.	Workstations,Storage,	Godrej	M/sGodrej&BoyceMfg.Co.
		FeatherLite	FeatherLite
		Wipro	WIPROFurnitures
130.	Compactors	Godrej	M/sGodrej&BoyceMfg.Co.Pvt.
		WIPRO	WIPROFurnitures
		Kompress	KompressIndiaPvt.Ltd
131.	Safety Film for Glass	3M	3M
		Dupont	Dupont

		LG	LG
		Garware	Garware
132.	EngineeredWoodFloor	ARMSTRONG	ARMSTRONGFLOORING
		MIKASAREALWOODFLOORS	GREENLAMINDUSTRIES
		NEWWOOD	NEWWOODINDIALTD
		WERNER	WERNERFLOORS
		PERGO	REDFLOORINDIA
133	ModularToiletCubical	Greenlam	GREENLAMINDUSTRIESLTD
		Merino	MERINOLAMINATES
		Stylam	STYLAMINDUSTRIESLTD

S.No	ITEM	APPROVED MAKE
	ELECTRICAL WORK	
1	LT Switchboards other than TTA panel	Any CPRI Tested Panel Manufacturer With 7 Tank Process
2	Main LT panel as per IEC 61439 (TTA/ DESIGN VERIFIED PANELS)	L&T/Siemens/Schneider/ABB
3	Sandwich bus duct	Schenider / Siemens / C&S / Legrand
4	PLC & SCADA	Siemens / Schneider / Rock well Automation/Honeywell
5	Energy Billing software	Schneider / Legrand/Honeywell
6	ACB	ABB T- MAX / SIEMENS -3 WL / SCHNEIDER ELECTRIC MASTERPACT NW/ LEGRAND DMX3/L&T(U-Power)
7	MCCB	ABB (T-MAX) / SIEMENS (VL) / SCHNEIDER COMPACT NSX / LEGRAND (DX3) /L&T (D-Sine)
8	MPCB	ABB (T-MAX) / SIEMENS (VL) / SCHNEIDER COMPACT NSX / LEGRAND (DX3) /L&T (D-Sine)
9	Contactor (Type-2 coordinated)	Schneider / ABB / Siemens / Legrand / L&T
10	MCB/RCCB, RCBO,	Schneider / ABB / Siemens / Legrand / Hager

	SPD/Distribution board	
11	Auto transfer switches with over ing neutral (7000, 300 & 230 Series)	SCHNEIDER / ABB/ Legrand / Hager
12	On-load changeover switches	Socomec / ABB / Siemens/HPL
13	Transient voltage surge suppressors	SCHNEIDER / ZOTUP/OBO/Legrand
14	Indicating meters - Digital	Conserv / Secure/L&T/AE/ EL-MEASURE
15	Indicating meters - Analog	Conserv / Secure/L&T/AE/ EL-MEASURE
16	Power Monitor with RS-485 Port	Schneider / Circutor / Secure
17	Digital Load Monitor with RS-485 Port	Schneider / Circutor / Secure
18	KWH Meters - ETVM	L & T / Secure/Conserve/HPL
19	Dual KWH Meters with RS-485	Schneider / Circutor
20	Current transformer	BCH /C&S/AE/ Kappa
21	Potential transformer	BCH /C&S/AE/ Kappa
22	APFC relay/ Numeric Type Protection Relays	Epcos / Schneider / Neptune/Siemens/ L&T/ ABB GE
23	Capacitor Banks	Epcos / Schneider / Neptune
24	Series reactors (tuned filters), Capacitor duty contactors/ Thyristor Switching Module	Epcos / Schneider / Neptune
25	Push button stations/	Schneider / Siemens / L&T/ABB/Legrand
26	Selector switches	Salzer / Kaycee / BCH
27	LED Indicating lamp	Siemens / Schneider/ ESBEE/Vaishno
28	Terminals	Wago / Phenonix / Connect well/Elemex
29	LT/HT Cables	Poly Cab / KEI /Havells/Finolex
30	FRLS/FS/ZHFR PVC Insulated PVC sheathed multistrand copper conductorcables (Single & multi core)	Polycab / Finolex / KEI/ Havells /RR Kabel
31	Glands & Lugs	COMMET / GRIPWEL / DOWELL / RAYCHEM/ BRACO

32	HT Panels	Schneider/ Siemens/ ABB/C&S
33	Dry Type Cast Resin Distribution Transformer	KIRLOSKAR / VOLTAMP / HITACHI / RAYCHEM
34	11/0.415 kV Compact Substation (CSS)with Dry type Transformer	Schneider/Siemens/ABB
35	Bus bar	Hindalco
36	OLTC/RTCC	OLGR/ESAUN/CTR
37	Outdoor Enclosures	Hensel / Schneider /Neptune/ Mennekes
38	Lighting Inverters (Hybrid with Solar Type)	Emerson / Delta / Tmec / Microteck /As Per Oem/ Zenner
39	Modular Switch & Socket, Industrial Socket, Fan Regulator, Metal Boxes, RJ 11, Standalone RJ 45, TV Outlet, Etc	Northwest (Artisa)/ Anchor Panasonic (Vision)/ Crabtree (Murano)/ Legrand (Arteor) / Schneider (Zen Celo)
40	Occupancy Sensors	Lutron / Crestron / Leviton / Honeywell / Philips
41	Industrial Type Socket with Plug Top	Mennekes / Hensel / Schneider / Neptune
42	Cable Trays	Profab / Obo / Legrand /Indiana/Ricoh
43	Floor / Ceiling Wire Ways	Profab / Obo / Legrand /Indiana/Ricoh
44	PVC Conduits - Frls	VIP / Precision / Polycab/AKG/BEC
45	Conduits - Ms	Gb/BEC/AKG/Rm-CON
46	Lightning Arrester	Obo / Jeff / Cape/Erico/L&T
47	Plate and Pipe Electrodes	Class B – Tata /Jindal./SAIL
48	Pipe – Galvanized for Plate & Pipe Electrodes	Class B – Tata /Jindal./SAIL
49	Maintenance Free Electrode	Erico / Obo / Jeff / Cape
50	Network switches	CISCO/ JUNIPER / EXTREME / HPE (ARUBA)
51	Monitor	Bosch/Honeywell/Pelco/Siemens
52	Computer	HP/Dell/IBM
53	Earth Strips	Hot Dip Galvanised
54	Earth Bus with Insulators	Electrolytic Grade Copper / Aluminium / Hot Dip Galvanised

55	OFC Cable, LIU, Jack Panel, Patch Panel, Patch Cord, Face Plate, Cat – 6A Cable, Cat6A I/O, Cable Manager	SIEMON/ SCHNEIDER/ MOLEX/ LEGRAND/BELDEN/ COMMSCOPE
56	Cat – 6A Cable, Cat6A I/O, Cable Manager	SIEMON/ SCHNEIDER/ MOLEX/ LEGRAND/BELDEN/ COMMSCOPE
57	Ceiling/exhaust Fan	Cromtron/Almonard/ Havells / Polycab / Atomberg
58	Luminaries	Philips/Trilux/Havells/Crompton/ Lighting Technology/
59	Active Harmonic Filter	Schneider / Abb / Neptune / Epcos / Circutor
60	Explosion Proof Sockets	Baliga / Abb/ Legrand / Stall
61	Lighting poles	Bajaj /Philips/K-lite/Wipro/Twinkle
62	Aviation obstruction light	Bajaj/Binay/Actos
63	Lighting control	Lutron/Philips/Crestron
64	DWC Pipe (Double wall corrugated pipe)	Ashirwad/Supreme/Astral/Duraline/Nocil
65	Diesel Genset/Engine	Caterpillar / Cummins India / Perkins / Mitsubishi/Kirloskar
66	Alternator	Leroy Somer / Stamford/Kirloskar
67	Synchronizing panel / AMF panel,Auxiliary Panel and Motor Control Centre	Any CPRI Tested Panel Manufacturer With 7 Tank Process
68	PLC & SCADA	Allen Bradley / Larsen & Toubro / Modicon (Schneider Electric) / Siemens
69	Cooling Towers	Paharpur/Bell
70	Power Monitor with RS-485 Port	Schneider / Siemens / ABB / Circutor
71	Digital Load Monitor with RS-485 Port	Schneider / Siemens / ABB / Circutor
72	Terminals	Wago / Phenonix / Connect well
73	HRC fusses for PT protection	Alstom / L&T / Pentagon / Cooper Busman
74	Terminaiton kits	3M/Raychem/M Seal
75	Glands & Lugs/Bimetalic lugs	HMI / Dowells / SMI/Comet
76	Fire Sealant & Fire-Retardant Paint	Jotun/HILTI /Asian/STPL
77	M.S. Pipe upto 200 MM Dia.	Jindal / Tata Steel / SAIL

78	MS PIPES above 200 mm dia factory rolled	TATA / JINDAL / SAIL
79	Pot Strainer	Emerald / Sant
80	Vibration Isolators	Cori / Dunlop / Kanwal Industries Corporation / Flexionics / Resistoflex / GERB
81	Noise Control Silencer / Muffler (Residential Type Silencer)	Intertec / Sound Control India
82	HSD Fuel Transfer Pumps	Rotodel / Kirloskar/Grundfos
83	Insulation / Fiberglass	Polyond / Rockwool india
84	Pressure Gauge	Emrald / Fiebig /H Guru.
85	Thermometer	Emerald / H Guru / Taylor
86	Alarm Annunciator	Advani Oralikon / Larsen & Toubro / Minilec
87	Pumps	MATHER&PLATT/ FRANKLIN/ KSB/ GRUNDFOS/ XYLEM/ ARMSTRONG/ KIRLOSKAR
88	Motors	Siemens / ABB / Kirloskar/Crompton
89	Plug Valve	AUDCO/ ADVANCE/ TYCO/ ZOLOTO/ VICTAULIC/ KIRLOSKAR
90	Butterfly valves	AUDCO/ ADVANCE/ TYCO/ ZOLOTO/ VICTAULIC/ KIRLOSKAR
91	Gate / NRV / Check valves	Danfoss / Honeywell / Johnsons Control / Belimo/ Flowcon/Zoloto
92	Flexible Pipe Connections	Flexionics / Resistoflex
93	Pypcoat (AW4) for fuel tank &Burried oil piping	IWL
94	Temperature sensors, pressure gauge, flow switch, pressure switch, differential pressure switch, actuators, room thermostat, humidity sensor, flow meter, hardness analyzer, ph, chlorine, tds, co, co2 sensors etc.	Honeywell/ Schneider Electric/ Siemens / Johnson Control / Danfoss/ Trane/ H-Guru / Belimo
95	Level Indicator (Oil)	Forbes Marshall

96	Anchor Fastner	Fisher / Hilti/ Mungo
97	GI Pipe Fittings	Unik / Zoloto M/TATA
98	Welding Rod	ADOR / Advani / Cosmos / Esab
99	Battery Charger & Batteries	Exide / Hitachi / Panasonic /Amar Raja / Amaron
100	Insulating Mats (as per local state electricity board) Portable Fire Extinguishers	Commercial Enterprises / DL Miller & Co. Ltd. /Premier Polyfilm Ltd./ RMG Polyvinyl India Ltd Steelage / Minimax / Vijay fire / TYCO

101	UPS systems	Schneider / Socomec / Delta / Emerson / Tmeic/Eaton
102	Battery	Exide / Hitachi / Panasonic /Amar Raja / Amaron
103	K13 Isolation transformer	MGM / Datson / Elmas
104	**SECURITY SYSTEMS** IP Camera (Multi Sensor, Dome, Multii)	SONY/BOSCH/ AXIS / PELCO/HONEYWELL
105	Sensor & Bullet Camera	SONY/BOSCH/ AXIS / PELCO/HONEYWELL
106	Video Management Software	Honeywell / Qognify/ Genetec / Camera Oem
107	Network Video Recorder	Honeywell / Ibm, Dell, Hp, Camera Oem
108	Central Management Server	Ibm, Dell, Hp, Camera Oem
109	Housing, Lens	Honeywell / Siemens / Schneider / Bosch / Arecont Vision / Mobotix
110	Joystick	Honeywell / Siemens / Schneider / Bosch / Arecont Vision / Mobotix
111	Industrial Grade Monitor	Sony / Lg / Samsung
112	Client Workstation	Dell / Hp / Compaq / Ibm
113	Networks Switches	Cisco/ Juniper / Extreme / Hpe (Aruba)
114	Network Components(Server	Val Rack / Rittal / Apw / Net Rack / D Link

	Racks,Connectors)	
115	Sc Connectors	Amp / Digilink/Honeywell / Siemens
116	Acs Controller	Honeywell / Siemens / Schneider / Hid
117	Acs Software	Honeywell / Siemens / Schneider / Hid/Onguard / Ccure
118	Panic Bar	Dorma / Trimec / Locknetics
119	Card/ Card Reader	Hid / Indala / Exceed/cardex/GE/Kaba
120	Magnetic Door Lock	Bel / Locknetics / Abloy/Ebelco/Siemens/ Dorma/Dynalock
121	Housing, Power Supply	Honeywell / Bosch / Ge / Lenel
122	Industrial Grade Monitor	Sony / LG / Samsung
123	Door controller & software	American Dynamics/Bosch/Automatic Systems /CardKey GE –Casirusco/Honeywell – Prowatch Series/Kaba Siemens/Tyco
124	Electric Door Strikes	Kaba/Lock netics/Miwa Lock/Rutherford/Trimec
125	Boom Barriers/ Half Height Swing /Retractable /Flap type Barriers (Imported)	Automatic Systems (Belgium)/FAAC (ITALY)/Gunnebo Kaba /Magnetic/Somfy India
126	Door Frame Metal Detectors	Metor/Garett/Godrej
127	Authorized System Integrators for Fire Alarm & CCTV System	Honeywell/UTC/Prudential/L&T/Percept Devices Marketing Sterling & Wilson
128	Solar PV Modules	Approved As Per Prevailing Om /Almm List OfMnre /Approved By Engineer Incharge As Per Tender Specifications
129	Power Conditioning Unit	Fronus/ SMA/ Delta/ Fimer / Emerson/ Growatt/ Goodwe /Solis/ OEM of SPV Module
130	Accessories / Connectors	MC / Tyco solar/HENSELGERMANY / ELTSO /VNT/ TECHSER/ OEM OF SPV MODULES.
131	Data logger / System Performance	ABB / Electro industries / Energy / Recommence / Energy tracking IIC / Schlumberger

132	**PHE WORKS** CPVC pipe	Astral pro, Ashirwad, Supreme, Finolex
133	CPVC fittings	Astral pro, Ashirwad, Supreme, Finolex
134	GI fittings	R' Brand, Unik, HB / NVR
135	GI pipes	TATA/ Jindal/SAIL
136	CI pipes and fittings	Neco/ BIC/SAIL
137	Butterfly valve (50mm to 100mm)	Intervalve, Audco, L &T
138	Kurra CI / SS	Neer, Kessel, Aco
139	Kurra UpVC	Supreme or Approved equivalent
140	Non return valve	Intervalve, Audco, L &T
141	Ball valve (15mm to 40mm)	Lehry, RB, Legris, Conex
142	Air release valve	Zoloto, RB, Lehry, Legries / Conex/Itap
143	Water meter	Dasmesh, Acteris, Krnati, Kaycee
144	Anchor fastner	Hilti, Fischer/Mungo
145	U' Clamps	Hitech supports & hangers pvt ltd, Itech
146	RCC hume pipes	Indian hume pipe, Sudarshan hume pipe, Approved equivalent
147	UPVC pipes (SWR Quality)	Astral pro, Ashirwad, Supreme
148	UPVC pipes (Agriculture series)	Astral pro, Ashirwad, Supreme
149	PVC fittings (Fabricated)	Clarion or approved equivalent
150	PVC fittings (Moulded)	Astral pro, Ashirwad, Supreme
151	PVC floor traps (Moulded)	Astral pro, Ashirwad
152	Manhole cover - Cast iron	BIC, Jayaswal Neco Industries Ltd/Hepco
153	Manhole cover - (RCC Precast)	Rajvaibhav, SFRC, DM precast, Sobha concrete products/Southern concrete
154	Level Controllers	Aqua inteltech, Vinayaka
155	Insulation for GI buried pipes	Pypkote, Tapex, IWL

156	Enamel paint	Asian paints, Apcolite, Berger,
157	Hot water pipe insulation	Vidoflex, Armaflex
158	Air admittance valve	Studor, Din Certo, Essenco
159	Pressure reducing valve	Hawk, TBS, Cimberio, RB / Varie
160	Y' Strainer	RB, TBS, Cimberio, Energy/Sant/Leader
161	UPVC - SCHEDULE 80 Pipe &Pipe fittings	Astral pro, Ashirwad, Supreme
162	HDPE pipe	Astral pro, Supreme or approved equivalent
163	DWC Pipe (Double wall corrugated pipe)	Ashirwad, Supreme/Astral/Duraline
164	Motorised valve	HONEYWELL/ SCHNEIDER ELECTRIC/ SIEMENS / JOHNSON CONTROL / DANFOSS/ TRANE/ H-GURU / BELIMO
165	FRP/GRP covers	Thermodrain
166	Pumps	MATHER&PLATT/ FRANKLIN/ KSB/ GRUNDFOS/ XYLEM/ ARMSTRONG/ KIRLOSKAR
167	Fire protection PUMPS	KIRLOSKAR / MATHER & PLATT (WILO) / GRUNDFOS/ Armstrong
168	G. I PIPES	TATA/ JINDAL (HISSAR)/ SAIL/ VIZAG STEEL Note: Pipe shall be ISI mark.
169	PIPE FITTINGS	MONTEX FORGE / B&M / JAINSONS / SANT
170	ANTICORROSIVE MATERIAL	IWL / RUSTECH
171	FIRE EXTINGUISHERS	CEASEFIRE / KANEX / SUPREMEX / MINIMAX
172	BUTTERFLY VALVE	L&T / SANT / ZOLOTO / INTERVALVE
173	PAINT	ASIAN / BERGER
174	ANCHOR FASTENERS	HILTI / FISCHER / MUPRO
175	SUPPORTS	MUPRO / FISCHER / HI TECH
176	Balancing Valve, Butterfly	AUDCO/ ADVANCE/ TYCO/ ZOLOTO/

	Valve, Sluice Valve, Nrv/Check Valve, Strainer And Other Type Of Valves	VICTAULIC/ KIRLOSKAR
177	FLOW METER	FEDRAL / TELEFLO / EUREKA
178	PRESSURE SWITCH	INDFOS / SWITZER / DANFOS
179	THERMOMETERS/ PRESSURE GAUGE	H. GURU / FIEBIG / GENERAL INSTRUMENTS
180	FIRE BRIGADE CONNECTION, AIR RELEASE VALVE, HYDRANT VALVE, FIRST AID HOSE REEL (DRUM AND BRACKET), FIRE HOSE, BRANCH PIPE, FIREMAN AXE, RRL HOSE, HOSE CABINET	SAFEX/ NEWAGE/ GETECH/ VICTAULIC/ TYCO
181	FIRE SEALANT	HILTI / 3M / STI
182	SPRINKLER ALARM VALVE	MONSHER (SHARP) / NEWAGE PLUS / RAPIDROP / VIKING
183	SPRINKLER	TYCO / HD / NEWAGE/ EVERSAFE/ GETECH/ VIKING /SAFEX
184	FLOW SWITCH	HONEYWELL / SYSTEM SENSOR / POTTER
185	FLEXIBLE DROP	RESISTOFLEX / DUNLOP / EASYFLEX/NEWAGE/SAFEX
186	ROSETTE PLATES	VIKING / RAPIDROP / EQUIVALENT
187	EXPANSION BELLOWS	EASYFLEX / RESISTOFLEX / CORI
188	HUME PIPES	INDIAN HUME PIPES / EQUIVALENT
189	DIESEL ENGINE	KOEL / CUMMINS / GREAVES / ASHOK LEYLAND
190	PHOTOLUMINESCENT SIGNAGES	PROLITE / AUTOLITE
191	BATTERY OPERATED SIGNAGE'S	TEKNOWARE / PROLITE / EATON
192	FIRE ALARM AND EMERGENCY VOICE EVACUATION PANEL	Honeywell/Tyco/EST / SECUTRON (MIRCOM) / SIEMENS / ATEIS
193	DETECTION DEVICES	Honeywell/Tyco/EST / SECUTRON (MIRCOM)

		/ SIEMENS / ATEIS
194	ANNUNCIATION DEVICES	Honeywell/Tyco/EST / SECUTRON (MIRCOM) / SIEMENS / ATEIS
195	MODULES	Honeywell/Tyco/EST / SECUTRON (MIRCOM) / SIEMENS / ATEIS
196	CONTROL / POWER CABLES	POLYCAB / BONTON / VARSHA
197	SPEAKERS	EST / SECUTRON (MIRCOM) / SIEMENS
198	DIGITSL VOICE COMMAND	EST / SECUTRON (MIRCOM) / SIEMENS
199	AMPLIFIERS & ACCESSORIES	EST / SECUTRON (MIRCOM) / SIEMENS
200	FIRE CURTAIN	ORIENT FIRE / KENT / PACIFIC FIRE CONTROLS
201	NOVEC 1230 AGENT	KIDDE (UTC) / ANSUL / CRYPTZO
202	SEAMLESS CYLINDERS	RAMA / EKC
203	SEAMLESS PIPES	TATA/ JINDAL (HISSAR)/ SAIL/ VIZAG STEEL Note: Pipe shall be ISI mark.
204	DISCHARGE NOZZLES	KIDDE (UTC) / ANSUL / CRYPTZO
205	DISCHARGE / ACTUATION HOSE	KIDDE (UTC) / ANSUL / CRYPTZO
206	ELECTRIC ACTUATOR	KIDDE (UTC) / ANSUL / CRYPTZO
207	PRESSURE SWITCH	KIDDE (UTC) / ANSUL / CRYPTZO
208	MANUAL ACTUATOR	KIDDE (UTC) / ANSUL / CRYPTZO
209	MANIFOLD CHECK VALVE	KIDDE (UTC) / ANSUL / CRYPTZO
210	AGENT RELEASE PANEL	RAVEL / FIRE FITE / VIGNAHARATA
211	CONVENTIONAL DETECTORS	SYSTEM SENSOR / SIEMENS / RAVEL
212	TALK BACK SYSTEM	GST / A^2 / ROYAL ELECTRONICS
213	PANEL PROTECTION SYSTEM	CEASEFIRE / KANEX / FIRE DETEC

214	PA RACK	NETCAB / NET RACK
215	**HVAC** BAFFLES SYSTEM	Oorja/ Cani
216	CHILLER UNIT	CLIMAVENETA / TRANE / DAIKIN / CARRIER / BLUE STAR
217	AIR COOLED SCREW CHILLER LOW TEMPERATURE	CLIMAVENETA / TRANE / DAIKIN / CARRIER / BLUE STAR
218	AIR COOLED SCREW CHILLER MEDIUM TEMPERATRE	CLIMAVENETA / DAIKIN / VOLTAS
219	VARIABLE FREQUENCY DRIVE STARTER PANEL	Danfos / Siemens / Schnider / ABB / L&T
220	VARIABLR PRIMARY CHILLED WATER PUMPS	ARMSTRONG / GRUNFOS / XYLEM
221	VFD LOGICAL CONTROL PANEL (FOR VARIABLE PRIMARY FLOW OPERATION)	ARMSTRONG / GRUNFOS / XYLEM
222	PAC UNIT	Climaventa / Flakt wood / schinder / Blue Box / Vertive
223	CHILLED WATER PAC	Climaventa / Flakt wood / schinder / Blue Box / Vertive
224	DX PAC	Climaventa / Flakt wood / schinder / Blue Box / Vertive
225	SplitUnit (5 Star as per BEE) /	Daikin, Mitsubishi, Toshiba,O-General,Blue Star,HitachiMidea, LG
226	Double Skin Floor Mounted Doas - Chilled Water Type	VTS / Systemair / Zeco/Vayhan/Citizen
227	IDEC-UNIT	HMX / HUMIDIN
228	AIR HANDLING UNITS, FAN SECTION UNITS	ZECO / EDGETECH / SYSTEMAIRE / FLAKTWOOD/ NUTECH/ YORK/ VTS/ HUMIDIN/ CASILICA
229	COPPER REFRIGERANT PIPING	Janaya / Nippon / Mandev / Mexflow / PTP-K-Series
230	LADDER TYPE CABLE TRAY	Profab / EAE / Indiana / Patny
231	PERFORATAED TYPE CABLE TRAY	Profab / EAE / Indiana / Patny
232	CONDENSATE DRAIN PUMP	Aspen / Cruise/Ashirwad
233	MAKE UP WATER PIPE	Supreme/ Ashirwad / Finolex / Prince
234	EGG CRATE GRILLE	Systemair / Airmaster / Mapro / Carryiare /

		Dynacraft
235	PERFORATED FLOOR TILE WITH OPPOSED BLADE DAMPER (OBD)	Unitle / Yemag
236	VENTILATION UNITS FANS - INLINE, CABINET, CENTRIFUGAL, TUBE AXIAL, WALL MOUNTED, MIXED FLOW, ETC	Nictora / Flakt /Greenheck / Carryaire / Airflow / Kruger / Maico Dynair
237	KITCHEN DRY SCRUBBER WITH SISW FAN	Rydair / Espair /Trion /Emerald
238	NRV VALVE	Audco / Danfoss / UTAM / Advance / Zoloto / Sant
239	WATER SIDE MS PIPING - CLASS C	Tata/Jindal/SAIL
240	BUTTERFLY, BALANCING,	Audco / Danfoss / UTAM / Advance / Zoloto / Sant
241	Y'-STRAINER	Sant/Emerald/UTAM/Advance / Zoloto / Sant
242	BALL VALVE FOR Y-STRAINER	Leader/R.B. Italy/UTAM / Zoloto / ITAP / Sant / Danfoss / Advance
243	BALL VALVE WITHOUT STRAINER	Leader/R.B. Italy/UTAM / Zoloto / ITAP / Sant / Danfoss / Advance
244	PRESSURE INDEPENDENT TYPE DYNAMIC BALANCING CUM FLOW CONTROL VALVE.	Flowcon / Danfoss / Delta - P/ Frese / Beilimo / Advance / Siemens
245	BTU METER FOR METERING	Kamstrup/Siemens/Sharky / Danfoss FORBMARSHALL / Shanitech / Sontay / Omricorn / DIEHL/ Belimo / Landis / Gyre
246	FLOW METER	Kamstrup/Siemens/Sharky / Danfoss FORBMARSHALL / Shanitech / Sontay / Omricorn / DIEHL/ Belimo / Landis / Gyre
247	AUTOMATIC AIR VENT.	Anergy / ITAP / RB
248	THERMOMETER	Waree/Acutherm Italy/Dwyer / Omricron
249	THERMOWELL	Anergy / ITAP / RB
250	PRESSURE GAUGE (GLYCERINE FILLED)	Fieldmarshell / H-Guru / Fibig / Dwyer/Waree / Baumer
251	CONDENSATE DRAINPIPE	Supreme/ Ashirwad / Finolex / Prince
252	PRESSURE REGULATING VALVE	RB / Danfoss
253	FLEXIBLE RUBBER	Cori / Easyflex

	BELLOWS	
254	PRESSURE MAINTAINING STATION	Anergy / Savcon / K D Agencies
255	LOWSIDE G.S.S DUCTING AS PER SMACNA STANDARDS	Rolastar / Camduct / Zeco / Vedha / Westerair Air / Devduct
256	ROUND DUCT	G.P. Spiro/Westerair Ducts / Sevenstar / Spiral Tube / Devduct
257	MS DUCT FOR KITCHEN EXHAUST	Devduct / Kanva cooling / Sree Fabricators
258	ALUMINIUM DUCTING FOR MRI	G.P. Spiro/Westerair Ducts / Sevenstar / Spiral Tube / Devduct
259	FRP DUCTING	QMAX Composites / FRP lining services /
260	DOUBLE SKIN PLENUM	ZECO / EDGETECH / SYSTEMAIRE / WAVES / AIRCOIL
261	ACOUSTIC INSULATION	Armacell/ K-Flex/Aeroflex/Durkflex
262	THERMAL INSULATION	Armacell / K-Flex / Aeroflex / Thermobreak / Trocilin / Durkflex
263	BUTTERFLY DAMPER - CIRCULAR - SINGLE FLAP-GI	Systemair / Airmaster / Carryaire / Vedha / Syncro / Cosmos
264	ROUND FLEXIBLE DUCTS WITH INSULATION	ATCO/Supaflex/Sevenstar/Ductmaster / Cosmos
265	SPILL AIR PLENUM BOX.	Syncro / Vedha / Kanva Cooling
266	VOLUME CONTROL OPPOSED BLADE DAMPER (QUADRANT TYPE)	Systemair/ Airmaster/Carryaire / Vedha / Syncro / Cosmos
267	BACK DRAFT DAMPER	Systemair/ Airmaster/Carryaire / Vedha / Syncro / Cosmos
268	COLLAR DAMPER - OPPOSED BLADE TYPE	Systemair/ Airmaster/Carryaire / Vedha / Syncro / Cosmos
269	HIT & MISS DAMPER - AL.	Systemair/ Airmaster/Carryaire / Vedha / Syncro / Cosmos
270	PLAQUE TYPE SQUARE DIFFUSER - AL.	Systemair / Airmaster / Mapro / Carryiare / Dynacraft / Cosmos
271	ROUND DIFFUSER - AL.	Systemair / Airmaster / Mapro / Carryiare / Dynacraft / Cosmos
272	MOTORIZED VOLUME CONTROL OPPOSED BLADE DAMPER - STANDARD TYPE	Systemair/ Airmaster/Carryaire / Vedha / Syncro / Cosmos

273	FIRE DAMPER WITH OPPOSED BLADE (FUSIBLE LINK TYPE) - EXTENDED SLEEVE TYPE - WITH 450 MM SLEEVE	Greenheck/ Ruskin Titus / Systemair / Airmaster / Carryiare
274	MOTORISED FIRE & SMOKE DAMPER WITH OPPOSED BLADE - EXTENDED SLEEVE TYPE - WITH 600 MM LONG	Greenheck/ Ruskin Titus / Systemair / Airmaster / Carryiare
275	SLOT DIFFUSERS	Systemair/Airmaster/Sachin / Vedha / Mapro / Cosmos
276	GRILLES - AL.	Makes: Systemair/Airmaster/Sachin / Vedha / Syncro / Mapro / Cosmos
277	JET NOZZLE - AL.	Systemair/ Airmaster/Carryaire / Vedha / Cosmos
278	LOUVERS - AL.	Systemair/ Airmaster/Carryaire / Vedha / Cosmos
279	VARIABLE AIR VOLUME BOXES (VAV)	Eneffen/Neptronics / Syncro / Cosmos
280	EXHAUST VALVE - AL.	Systemair/ Airmaster/Carryaire / Syncro / Vedha / Cosmos
281	TERMINAL HEPA FILTER MODULE	AAF/Spectrum/Camfil /Pyramid
282	FILTERS FOR FRESH AIR FAN	AAF/Spectrum/Camfil /Pyramid
283	CO (CARBON MONOXIDE) DETECTOR / SENSORS	Greystone /Johnson Controls / Siemens / Produal / Omricorn / MSR
284	TEMPERATURE SENSOR FOR AHUS	Greystone/Johnson Controls / Siemens / Produal / Omricorn
285	HYDROGEN DETECTOR / SENSORS	Greystone / Siemens / Produal / Omricorn/Ambitronics
286	Temperature / Rh Sensor For Ot Touch Panel	Schnieder / Siemens / JCI / DIGISENSE
287	VRF Type Varaiable Refrigerant Flow System	Daikin/Toshiba /Blue star/Voltas/carrier
288	UV lamp (UL Listed)	Honeywell Edgetech (American Collaboration) IAQURE UltrafreshLynserve
289	Motor	BharatBijlee,ABB,Siemens,Kirloskar,Hi ndustan Motor
290	Variable Frequency Drive (VFD)	ABB,Danfoss, Fuji Electric, Siemens, Yaskawa
291	IBMS	SIEMENS/ JCI / CARRIER AUTOLOGIC / ENEFFEN

292	Operator Workstation	HP / DELL / LENOVA
293	Printer	HP/SAMSUNG/CANON
294	Color Monitor/Multicolor Graphics	CLIENT
295	monitor Mouse (Optical)	LG / SAMSUNG / MICROSOFT SIEMENS / CARRIER
296	GUI Software	HONEYWELL-TREND / TRANE / SIEMENS-PXC.MODULAR, / JCIMETASYS NCE
297	DDC Controller	HONEYWELL-TREND / TRANE / SIEMENS-PXC.MODULAR, / JCIMETASYS NCE
298	Interfaces / Router / Gateways / Network	HONEYWELL-TREND / TRANE / SIEMENS-PXC.MODULAR, / JCIMETASYS NCE
299	Controllers Immersion type temperature sensor	HONEYWELL-TREND / TRANE / SIEMENS-PXC.MODULAR, / JCIMETASYS NCE
300	Grill, Diffuser, Fire Damper, Fire Damper, Volume Control Damper	SYSTEM AIR /CARRYAIRE/ AIRMASTER/ AIR FLOW/ CONAIR/ DYNACRAFT
301	Hydrogen Sensor	MSR / PRITECH/AMBETRONICS/OMICRON
302	Passenger Lift	Johnson/Kone/Otis/ Schindler

NOTE :-In Case of non-availability of material in the preferred make list, Prior approval of the Engineer-in-Charge shall be taken for material of other make.

BOQ

SL. NO.	DESCRIPTION OF WORK	QTY	UNIT
1	Demolishing cement concrete manually/ by mechanical means including disposal of material to the appropriate disposal area as per direction of Engineer-in-charge.	1.38	m^3
2	Demolishing R.C.C. work manually/ by mechanical means including stacking of steel bars and disposal of unserviceable material to the appropriate disposal area as per direction of Engineer-in-charge.	1.80	m^3
3	Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material to the appropriate disposal area as per direction of Engineer-in-charge. In Cement Mortar	12.50	m^3
4	Dismantling tile work in floors and roofs laid in cement mortar including stacking material to the appropriate disposal area as per direction of Engineer-in-charge. For thickness of tiles 10mm to 25mm	12.00	m^2
5	Dismantling roofing including ridges, hips, valleys and gutters etc., and stacking the material to the appropriate disposal area as per direction of Engineer-in-charge. G.S. Sheet	8.00	m^2
6	Disposal of building rubbish / malba / similar unserviceable, dismantled or waste materials by mechanical means, including loading, transporting, unloading to approved municipal dumping ground or as approved by Engineer-in-charge to the appropriate disposal area.	15.70	m^3
7	Earth work excavation by manual means for drains, canals, waste weir, draft, approach channels, key trenches, foundation of Buildings & bridges and such similar works in all kinds of soils, as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter, excavated surface levelled and sides neatly dressed disposing off the excavated stuff or sorting & stacking the selected stuff for reuse in a radius of 50 m and lift up to 1.5 m including cost of labour, tools & other appurtenances required to complete the work. In all kinds of soils Depth up to 1.5 m	40.03	m^3

8	Earth work excavation by manual means for drains, canals, waste weir, draft, approach channels, key trenches, foundation of Buildings & bridges and such similar works in all kinds of soils, as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter, excavated surface levelled and sides neatly dressed disposing off the excavated stuff or sorting & stacking the selected stuff for reuse in a radius of 50 m and lift up to 1.5 m including cost of labour, tools & other appurtenances required to complete the work. Depth exceeding 1.5m, but not exceeding 3m	11.34	m^3
9	**Filling available excavated earth** (excluding rock) in trenches, plinth, sides of foundations and other similar works etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift up to 1.5 m.	51.37	m^3
10	**Filling approved earth** (excluding rock) in trenches, plinth, sides of foundations and other similar works etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	4.00	m^3
11	Providing and injecting **chemical emulsion for Pre-constructional Anti-Termite Treatment**, creating continuous chemical barrier under and around the column pits, walls, trenches, basement excavation, top surface of the plinth filling, junction of wall and floor, along the external perimeter of building, expansion joints, over the top surface of consolidated earth on which apron is to be laid, surrounding of pipes and conduits with Chlorpyriphos 20% E.C. / Lindane 20% E.C. @ 3.19 l/m2 including cost of chemical, diluting in water to one percent concentration, labour, usage charges of machinery, complete as per specifications.	12.25	m^2
12	Providing and laying in position Cement Concrete for levelling course for all works in foundation. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed, laid in layers not exceeding 150 mm thickness, well compacted using plate vibrators, including all lead & lifts, cost of all materials of quality, labour, Usage charges of machinery, curing, and all the other appurtenances required to complete the work as per technical specifications. Mix 1:4:8 Using 40 mm nominal size graded crushed coarse aggregates. Rate to be inclusive of the cost of Formwork/Shuttering.	2.88	m^3

13	Providing and laying in position Cement Concrete for **all Sub structures of building, Irrigation works, Sub structure works of bridges, Drain works & other parallel works from 0.50m to 3.50 m height**. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers, laid in layers, well compacted using needle vibrators, providing weep holes wherever necessary, including all lead & lifts, cost of all materials of quality, confirming to the requirements of relevant IS codes, labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. M25 Design Mix Using 20 mm nominal size graded crushed coarse aggregates. Rate to be inclusive of the cost of Formwork/Shuttering.	8.91	m^3
14	Providing and laying in position Cement Concrete for all **Super structures of building , Road works, Water works, Irrigation works & super structure works of bridges upto 3.50 m height**. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers laid in layers, well compacted using needle vibrators. The cost includes all lead & lifts, cost of all materials, quality confirming to the requirements of relevant IS codes , labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. M25 Design Mix Using 20 mm nominal size graded crushed coarse aggregates. Rate to be inclusive of the cost of Formwork/Shuttering.	2.72	m^3
15	Providing and laying in position Cement Concrete for all **Super structures of building , Road works, Water works, Irrigation works & super structure works of bridges upto 3.50 m height**. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers laid in layers, well compacted using needle vibrators. The cost includes all lead & lifts, cost of all materials, quality confirming to the requirements of relevant IS codes , labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. M25 Design Mix Using 20 mm nominal size graded crushed coarse aggregates. Rate to be inclusive of the cost of Formwork/Shuttering and the Lifting charges upto 6.60m level from the Ground level. Also, formwork for staging & base preparation is included.	2.72	m^3

16	Providing and laying in position Cement Concrete for all **Super structures of building , Road works, Water works, Irrigation works & super structure works of bridges upto 3.50 m height**. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers laid in layers, well compacted using needle vibrators. The cost includes all lead & lifts, cost of all materials, quality confirming to the requirements of relevant IS codes , labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. M25 Design Mix Using 20 mm nominal size graded crushed coarse aggregates. Rate to be inclusive of the cost of Formwork/Shuttering and the Lifting charges upto 6.60m level from the Ground level. Also, formwork for staging & base preparation is included.	4.59	m^3
17	Supplying, fitting and placing **TMT FE 550 / 550D Steel Reinforcement** including cost of all materials, machinery, labour, cleaning, straightening, cutting, bending, hooking, lapping/welding joints, tying with binding wire / soft annealed steel wire and other ancillary operations complete as per drawing and technical specification. Buildings.	2.53	t
18	Providing and fixing Structural Steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete including cost of materials, labour, usage charges of machinery complete as per specifications and as per directions of the Engineer-in-Charge.	102.60	kg
19	Providing and constructing load bearing wall with **Solid Concrete blocks of size 400x200x200mm** having block density more than 1800kg/m3 and minimum compressive strength of 4.00 N/mm2 conforming to IS 2185 (Part - I) - 2005 and constructed with CM 1:4 as per IS 2572:2005 including cost of all materials, labour, scaffolding and curing, usage charges of machinery etc complete as per specifications.	45.29	m^2

20	Providing and constructing load bearing wall with **Solid Concrete blocks of size 400x150x200mm** having block density more than 1800kg/m3 and minimum compressive strength of 4.00 N/mm2 conforming to IS 2185 (Part - I) - 2005 and constructed with CM 1:4 as per IS 2572:2005 including cost of all materials, labour, scaffolding and curing, usage charges of machinery etc complete as per specifications.	21.30	m^2
21	Providing and constructing load bearing wall with **Solid Concrete blocks of size 400x100x200mm** having block density more than 1800kg/m3 and minimum compressive strength of 4.00 N/mm2 conforming to IS 2185 (Part - I) - 2005 and constructed with CM 1:4 as per IS 2572:2005 including cost of all materials, labour, scaffolding and curing, usage charges of machinery etc complete as per specifications.	5.88	m^2
22	Providing 15 mm cement plaster on the rough side of single or half brick wall of mix 1:4 (1 cement: 4 fine sand) including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge.	113.49	m^2
23	Providing 18 mm cement plaster in two coats under layer 12 mm thick cement plaster with cement mortar 1:5 (1 cement : 5 coarse sand) and a top layer 6 mm thick cement plaster with cement mortar 1:3 (1 cement : 3 coarse sand) finished rough with sponge 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 and as per directions of Engineer-in-charge.	137.03	m^2
24	Finishing walls with water proofing cement paint of required shade :New work (Two coats applied @ 4.84 kg/10 m^2) to give an even shade after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge.	113.49	m^2

25	Finishing walls with 100% Premium acrylic emulsion paint having VOC less than 50 g/L and UV resistance as per IS 15489:2004, Alkali & fungal resistance, dirt resistance exterior paint of required shade (Company Depot Tinted) with silicon additives, New work (Two coats applied @ 1.43 L/ 10 m². Over and including priming coat of exterior primer applied @ 0.90 L/10 m² with paint of approved quality to give an even shade, after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge.	137.03	m^2
26	Providing and Applying high build Acrylate Copolymers - based elastomeric waterproof coating for external wall, parapet & Chajja, which is single component, cold applied, acrylic emultion polymer. Apply coat 1st coat with 10% dilution water and 2nd coat without dilution @ 0.27L/m2 in 2 coats to achieve DFT of 110 microns, The material having followed technical properties: Attains hairline crack bridging up to 1 mm, Elongation of >120 % as per ASTMD 412; Tensile strength 1.50 Mpa per ASTM D 412, Pull off adhesion, 1.5Mpa as per ASTM D4541, including priming the surface with 1 coat diluted with water in the ratio 2:1 spreading @ 0.125 L/m2 as self-priming coat. The finished cost to include surface preparation, making coving at Junction, treatment of cracks completely as per specification.	53.43	m^2
27	Providing and laying vitrified **floor tiles with thickness 9-10 mm** in different sizes with water absorption less than 0.08% and conforming to IS: 15622, of approved make, in all colours and shades, laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand), jointing with grey cement slurry @ 3.3 kg/ m2 including grouting the joints with white cement and atching pigments etc., complete. Size of Tile 500x500 mm.	26.40	m^2
28	Providing & fixing and laying pressed clay tiles (as per approved pattern 20 mm nominal thickness of approved size) on roofs jointed with cement mortar 1:4 (1 cement: 4 coarse sand) mixed with 2% integral water proofing compound, laid over a bed of 20 mm thick cement mortar 1:4 (1 cement : 4 coarse sand) and finished neat complete.	4.20	m^2

29	PVC Pipe - OD 75mm and 6 Kg/sqcm.	2.40	m
30	Providing and fixing **Sewer (SWR) pipes**, including all fittings, This includes jointing of pipes & fittings with one step solvent cement, trenching, refilling & testing of joints complete as per direction of Engineer in Charge. 75mm nominal dia pipes.	8.00	m
31	Providing and fixing **Sewer (SWR) pipes,** including all fittings, This includes jointing of pipes & fittings with one step solvent cement, trenching, refilling & testing of joints complete as per direction of Engineer in Charge. 110mm nominal dia pipes.	9.00	m
32	Providing and fixing **Sewer (SWR) pipes**, including all fittings, This includes jointing of pipes & fittings with one step solvent cement, trenching, refilling & testing of joints complete as per direction of Engineer in Charge. 150mm nominal dia pipes.	15.00	m
33	Constructing **brick masonry chamber** for underground C.I. inspection chamber and bends with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) C.I. cover with frame (light duty) 600X850 mm internal dimensions, total weight of cover with frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg), R.C.C. top slab with 1:1.5:3 mix (1 cement : 1.5 fine sand : 3 graded stone aggregate 20 mm nominal size), foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand), finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design: Inside dimensions 600x 850 mm and 45 cm deep for pipe line with three or more inlets : With common burnt clay (non modular) bricks of class designation 3.5	3.00	1 chamber

34	Extra for **depth beyond 45 cm of brick masonry chamber** : For 600x850 mm size With common burnt clay (non modular) bricks of class designation 3.5.	3.00	1 chamber / m
35	Labour charges for works of plumber and carpenter and etc for Door repairs and fixing of plumbing fixtures (shifting of existing tank,fixing of old pipe lines and serviceing).	2.00	Nos.
36	Design, supplying, erecting testing and commissioning of - Passenger lift with speed of 1mtr per second, variablevoltage variable frequency drive, with or without machine room for the available well size, operating at 415 V 3 phase 50 cycles AC supply,powder coated / Stainless Steel car entrance doors enclosures with suitable colour vinyl flooring, LED car illumination, emergency light,intercom and fan as desired by the user, central opening / side opening door with or without attendant operation, 7 segment display buttons,call register indicator, fireman drive, SS handrails inside car, full length infrared curtain in car door, automatic rescue device with batteries,voice announcing in regional/ international languages, Braille buttons with one year warranty and maintenance with necessary scaffolding andminor civil works like fixing of guide rail, counter weight etc.,The total product and services shall adhere to IS 14665/2016 (with latestamendments) part/section 1 to 5 with regards to general guidelines of fire safety rated doors, MRLL beams, pressure switch, manual changeover for doors during emergency, ARD of 10 times with sufficient battery back up and standard dimensions of chair car and door openings forall sizes and capacities of lifts including fitness certificate and duly observing all other safety norms prescribed and adhere to CPWDspecifications, PCB Norms, National Electricity Code (NEC), NBC-2016, IEC and Karnataka State Lifts, Escalators and Passengers ConveyersAct 2012 and Rules 2014. The Supplier shall be registered in Government Electrical Inspectorate in the State of Karnataka. D With Out Machine Room-SS Finish 6 Passengers and 3 stops Johnson,Kone,Otis and Schindler	1.00	Job
37	Supplying heavy gauge PVC conduit pipe ……mm dia …….mm thick confirming to IS 2509 with suitable size bends, metal/PVC junction boxes, adhesive paste etc., and running before concreting the slab. The conduit should be tied to the reinforcement rods by using binding wires and unused ways of junction boxes and pipe ends should be covered using PVC end enclosures, run with 18SWG GI fish wire wherever necessary 25mm dia 2mm thick	100.00	Mtr

37	Supplying and fixing surface/flush mounting unbreakable PVC modular box suitable for mounting modular switch plates with due groove cutting in Brick/C.C wall, including necessary rawl plugs, Machine/NF screws etc., complete. 3 Way	10.00	Each
38	4-5 Way	3.00	Each
38	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. 3 Module	10.00	Each
39	4 Module	3.00	Each
39	Supplying and fixing of LED Bulkhead of 10W with IP65 protection and IK 08 impact resistance suitable for surface and wall mounting applications. CG,Wipro,Philips	6.00	Each
40	Supplying and fixing of modular switch & connected accessories on existing modular switch plate as per IS 3854 and IS 1293 6A One Way Switch	10.00	Each
40	6A Two Way Switch	2.00	Each
41	6A Three Way socket	10.00	Each
41	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. 6-32Amps SP	3.00	Each
42	40 A DP	3.00	Each
42	50-63 A TPN	2.00	Each
43	Supplying, fixing and wiring Residual current circuit breaker (RCCB) 240/450V upto 300mA sensitivity on existing wood/panel board.63 A 4 pole	1.00	No

43	Supplying and fixing Moulded Case Circuit Breaker (MCCB) over the existing wood/panel board using necessary screws, bolts, nuts, necessary phase separators, handle and wiring complete. Protection of Overload and Short circuitwith adjustable thermal magnetic release, Micro processor release shall have Earth Fault as per IS/IEC 60947-2 . (Icu=100% lcs). In 4P MCCB, all Poles should have protection for Short-Cicrcuit/Over Load. For Microprocessor MCCBS Facility for segregating Priority and Non-Priority loads must be available in the MCCB. MCCB shall be provided with double insulation (insulation between front cover and internal power circuits to avoid any accidental contact with live current carrying path with the front cover open). Multi-pole breakers shall be designed to break all the poles simultaneously and they shall have a single mechanism. FOUR Pole 100 A 25 kA	1.00	Each
44	Supplying 100 A rated 3phase with neutral bus bar using required capacity electrolytic aluminium 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., complete 100 A 4 x 30 x 6 mm Aluminium Strips	1.00	m
44	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. 40 x 40 x 6 mm	5.00	m
45	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 7tanks treatment with powder coated paint and finally finished with approved colour etc., complete. 14 SWG	22800	sqcm
45	Supplying and fixing of LED type panel board indicating lamp with required colour suitable for 230/440VAC. 50 Hz 12/24V D.C	3.00	Each
46	Supplying of 1.1 kV, XLPE or Heat resistant PVC insulated, PVC exutruted Inner SeathArmoured LT UG Cable as per IS-1554 (Part1) or IS-7098 Part-1, Armouring stripthickness and resistivity as per IS-3975 35 Sqmm, 4 Core, (15 GI Strips - 4 x 0.8 mm)	120.00	Mtr

46	Laying of cable in Existing Trench/GI pipe/Stone Ware/RCC Hume pipe using Wooden/Aluminum Rollers as directed by the departmental staff 35 to 95 Sqmm	120.00	Mtr
47	Aluminium End Terminal (Lug) 32 Sqmm	25.00	No
47	Brass Cable Gland 32 mm	4.00	No
48	Supplying and fixing regular MCB distribution boards on wall/ood board / flush mounting using required clA, bolts, nuts etc., with provision for fixing suitable type capacity MCB's single phase/3 phase/single door with powder coatedpainting Made out of 14 SWG MS enclosure.III - Double Door 4 Way TP & N	1.00	Each
48	Wiring for lighting/power circuit using one of FRLS PVC insulated 1100V grade, multistrand copper wire with low conductor resistance single core in open or wiring with specified IS-694:confirming to latest amendments. 1.5 mm2	250.00	Meter
49	2.5 mm2	100.00	Meter
49	4 mm2	50.00	Meter
50	10 mm2	15.00	Meter
50	16 mm2	20.00	Meter
51	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thickincluding accessories, and providing masonry enclosure withcover plate having locking arrangement and watering pipe of2.7 metre long etc. with charcoal/ coke and salt as required.	2.00	set
51	Supplying and laying 25 mm X 5 mm G.I strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with G.I. nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of G.I. nut bolt & spring washer spaced at 50mm)	60.00	Meter