Phones: 03712 - 268107/268077
Fax: +91 (03712) 268007
Website: neriwalm.gov.in

Dolabari
P.O. Kaliabhomora
Tezpur – 784 027,
Assam (India)

NORTH EASTERN REGIONAL INSTITUTE OF WATER AND LAND MANAGEMENT (NERIWALM)

An Institute under the Ministry of Jal Shakti, Govt. of India
(Registered under the Societies Registration Act, 1860)

NO.NRWM/CONSTN/RESIDUAL/288/2019-20/ **Dated: 05.11.19**

NOTICE INVITING e-TENDER

ONLINE tenders are invited by the Director, NERIWALM, Tezpur from First Class Registered Contractors/Firms/Consortuim having wide experience and knowledge on the execution of multi-dimentional nature of work mentioned below.

The tender should contain **Part-I (TECHNICAL BID)** and **Part-II (FINANCIAL BID)** and should be submitted **ONLINE** only addressed to the Director, NERIWALM, Tezpur-784027. ONLINE posting of tender will start from **06.11.2019** and the last date for submission is **29.11.2019 upto 5.00 PM.** The tenders will be opened at **11.00 AM on 02.12.2019** in the conference room of NERIWALM in presence of the bidders or their authorized representatives if any. In the event of **02.12.2019** being declared a holiday, the tender/bids will be opened on the next working day at the same time and place.

Interested bidders may view and download detailed tender documents along with terms and conditions from the website of NERIWALM **www.neriwalm.gov.in.** Interested bidders may participate in the bidding process through **CPP Portal.**

Sl. No.	Name of work	Estimated amount (₹)	Completion time	Earnest Money
1.	Supply, installation and commissioning of visual display and control system, exterior development including cafeteria and parking, roofing and associated civil and electrical works of the auditorium.	₹ 2,19,20,000.00	04(four) months from the date of signing of the agreement.	2% of the estimated amount.

05/11/19

Deputy Director(Admin)

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Dolabari
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NORTH EASTERN REGIONAL INSTITUTE OF WATER AND LAND MANAGEMENT (NERIWALM)

An Institute under the Ministry of Jal Shakti, Govt. of India
(Registered under the Societies Registration Act, 1860)

NO.NRWM/CONSTN/RESIDUAL/288/2019-20/ 2964 **Dated 05.11.19**

NOTICE INVITING e-TENDER

1. **ONLINE tenders** are invited by the Director, NERIWALM, Tezpur from First Class Registered Contractors/Firms/Consortuim having wide experience and knowledge on the execution of multi-dimentional nature of work mentioned below.

2. The tender should contain **Part-I (TECHNICAL BID)** and **Part-II (FINANCIAL BID)** and should be submitted **ONLINE** only addressed to the Director, NERIWALM, Tezpur-784027. ONLINE posting of tender will start from **06.11.2019** and the last date for submission is **29.11.2019 upto 5.00 PM.** The tenders will be opened at **11.00 AM on 02.12.2019** in the conference room of NERIWALM in presence of the bidders or their authorized representatives if any. In the event of **02.12.2019** being declared a holiday, the tender/bids will be opened on the next working day at the same time and place.

3. Interested bidders may view and download detailed tender documents along with terms and conditions from the website of NERIWALM **www.neriwalm.gov.in.** Interested bidders may participate in the bidding process through **CPP Portal.**

4. The Director, NERIWALM reserves the right to accept/reject any or all tender (s) without assigning any reason thereof and it is not binding on the Director to accept the lowest rate/amount.

Sl. No.	Name of work	Estimated amount (₹)	Completion time	Earnest Money
1.	Supply, installation and commissioning of visual display and control system, exterior development including cafeteria and parking, roofing and associated civil and electrical works of the auditorium.	₹ 2,19,20,000.00	04(four) months from the date of signing of the agreement.	2% of the estimated amount.

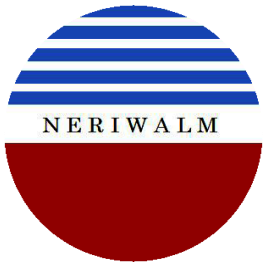
05/11/2019

Deputy Director (Admin)

Copy to:

1. The PA attached in the Director's Office for kind information of Director.
2. The Professor (WRE) & CVO, NERIWALM for kind information.
3. The Assistant Director(Civil), NERIWALM, Tezpur for information and necessary action.
4. The Accounts Officer, NERIWALM, for information & necessary action.
5. The Assistant Engineer (Civil), NERIWALM, for information and necessary action.
6. The O.C., Library, NERIWALM for information and requested to make available the copy of the advertisement published in the Newspaper for record of the Maintenance Section.
7. The Notice Board, NERIWALM, Tezpur for wide circulation.
8. NERIWALM website : www.neriwalm.gov.in. & CPPP Portal for publishing.

TENDER FOR SUPPLY, INSTALLATION AND COMMISSIONING OF VISUAL DISPLAY AND CONTROL SYSTEM, EXTERIOR DEVELOPMENT INCLUDING CAFETERIA AND PARKING, ROOFING AND ASSOCIATED CIVIL AND ELECTRICAL WORKS OF THE AUDITORIUM AT NERIWALM DOLABARI, TEZPUR, ASSAM.



Issued by
Director, NERIWALM,
Tezpur - 784027

BID DOCUMENTS

Bid Documents Includes: -

Section 1. Notice Inviting Tender

Section 2. Instructions to Bidders

Section 3. General (Commercial) Conditions of the Contract

Section 4. Special Conditions of the Contract

Section 5. Format of Performance Bank Guarantee (PBG)

Section 6. Bid Submission Form

Section 7. Technical Specifications and Compliance Sheets

Section 8. Un-priced BOQ (Annexure – I)

NORTH EASTERN REGIONAL INSTITUTE OF
WATER AND LAND MANAGEMENT (NERIWALM)
Dolabari, Tezpur, Assam 784027

NO.NRWM/CONSTN/RESIDUAL/288/2019-20/ **Dated 05.11.19**

NOTICE INVITING e-TENDER

Electronic tenders are invited from eligible bidders with sound financial background and sufficient required work experience for taking up the following works.

SL.No.	Name of the work.	Estimated Cost (Rs.)	Earnest Money (Rs.)	Cost of Tender Documents	Completion time.
1.	Supply, installation and commissioning of visual display and control system, exterior development including Cafeteria and parking, roofing and associated civil and electrical works of the auditorium of NERIWALM at Dolabari, Tezpur, Assam.	Rs. 2,19,20,000.00	Rs.4,38,400.00	Rs. 5,000.00	04(four) months from the date of signing of the agreement.

Deputy Director(Admin),
NERIWALM

SECTION-1

NOTICE INVITING e-TENDER

NO.NRWM/CONSTN/RESIDUAL/288/2019-20/ **Dated 05.11.19**

ONLINE tenders are invited by the Director, NERIWALM, Tezpur from eligible bidders for "Supply, installation and commissioning of visual display and control system, exterior development including Cafeteria and parking, roofing and associated civil and electrical works of the auditorium of NERIWALM at Dolabari, Tezpur, Assam". Submission of Online Bids is mandatory for this Tender.

- Last date & time for Online submission of Bids : **29.11.2019 upto 5.00 PM.**

- Online Opening of Technical & Financial Part : **02.12.2019 at 11.00 AM.** (opening of Financial to be notified later only to Technically Qualified Bidders)

Tender Fee (non refundable) amounting to Rs. 5000.00 (Rupees Five Thousand) only shall be submitted along with tender by Demand Draft/Bank Draft/Banker's Cheque in favour of "NERIWALM Revenue A/C"

Earnest Money amounting to 2% of the estimated amount by Demand Draft/Bank Draft/Banker's Cheque in favour of "The Director, NERIWALM, Dolabari, Tezpur." payable at Tezpur from a Scheduled Bank shall be submitted along with the tender.

Tender fee and EMD amount exempted for NSIC/MSME units. Subject to submission of valid NSIC / MSME certificate.

Eligibility Criteria

1. Average Annual Financial Turnover during the last 3 years, ending 31st March 2018, should be at least ₹ 150 Lakhs.

(Please submit Audited Annual Report (Balance Sheet and Profit & Loss Account) for the last three financial years).

2. Bidder should have experience of having successfully completed similar nature of work during the last 3(three) years.

i. One similar order of executed value not less than ₹ 1.50 Crores.

ii. Two similar order of executed value of not less than ₹ 1.0 Crore.

iii. Three similar order of executed value of not less than ₹ 0.70 Crore.

(Please submit copy of Work order and Completion Certificate from the Client).

3. The Bidder should not have been barred / black listed by any PSU/Govt. Dept. in doing business with them (Please submit undertaking).

4. The Bidder should be registered for GST and PAN no (Submit copy of Registration Certificate and PAN Card).

5. The Bidder should have valid licenses of appropriate category for electrical works and civil works. (Please submit documentary proof)

6. The Bidder should be registered in ESIC & EPF authority, if applicable (submit copy of Registration Certificate)

7. The bidder should possess valid and uptodate Labour Licence.

Note: Bidder must provide necessary supporting documents as proof in respect of the eligibility criteria mentioned above.

Tenders received without EMD / inadequate EMD, and without the requisite Tender Fee shall summarily be rejected

NERIWALM reserves the right to accept or reject any or all the tenders without assigning any reason.

SECTION-2

INSTRUCTIONS TO BIDDERS

2.1 INTRODUCTION (DEFINITIONS)

2.1.1 "Purchaser" means North Eastern Regional Institute of Water and Land Management (NERIWALM), Dolabari, Tezpur – 784027 (Assam).

2.1.2 "Bidder" means the individual or firm or corporate body or a consortium of any two who participates in the tender and submits its bid.

2.1.3 ''Goods/Products" means all the hardware equipments, instruments, tools, machinery etc., and/or other materials like components/parts/spares including consumables which the supplier is required to supply to the Purchaser under the Purchase Order.

2.1.4 "Letter of Intent (LOI)" means the communication of the intention of the Purchaser to the Bidder to place the Purchaser Order for the former's offered goods/services.

2.1.5 "Purchase/Work Order" means the order placed by the Purchaser on the Supplier/Contractor/Firm duly signed by the Purchaser's authorized representative to purchase certain goods & services from the vendor/contractor.

2.1.6 "Contract Price" means considerations payable to the supplier/contractor as stipulated in the Purchase or Work Order for performance of specified contractual obligations.

2.2 BIDDER TO BEAR COST OF PURCHASE OF TENDER

The Bidder shall bear all costs associated with the preparation and submission of the bid. The Purchaser in any case will not be responsible or liable for these costs regardless or the conduct of the bidding process.

2.3 AMENDMENT TO BID DOCUMENTS

2.3.1 At any time, prior to the date of submission of bids, the Purchaser may for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the bid documents by amendments.

2.3.2 The amendments/corrigendum will be notified on NERIWALM website. www.neriwalm.gov.in and these amendments will be binding on them. Bidders are advised to visit NERIWALM website regularly for updates on this tender.

2.4 EXTENSION OF TIME

In order to give prospective bidders required time in which to take the amendments into action in preparing their bid, the Purchaser may at its discretion extend the deadline for submission of bid suitably.

2.5 BID PRICE

Price indicated in the schedule shall be **FOR NERIWALM**, Tezpur. Prices should be inclusive of all taxes and duties.

2.6 BIDDERS ELIGIBILITY AND QUALIFICATIONS

Bidder shall furnish as a part of bid documents establishing the bidder's eligibility to carry out the work. The bidder shall also submit documentary evidence in the form of literature, drawing, data on the goods offered.

2.7 BID SECURITY

2.7.1 The Bidder shall submit, as part of BID SECURITY/EMD as mentioned in the NIT. The Bid Security shall be in one of the following forms:-

(a) Demand Draft or Pay Order from a Scheduled Bank in favour of Director, NERIWALM, Dolabari, Tezpur, Assam.

2.7.2 The bid not secured in accordance with the above shall be rejected by the Purchaser as non-responsive.

2.7.3 The Bid Security of the un-successful bidder will be discharged/ returned as promptly as possible. The quoted rates should be valid upto 120 (one hundred twenty) days from the date of opening of the tenders/bids.

2.7.4 The successful bidder's bid security will be discharged upon the bidder's submission of the Performance Guarantee.

2.7.5 The bid security may be forfeited under the following circumstances: -

a) If a bidder withdraws his bid during the period of bid validity specified by the bidder on the bid form.

b) In case of a successful bidder, if he fails to submit the Performance Guarantee within the time prescribed or

c) If he fails to supply the material/carry out the work in terms of the project.

2.7.6 No interest is payable on EMD.

2.8.7 In case of inadequacy or non-submission of prescribed EMD, the tender shall be deemed to be disqualified and shall be summarily rejected in the technical evaluation.

2.8 VALIDITY PERIOD OF BID

Bid shall remain valid for 120 (one hundred twenty) days after the date of bid opening. The bid valid for a shorter period shall be rejected by the Purchaser as non-responsive.

In exceptional circumstances, the purchaser may request the consent of the bidder for an extension to the period of bid validity. The bid security provided under clause 2.7.1 (a) shall also be suitably extended. A bidder accepting the request and granting extension will not be permitted to modify his bid.

2.9 CLARIFICATION OF BIDS

2.9.1 To assist evaluation and comparison of the bids, the Purchaser may at its discretion may ask the bidder for clarification of the bid. The clarification and response from bidder shall be in writing. To assist evaluation and comparison of the bids, the Purchaser at its discretion may ask the bidder for clarification of the bid. The clarification will be asked online through the CPP portal. The clarification and response from bidder shall also be online through the CPP portal.

2.9.2 The Purchaser does not bind himself to accept the lowest or any tender and reserves to himself the right to accept the whole or any part of the tender and altering the quantities offered and tenderer shall supply the same at the rate quoted.

2.10 EVALUATION OF TENDERS

2.10.1 The Purchaser shall evaluate the bids in respect to the substantive responsiveness of the bid or otherwise. The Purchaser shall carry out detailed evaluation of the substantially responsive bids. The

Purchaser shall check the bid to determine whether they are complete, whether any computational errors have been made or required sureties have been furnished.

2.10.2 Arithmetical error shall be rectified on the following basis :-

a) If there is a discrepancy between the unit price and total price that is obtained multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected by the Purchaser.

b) In case of discrepancy between words and figures, the amount in words shall prevail.

2.10.3 A bid determined as substantially non-responsive shall be rejected by the Purchaser.

2.10.4 The Purchaser may waive any minor infirmity or non-conformity or irregularity in the bid which does not constitute a material deviation.

2.10.5 The Purchaser shall evaluate in detail and compare the bids which are substantially responsive.

2.10.6 The evaluation of the ranking shall be carried out on the landed price of goods offered inclusive of all taxes.

2.10.7 The distribution of tendered quantity amongst the technically and commercially complied bidders shall be based on merits of each case.

2.10.8 NERIWALM shall have the sole discretion in deciding the number of parties on whom the orders shall be finally placed.

2.11 PURCHASER'S RIGHT TO VARY QUANTITIES

2.11.1 The Purchaser reserves the right at the time of award of the contract to increase the quantity of the goods and services specified in the schedule of requirements without any change in unit price of the ordered quantity.

2.12 PURCHASER'S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS

The Purchaser does not bind himself to accept lowest or any other tender/bid and has the right to cancel the bidding process and reject all bids at any time prior to award of the contract without assigning any reasons whatsoever and without thereby incurring any liability to the affected bidder on the grounds for the Purchaser's action.

2.13 NOTIFICATION OF SUCCESSFUL BIDDER

2.13.1 Prior to the expiration of the bid period, the Purchaser will notify the successful bidder in writing by registered letter or fax, to be confirmed in writing by registered letter that its bid has been accepted.

2.13.2 Upon successful bidder furnishing of Performance Guarantee, the Purchaser will notify each successful bidder and will discharge its bid bond.

2.14 ISSUE OF LETTER OF INTENT

2.14.1 The issue of **Letter of Intent** shall constitute the intention of the Purchaser to place the Purchase Order/Work Order with the successful bidder.

2.14.2 The bidder shall within 10(ten) days of issue of Letter of Intent give its acceptance along with Performance Guarantee in conformity with the bid documents.

2.15 CANCELLATION OF LETTER OF INTENT

Failure of the successful bidder to comply with the requirement of submission of Performance Guarantee in time shall constitute sufficient ground for the cancellation of the acceptance of bid and forfeiture of the bid bond, in which case Purchaser may make the offer to any other bidder at the discretion of the Purchaser or call for new bids.

2.16 POST BID CLARIFICATIONS

No post bid clarification at the initiative of the bidders shall be entertained and any effort by the bidders to influence the Purchaser in the Purchaser's bid evaluation, bid comparison or award of the contract shall result in rejection of the bid.

2.17 COMPLETION OF WORK

The work should be completed within the date specified in Work Order. No request for extension of completion time will be entertained unless a valid and acceptable reason is given. The Schedule of delivery shall be the essence of the contract.

2.18 SUBMISSION OF BID

Only the following shall be accepted in physical form:

- Tender Fee in the form of Demand Draft/Banker's Cheque/Bank Draft (non-refundable)
- EMD in the form of Demand Draft/Bank Draft/Banker's Cheque.
- Tender documents (Technical Bid) including all sections duly signed and stamped.
- NSIC / MSME registration certificate

All other documents shall have to be submitted in Electronic/Soft form and hard copy of the Technical Bid has to be submitted to the Director's office before the last date & time for Online submission of Bids.

2.19 OPENING OF PRICE OFFER

Price offers of only those bidders whose Techno-Commercial offers are found to be responsive and acceptable to NERIWALM will qualify to be opened online.

2.20 INSTRUCTIONS REGARDING ONLINE BID SUBMISSION

As given in the CPP Portal.

SECTION – 3

GENERAL (COMMERCIAL) CONDITIONS OF THE CONTRACT

3.1 PRICE APPLICABILITY

Prices in the Purchase Order/Work Order shall remain valid for the contract period from the date of signing of formal agreement.

3.2 STANDARDS

The goods supplied under the contract shall conform to the standards mentioned in the Technical Specifications.

3.3 PERFORMANCE SECURITY

3.3.1 Within 15 days of the Contractor/Firm's receipt of Letter of Intent (LOI)/W.O., the contractor/firm shall furnish a Performance Security for the amount specified in special condition of the tender in the form of a Bank Guarantee issued by a schedule Bank from its branch in Tezpur or Guwahati in the prescribed format given in this tender.

3.3.2 The proceeds of the Performance Security shall be payable to the Purchaser as compensation for any loss resulting from the contractor/firm's failure to complete its obligations under the contract.

3.3.3 The Performance Security shall be in the form of Bank Guarantee/Bank Draft/Demand Draft/Banker's Cheque issued by a Scheduled Bank situated in India in favour of Director, NERIWALM, Tezpur. The Performance Security should be for the period of 01(one) year plus 02(two) months.

3.3.4 The Performance Security will be discharged by the Purchaser after completion of the contractor/firm's obligations including any warranty obligations under the contract.

3.5 TRAINING (WHERE REQUIRED)

3.5.1 The Contractor/Firm shall provide training for installation and maintenance staff of the Purchaser free of cost, where required.

3.5.2 The Bidder shall provide all training materials and documents and aids.

3.5.3 Conduct of training of the Purchaser's personnel shall be at on-site in assembly start-up operation, maintenance and/or repair of the supplied goods.

3.6 CHANGE ORDERS

3.6.1 The Purchaser may at any time by written order given to the Supplier/Contractor make changes within the general scope of the contract in any one or more of the following: -

a) Drawings, designs or specifications where goods to be furnished under the contract are to be specifically manufactured for the Purchaser.

b) Place of delivery.

c) Services to be provided by the Supplier/Contractor.

3.7 If any such change causes an increase or decrease in the cost or the time required for the execution of the contract, an equitable adjustment shall be made in the contract price or delivery schedule or both and the contract shall accordingly be amended.

3.8 SUB-LETTING

The Bidder cannot assign or transfer and sub-contract its interest/ obligations under the contract without prior written permission of NERIWALM.

3.9 LIQUIDATED DAMAGES

3.9.1 The date of the delivery of the goods/services stipulated in the acceptance of tender should be deemed to be the essence of the contract and the delivery must be completed not later than the dates specified therein. Extension in delivery period will not be given except in exceptional circumstances. Should, however, deliveries be made after expiry of the contract delivery period and accepted by the consignee, such deliveries will not deprive the

Purchaser of the right to recover Liquidated Damages.

3.9.2 In case the contractor/firm fails to supply the goods/services against the order, the same shall be procured from other suppliers at the cost and risk of the Supplier and the excess money will be recovered from any dues of the party.

3.9.3 For late deliveries, as liquidated damages, a sum equal to 2% of the price of any goods/services not delivered or total order value in case where part delivery is of no use to a Purchaser, for a week or part of a week subject to maximum limit of 10% of the total order will be recovered from the contractor/firm. The Purchaser also reserves the right to cancel the order in such cases and forfeit the EMD/Performance Bank Guarantee and may also debar the contractor/firm for future tenders.

3.9.4 LD can be recovered from any dues of the Contractor/Firm.

3.10 ARBITRATION

3.10.1 In the event of any dispute arising between NERIWALM and the Contractor/Firm in any matter covered by this contract or arising directly or indirectly therefrom or connected or concerned with the said contract in any manner of the implementation of any terms and conditions of the said contract, the matter shall be referred to the Director, NERIWALM who may himself act as sole arbitrator or may name as sole arbitrator an officer of NERIWALM notwithstanding the fact that such officer has been directly or indirectly associated with this contract and the provisions of the Indian Arbitration

Conciliation Act, 1996 shall apply to such arbitration. The contractor/firm expressly agrees that the arbitration proceedings shall be held Tezpur.

3.10.2 The proceedings of arbitration shall be in English language:

3.10.3 In case any supplier wants to take the dispute to a court of law after arbitration award as aforesaid, it is clearly understood that only courts in Tezpur and Guwahati shall have the Jurisdiction.

3.10.4 In case of Public Sector Undertaking/Government Departments

In the event of any dispute or difference relating to the interpretation and application of the provisions of the contracts with any Public Sector Undertaking / Government Department, such dispute or difference shall be referred by either party for Arbitration to the sole Arbitrator in the Department of Public Enterprises to be nominated by the Secretary to the Government of India in-charge of the Department of Public Enterprises. The Arbitration and Conciliation Act, 1996 shall not be applicable to arbitration under this clause. The award of the Arbitrator shall be binding upon the parties to the dispute, provided, however, any party aggrieved by such award may make a further reference for setting aside or revision of the award to the Law Secretary, Department of Legal Affairs, Ministry of Law & Justice, Government of India. Upon such reference, the dispute shall be decided by the Law Secretary or the Special Secretary / Additional Secretary, when so authorized by the Law Secretary, whose decision shall bind the Parties finally and conclusively. The Parties to the dispute will share equally the cost of arbitration as intimated by the Arbitrator.

3.11 RISK PURCHASE

3.11.1 In the event of Contractor/Firm's failure to execute the contract to the satisfaction of the Purchaser, the Purchaser reserves the right :

(a) to reject any part of the Contract executed and withhold payment for such portion of the Contract till such time the defects are rectified to the satisfaction of the Purchaser.

(b) to terminate the Contract by giving 02(two) weeks notice in writing without assigning any reason and to get the Contract executed by other agency at the risk and cost of the Contractor/Firm.

3.12 APPLICABLE LAWS

This contract shall be interpreted, construed and governed by the laws of the Republic of India and the parties hereby submit to the exclusive jurisdiction of the Court at Tezpur and Guwahati having jurisdiction in appeal there from. Any dispute in relation to the contract shall be submitted to the appropriate Court of the Republic of India for determination. The parties to the contract shall continue to fulfill their respective obligations under the contract during the currency of the contract pending the final decision of the Court.

3.13 GENERAL LIEN

Whenever under this contract any sum of money is recoverable from and payable by the Contractor/Firm, the NERIWALM shall be entitled to recover such sum by appropriating in part or in whole the security

deposit of the Contractor/Firm, if a security is taken from the Contractor/Firm. In the event of the Security being insufficient or if no security has been taken from the Contractor/Firm, the balance or the total sum recoverable, as may be, shall be deducted from any sum due to the Supplier or which at any time thereafter may become due to the Contractor/Firm under this or any other contract with NERIWALM. Should this sum be not sufficient to cover the full amount recoverable, the Contractor/Firm shall pay to the NERIWALM on demand the remaining balance due.

3.14 FORCE MAJEURE

If any time, during the continuance of this contract, the performance in whole or in part by either party under obligation as per this contract is prevented or delayed by reasons of any war or hostility, act of the public enemy, civil commotion, sabotage, fire, flood, explosion, epidemic, quarantine restrictions, strike, lockout or acts of God (hereinafter referred to "eventuality"), provided notice of happening of any such eventuality is given by either party to the other within 21 days of the date of occurrence thereof, neither party shall be reason of such an "eventuality" be entitled to terminate this contract nor shall either party have any claim or damages against the other in respect of such non-performance or delay in performance and deliveries under the contract. The contract shall be resumed as soon as practicable after such "eventuality" has come to an end or ceased to exist. In case of any dispute, the decision of Director, NERIWALM , shall be final and conclusive, provided further that if the performance in whole or part of any obligation under this contract is prevented or delayed by reason of any such eventuality for a period exceeding 60 days, either party may at its option, terminate the contract. Provided also that if the contract is terminated under this clause the Purchaser shall be at liberty to take over from the Contractor/Firm at a price to be fixed by the Purchaser, which shall be final, all unused, undamaged and acceptable materials, bought out components and other stores in the course of manufacture which may be in the possession of the Contractor/Firm at the time of such termination, or such portion thereof as the Purchaser may deem fit except such material, as the Contractor/Firm may, with the concurrence of the Purchaser, elect to retain.

3.15 TERMINATION FOR DEFAULT

3.15.1 The NERIWALM, may, without prejudice to any other remedy for breach of contract, by written notice of default, sent to the Contractor/Firm, terminate this contract in whole or in part.

a) if the supplier fails to deliver any or all the goods within the time period (s) specified in the contract, or any extension thereof granted by the Purchaser .

b) if the Contractor/Firm fails to perform any other obligation(s) under the contract; and

c) if the Contractor/Firm, in either of the above circumstances, does not remedy his failure within a period of 15 days (or such longer period as the Purchaser may authorize in writing) after receipt of the default notice from the Purchaser.

d) On a notice period of 30 days.

3.15.2 In the event NERIWALM terminates the contract in whole or in part pursuant to above para the Purchaser may procure, upon such terms and in such manner as it deems appropriate, goods similar to

those undelivered and the Contractor/Firm shall be liable to the Purchaser for any excess cost for such similar goods. However, the Contractor/Firm shall continue the performance of the contract to the extent not terminated.

3.16 TERMINATION FOR INSOLVENCY

The Purchaser may at any time terminate the Contract by giving written notice to the Contractor/Firm, without compensation to the supplier if the Contractor/Firm becomes bankrupt or otherwise insolvent as declared by the competent court provided that such termination will not prejudice or effect any right of action or remedy which has accrued or will accrue thereafter to the purchaser.

3.17 ADD ON ORDER

NERIWALM reserves the right to place Add on order for additional quantity upto 25% of the original quantity at the same rate and terms & conditions of the purchase order within six months from the date of issue of purchase order.

3.18 REPEAT ORDER

3.18.1 In case of any conflict in any of the terms mentioned at Section-4, the same shall prevail over the terms mentioned in other sections.

SECTION – 4

SPECIAL CONDITIONS OF CONTRACT

4.1 TENDER FOR "Supply, installation and commissioning of visual display and control system, exterior development including Cafeteria and parking, roofing and associated civil and electrical works of the auditorium of NERIWALM at Dolabari, Tezpur, Assam".

4.2 PAYMENT TERMS

(i) Payment will be made against submission of Running Account Bill by the Contractor/Firm depending on the progress achieved and the materials delivered at site. However, provision for Secured Advance is applicable as per rules in vogue.

4.3 PAYING AUTHORITY

The Director, NERIWALM, Tezpur.

4.4 INSPECTION AUTHORITY

Officer deputed by Director, NERIWALM.

4.5 VALIDITY OF PERFORMANCE SECURITY

Successful bidder is required to submit Performance Security for a value of 5 % of value of PO/WO with validity up to contract period. Performance Bank Guarantee has to be submitted within 15 days from date of issue of PO/WO in the prescribed format issued by a scheduled bank from its branch in Tezpur/Guwahati.

4.6 PRE-BID INSPECTION / SURVEY

4.6.1 The bidder have to inspect the conditions of the auditorium before submission of their bid.

4.7 SCOPE OF WORK :

4.7.1 The scope of work as given in the BOQ including its operation and maintenance during warranty period of Visual Display and Associated Control Systems, Exterior Water Fountain, Outside lighting system, etc

4.8.2 Scope of work also includes liaison with the manufacturer of the equipments to be fitted in the auditorium and cafeteria regarding technical know-how of the equipments mentioned in the BOQ.

4.8.3 The work shall be generally carried out as per CPWD/APWD specifications as well as the specifications given in the tender documents. Specific instructions as may be issued by the Engineer-in-charge of NERIWALM responsible for work from time to time.

4.9. COMPLETION TIME

04(four) months from the date of signing of the agreement.

4.10 DAMAGE CAUSED TO INSTALLATION

In case of any damage caused to the installation due to negligence, carelessness or inefficiency of staff of the contractor/firm, the contractor/firm shall be responsible to make good the loss. Decision of the Director, NERIWALM shall be final & binding on the contractor.

4.11 DEPLOYMENT OF STAFF

4.11.1 The contractor shall depute a Technical person and other manpower for the site, who will coordinate the work execution activities and interact with the NERIWALM Engineer-in-charge responsible for supervision of the work.

4.15 SCHDULE OF MAINTENANCE

Within the one week of award of work, the contractor shall submit for approval of NERIWALM enclosing the detailed schedule of operation along with BAR CHART for smooth execution of the work. The monthly activities of works executed as per BAR CHART should be submitted to NERIWALM.

4.16 RECORDS TO BE MAINTAINED AT SITE

The following Register shall be maintained by the contractor/firm at site and to be got signed by Engineer in charge, NERIWALM.

- Site Order Register.
- Inspection Register.

4.17 PERSONAL ACCIDENT INSURRANCE:

The entire contractor/firm's employee will have to be covered under insurance against any personal accident and NERIWALM will not be liable for payment of any compensation on that account. During the execution of work, the contactor/firm shall follow all standard norms of safety measures / precautions to avoid the accident / damages to man, machineries and building. On non-adherence of this clause, suitable fines shall be imposed as decided by NERIWALM.

4.18 SPECIAL TERMS & CONDITIONS :

1) The bidders should quote for all categories of items described in the tender, partial bids will not be considered.
2) Notwithstanding anything else contained to the contrary in this Tender Document, **NERIWALM**, Tezpur reserves the right to cancel/withdraw/ modify fully or partially the 'Invitation for Bids' or to reject one or more of the bids without assigning any reason and shall bear no liability whatsoever consequent upon such a decision.
3) A Bidder should be manufacturer (OEM) or authorized distributor/channel partner/dealer/System

integrator of the Video Wall & Controller systems, Digital Podium, Audio Video Recording systems. In case the OEM is not quoting directly then the bidder should be an authorized distributor/channel partner/System integrator/authorized dealer of OEM, who is most suitable to implement & support the equipments.

4) MAF is mandatory to be submitted along with bid from OEM for Video Wall & Controller, Digital Podium, Audio Video Recording systems or the tender will be considered incomplete and summarily rejected.
5) The tender will be awarded to the lowest bidder subject that the bidder has adhered to all the technical specification as mentioned in this document.
6) The Bidder will have to submit hard copies of all Datasheet and Catalogs of the products quoted at NERIWALM office so that products quoted can be compared with the technical specifications.
7) The Bidder will also have to submit hardcopies of the tender papers with the exception of Price Bid file at NERIWAM Office
8) A consortium of bidders is allowed to be formed for the tender. Required documentation proving the consortium is legal as per law will have to submitted along with the tender.
9) The Bidder shall visit and study the site on their own cost with prior permission from the NERIWALM.
10) Bidder should be in business for a minimum period of 3(three) years out of which at-least 2(two) years in the North East India and should have a functional office either in Guwahati or Tezpur. Relevant Govt documentation like trade license/labour license etc has to be provided.
11) Technical Compliance Sheet of items (where applicable) will have to be submitted along with the technical bid. Tenderers not submitting this report will be summarily be rejected.
12) Bidders will have to supply the products as per the approved brand as mentioned in Tender document.
13) Bidders will have to submit an unpriced BOQ (Annexure I) of the supply items mentioning the Make and Model of the quoted products along with the Technical Bid. Tenderers not submitting this report will be summarily be rejected.
14) The tenders will be liable to be rejected if:

    a. If the tenderer does not quote for any item/sub item in the tender.
    b. If the tenderer propose any alteration to any of the conditions laid down.
    c. If the tenderer proposes any other conditions of any description whatsoever.
    d. If the tenderer does not comply with above special terms and conditions

It is reiterated that NERIWALM's decision regarding Bidder's eligibility will be final.

SECTION – 5

FORMAT OF PERFORMANCE BANK GUARANTEE (PBG)

North Eastern Regional Institute of Water and Land Management (NERIWALM)

Dolabari, P.O.: Kaliabhomora, Tezpur – 784027 (Assam)

(With due stamp duty if applicable)

OUR LETTER OF GUARANTEE No. : _____

In consideration of North Eastern Regional Institute of Water and Land Management (NERIWALM) Dolabari, P.O.: Kaliabhomora, Tezpur – 784027 (Assam) having its office at Tezpur (hereinafter referred to as "NERIWALM" which expression shall unless repugnant to the content or meaning thereof include all its successors, administrators and executors) and having entered into an agreement dated _____/issued Purchase Order No. _____ dated _____ with/on M/s _____ (hereinafter referred to as "The Contractor/Firm" which expression unless repugnant to the content or meaning thereof, shall include all the successors, administrators, and executors).
WHEREAS the Supplier having unequivocably accepted to supply the materials as per terms and conditions given in the Agreement dated _____ /Purchase Order No. _____ dated _____ and NERIWALM having agreed that the Contractor/Firm shall furnish to NERIWALM a Performance Guarantee for the faithful performance of the entire contract, to the extent of 10% (ten percent) of the value of the Purchase Order i.e. for _____.

We, _____ ("The Bank") which shall include OUR successors, administrators and executors herewith establish an irrevocable Letter of Guarantee No. _____ in your favour for account of _____ (Contractor/Firm) in cover of performance guarantee in accordance with the terms and conditions of the Agreement/Purchase Order/Work Order.

Hereby, we undertake to pay upto but not exceeding _____ (say) _____

_____ only) upon receipt by us of your first written demand accompanied by your declaration stating that the amount claimed is due by reason of the Contractor/Firm having failed to perform the Agreement and despite any contestation on the part of above named supplier.

This Letter of Guarantee will expire on _____ including 30 days of claim period and any claims made hereunder must be received by us on or before expiry date after which date this Letter of Guarantee will become of no effect whatsoever whether returned to us or not. _____

Authorized Signature

Manager

Seal of Bank

SECTION-6

BID SUBMISSION FORM

Offer No.: _____ Date: _____

To

The Director,

North Eastern Regional Institute of Water and Land Management (NERIWALM)

Dolabari, P.O.: Kaliabhomora

Tezpur – 784027 (Assam)

Dear Sir,

In response to your **Tender No. ……..……..Dated: …….for Supply, Installation and Commissioning of Visual Display and Control Systems, Exterior Development including Cafeteria and Parking**, Roofing and Associated Civil and Electrical Works of Auditorium at NERIWALM, Dolabari, Tezpur, Assam we hereby submit our offer herewith.

1. Bidder Name : _____

2. Email Address : _____

3. Address for Communication : _____

_____

_____

4. Telephone Number : _____

5. Authorised Person - Name : _____

Designation : _____

Mobile No. : _____

Email ID : _____

6. Alternate Person - Name : _____

Designation : _____

Mobile No. : _____

Email ID : _____

7. PAN Number : _____

8. GST Regn. No. : _____

9. Beneficiary's complete Bank Details in case payment through LC is approved.

Bank Account No. : _____

IFSC / NEFT Code : _____

Name of the Bank : _____

Address of the Branch : _____

10. Particulars of EMD

Amount : Rs. _____

Mode of Payment (DD/BG) : _____

DD/BG No. : _____

Date : _____

Name of the Bank : _____

Address of the Bank : _____

11. Particulars of Tender Fee

Amount : Rs._____

DD No. : _____

Date : _____

Name of the Bank : _____

Address of the Bank : _____

12. Turnover of the Bidder in last 3 years (Please submit copy of Annual Report)

Year Annual Report attached at

Page No.

Turnover in Rs. (Lakh)

2016-2017

2017-2018

2018-2019

Average Turnover

17. Details of similar work / order executed during last 3 years (Please submit copy of completion certificate from the client.

18. Are you a MSME Unit. If yes, please furnish Registration Details, Name of the DIC /State.

_____

_____

20. If you are MSME is it owned by SC/ST Entreneurs. If Yes, please specify the Name of the Owner who is SC or ST.

_____

21. Following Documents are submitted to substantiate other eligibility criteria.

i) _____

ii) _____

iii) _____

DECLARATION

1) We have read and understood the terms & conditions of the above mentioned tender and comply with all Terms & Conditions of your Tender.

(In case of any deviation the Bidder must attach a separate sheet clearly mentioning the Clause No. of the Tender and Deviation thereto)

2) We certify that the information mentioned above are true and correct to best of our knowledge.

3) In case of receipt of order we confirm that payment shall be received through e-Banking / Electronics Transfer.

4) This offer contains _____ No. of pages including all Annexures and Enclosures.

Place: Signature of Authorized Signatory

Date: Name:

Designation:

Seal:

SECTION 7

I. TECHNICAL SPECIFICATIONS OF VIDEO WALL DISPLAY AND CONTROL SYSTEMS

A. Technical Specification for 49” Video Wall Display

(Approved Makes: LG, BARCO, CRYSTE)

Sl No	Section	Item Description	Required Specification	Complied Yes/No
1	Eligibility	OEM must have own service centre in the state capital [Address to be attached] Only Certified by OEM / Authorised Partner can quote (MAF to be attached)		
2	Warranty	1 years		
3	Panel	Monitor Type	LED	
4		Panel Technology	IPS	
5		Monitor Size	49" diagonally	
6		Aspect Ratio	(16:9)	
7		Native Resolution	1,920 x 1,080 (Full HD)	
8		Brightness	500 cd/m2 or higher	
9		Contrast Ratio	1,400 : 1	
10		Dynamic CR	500,000 : 1 or higher	
11		Viewing Angle (H x V)	178 x 178 degree	
12		Surface treatment	Hard coating , Anti-glare treatment of the front polarizer	
13		Life Time [Typ]	60000 Hours	
14		Guaranteed Operating Hour	24 Hours	
15		Orientation	Portrait & Landscape both	
17	Connectivity	Inputs	HDMI, DVI-D, DP , OPS, Audio, RGB, USB 2.0 & USB 3.0	
18		Outputs	DP, Audio	
19		External Control	RS232C, RJ45, IR Receiver	
20	Physical Specification	Bezel Width	3.5 mm	
21		Slick Monitor Dimension (W x H x D)	1,211.4mm x 682.2mm x 86.5mm or 5% deviation allowed.	
22		Per Panel Weight (Head)	Not more than 20kg	
23	Environment Conditions	Operation Temperature	0 °C to 40 °C	
24		Operation Humidity	10 % to 90 %	
25	Power	Power Supply	100-240V~, 50/60Hz	
26		Power Consumption (Typ)	220W or less	
27		Smart Energy Saving	110W or more	
28	Industrial Grade Standard/Certification	Safety	UL / cUL / CB / TUV / KC	
29		EMC	FCC Class "A" / CE / KCC	
30		Energy Star	Energy Star 6.0	
31	Features	Up to 15x15 Tile Mode, USB Playback, Smart Energy Saving, Temp Sensor, Internal Memory, WiFi Dongle Ready.		

B. HD Base T Video Extender

(Approved Makes: LIGHTWARE/ EXTRON/ ATEN)

Sr No	Item Technical Specifications	Compliance (Yes/No)
1	It should Extends the distance between HDMI source and HDMI display	
2	It should Implements HD Base T - Lite extension technology using only one Cat 5 cable to connect the transmitter and receiver.	
3	It should be HDMI (3D, Deep Color, 4kx2k); HDCP Compatible.	
4	It should support Long distance transmission - up to 70m.	
5	It should Supports resolutions of up to Ultra HD 4kx2k and 1080p Full HD.	
6	It should selects the optimum EDID settings for smooth power-up and highest quality display.	
7	It should Supports up to 340MHz bandwidth for high performance video.	
8	It should Supports Dolby True HD and DTS HD Master Audio.	
9	It should have Max. Data Rate 10.2 Gbps (3.4 Gbps Per Lane).	
10	It should support Max. Resolutions / Distance Up to Up to 4K@35m (Cat 5e/6) / 40m (Cat 6a/Cat6); 1080p@60m (Cat 5e/6) / 70m (Cat 6a/ Cat6).	
11	It should support Operating Temperature 0 - 50°C.	
12	It should have support Temperature -20 - 60°C. & should have support 0 - 80% RH, Non-Condensing	

C. Lecture Capture and Record Streaming Device

(Approved makes: Media Pointe/Lumens/Sony)

Sr No	Item Technical Specifications	Compliance (Yes/No)
1	• Video Inputs Should be HDMI/ VGA/ RJ-45. • Max. Video-In Channels Should be Maximum 4 channel synchronized recording HDMI/ VGA/:2 channels,Full HD network camera:4 channels • Video-In Modes Should have HDMI: 480i~1080p/60fps,VGA Video 480i~1080p/60fps VGA PC 640*480~1920*1080 • Audio Inputs should have Line in, Mic. • Max. Audio In Channels should be 3.5mm Stereo: 2 channels • Video Processing Confirmation should have H.264/HC • Frame rate Should be Max. 30fps • Video Processing-Bit Rate Should be 64Kbps~24Mbps • Resolution Should be Max. 1080p • Audio-Processing Compression should be AAC-LC • Audio-Processing-Bit Rate Should be 32Kbps~512Kbps • External Storage Should be USB / eSATA • Internal Storage Built-in Should be 1TB hard disk (Only for VS-LC102) • Locally Stored File Output Format Should be MP4 • It should have Support Format Output :RTP, RTMP	

	• Streaming Format Should be Output : RTP, RTMP • Display Layout Should be Full screen/ picture-in-picture/ ,multi-channel split screen, up to nine layouts Recording LayoutMulti-View streaming, up to nine layouts. • It should be Index(Keyword Tagging) Automatic and manual index insertion • It should have Auto logo insertion during recording through web-based back stage management setting • It should have Share live vision station and Multicast • It should have webcasting Youtube Live, UStreaming, Adobe Media server • It should have Local File Playback. • It should have Select by Index, browse playable content through knowledge point index • It should have View course content on any device. • It should have Post lecturing device , through web-based back stage • It should have Post Index Points Editing, through web-based back stage to add and delete index points • It should have Auto Logo Title and Ending Insertion, through web-based back stage to insert logo title and endings when exporting lecture video • It should have Remote Control included with purchase • Power Supply should be 12V/ 2A • External Control should be supports RS-232 interface	

	port	

D. PTZ Camera for Recording

(Approved makes: Vaadio/Lumens/SONY)

Sr No	Item Technical Specifications		Compliance (Yes/No)
1.	Sensor	1/2.8" 2MP CMOS	
2.	Video Output	1080p-60/59.94/50fps, 1080i-60/59.94/50fps, 1080p-30/29.97/2fps, 720p -60 / 59.94 / 50 fps	
3.	Optical Zoom	20x	
4.	Panning Angle	-170° ~ +170°	
5.	Tilting Angle	-30° ~ +90°	
6.	Preset Positions	128	
7.	Video Output(HD) Interface	HDMI, 3G-SDI, Ethernet	
8.	Network Interface	RTSP Streaming / RTMP Streaming	
9.	PoE	PoE+ (IEEE802.3at)	
10.	Camera Control Interface/Protocol	RS-232 / RS-422 / Ethernet	
11.	Video S/N Ratio	> 50dB	
12.	Shutter Speed	1/1 ~ 1/10,000 sec	

13.	**Focal Length**	f = 4.7 ~ 94 mm	
14.	**3D NR**	Yes	
15.	**Horizontal Viewing Angle**	63°	
16.	**Aperture**	F1.6 ~ F3.5	
17.	**Minimum Illumination**	1.0 lux (F1.6, 50IRE, 30fps)	
18.	**Minimum Object Distance**	1.2m	
19.	**Gain Control**	Auto, Manual	
20.	**White Balance**	Auto, Indoor, Outdoor, One-Push, Manual	
21.	**Exposure Control**	Auto, Manual	
22.	**Focus System**	Auto, Manual	
23.	**Image Flip**	Yes	
24.	**Audio Input**	MIC / Line In	
25.	**Audio Output**	Ethernet, SDI and HDMI	
26.	**Video Compression**	MJPEG, H.264 / SVC	

E. 10 Mtr Cables

(Approved Makes: CRESTRON / EXTRON/ ATEN)

Sr No	Item Technical Specifications	Compliance (Yes/No)
1	It should support Superior video quality up to 4K (4096 x 2160 @30Hz)	
2	HDMI Ethernet Channel functionality: additional dedicated data channel supports networking	

3	HDMI (3D, Deep Color, 4K); HDCP 2.2 compliant	
4	It should have Gold-plated connectors for reliable transmissions & should be RoHS Compliant	
5	The Bend Radius should be 90 degrees or higher i.e Swings 100 times between angles of +/- 90 degrees, at a frequency of 13 times per minute or higher	
6	Length of the cable should be 10 mtrs	

F. <u>Audio De-Embedder with Repeater Function</u>

(Approved Makes: CRESTRON / EXTRON / ATEN)

Sr No	**Item Technical Specifications**	**Compliance (Yes/No)**
1	The device should be capable to repeat HDMI input signal up to 15 meters distance or higher	
2	It should have the capability to extract HDMI audio signal and outputs as additional audio source	
3	Should Support optical / coaxial digital audio and analog stereo audio	
4	The device should be HDCP 1.1 compatible or higher	
5	Superior Video Quality – up to 1920x1080 (1080p) should be supported	
6	Firmware upgradable feature should be there in case any new firmware is been made by respective OEM	
7	CH2/CH5.1/Auto mode audio channel selection feature us required to be there in the unit	
8	HDMI (3D) Support should be available	
9	Support for Dolby True HD and DTS HD Master Audio should be an integrated feature of the hardware	
10	It should have an Audio on/off switch for HDMI output	

11	It should provide expandability upto three levels of audio output for one HDMI at distance up to 45 m	
12	Integrates with Apple TV for the perfect home entertainment system	

G. Hardware Appliance based Video Wall Controller for 4 x 4 – 16 Panel Video Wall

(Approved Makes : 4THEWALL / ATEN / EXTRON)

Sr No	Item Technical Specifications	Compliance (Yes/No)
1	It should connects any of 16 HDMI sources to any of to 16 HDMI displays	
2	It should have Multiple Control Methods like front-panel pushbuttons, RS-232 control, and Ethernet connections for web-based GUI or Telnet	
3	It should have close-to-zero second switching for continuous video streams, real-time switching, and stable signal transmissions	
4	It should have video scaling function to convert input resolutions to the optimum display resolutions	
5	It should allows you to create custom video wall layouts via intuitive web GUI	
6	It should selects optimum EDID settings for smooth power-up, high-quality display, and use of the best resolution across different screens	
7	It should prevents image tearing by synchronizing the scaler output frame rate to the input signal frame rate	
8	It should have superior video quality – HDTV resolution of 480p, 720p, 1080i and 1080p (1920 x 1080)	
9	It should be HDMI (3D, Deep color); HDCP 1.4 compatible with support for Consumer Electronics Control (CEC) support	
10	It should have Local HDMI output which allows multiple preview of 16 video sources	
11	It should be Audio-enabled i.e. HDMI audio can be extracted to stereo audio	
12	It should supports Dolby True HD and DTS HD Master audio	

13	It should have ESD protection for HDMI	
14	It should maximum input distance up to 5 mtr & Output Distance of 15 mtr on HDMI Cable without usage of extenders	
15	It should have Maximum Data Rate 6.75 Gbps with Maximum Pixel Clock 225 MHz	
16	It should have operating temperature 0-40°C & storage temperature -20 - 60°C	
17	It should have humidity 0 - 80% RH, Non-Condensing	

H. DIGITAL PODIUM

SL	TECHNICAL SPECIFICATIONS		COMPLIANCE YES/NO
1	Type/Mounting	Free Standing	
2	Construction	The podium shall be wheel mounted capable of moving in all directions with a facility of lock them while the Electronic podium is in use. The enclosure shall be made of Polymer Powder Coated Steel Body with wooden top panels, designed to work in suitable environmental conditions. The wooden top shall have lock and key and should have a sliding cover for opening/closing easily. The Podium should have housing and connectivity for Visual Presenter while the visualiser is in use and not in use.At the time of using the Visualiser ,drawer can be opened and Visualiser can be used. The construction of the podium should be such that,while the podium is locked and not is use, there should not be any port exposed/ visible on the outer body for breakage/mishandling.	
3	Display	Built-in highly sensitive Interactive Panel with adjustable tilt (power driven motorized system) & a mechanism to make the Panel stable so that it does not shake while writing with following minimum features -	

(a)	Screen Type	LED	
(b)	Size	54.61 cm (21.5 inches)	
(c)	Resolution	1920 x 1080 or higher	
(d)	Aspect ratio	16:9/16:10	
(e)	Computer interface	One USB, One VGA/DVI/HDMI Port	
(f)	Interactive Resolution	4000 Lpi (lines per inch)	
(g)	Response Time	5ms	
(h)	Viewing Angles	170(H) ; 160(V)	
(i)	Touch	Finger and Stylus	
(j)	Reading accuracy	±0.5 mm (center)	
(k)	Tracking speed	Approximately 200 points per second	
(l)	Pen Pressure sensitivity	2048 Levels	
(m)	Speakers	Display panel should have Inbuilt Speaker	
(n)	Annotation software	Annotation software shall include features like draw,choose, pens, annotate, erase, color, shapes, sizes, text, edit, fonts, stamp, move, capture picture, video, save, rotate, undo, image gallery, print, floating keyboard and background etc.	
4	System Details		
(a)	Processor	Intel Core i 3, 3.1 Ghz	
(b)	Industrial Grade Chasis	Small form factor chasis in mini form factor for operation in suitable temperature environments.	
(c)	Chipset	Suitable chipset for the processor.	
(d)	Memory	4 GB or higher	
(e)	HDD/Storage	1TB	
(f)	Expansion I/O	2 USB, LAN 10/100	

(g)	Audio	1 x Line-out/1 Line-in	
(h)	Operating System	Windows 10 pre loaded	
(i)	Antivirus	Mcafee or equivalent with 1 year license	
(j)	In-Built Wi-Fi / Wireless LAN Card	Should have a inbulit Wi-Fi / Wireless LAN Card	
(k)	Dipslay Ports	VGA & HDMI	
5	Console Panel Ports accessible from outer body of Podium.		
(a)	RGB Input	1 x HDMI & VGA Input (other than the input of the PC in the podium to facilitate extra PC / Laptop etc.)	
(b)	USB Input	USB Port on the panel to facilitate inputs directly from Pen Drives / USB based hard disk Drive etc.	
(c)	LAN Connection	RJ 45 LAN Port at the panel to connect network	
(d)	Display	Selection switch to toggle between various sources for the output on the projection screen through a touch panel.	
6	Built in devices	Built-in devices on the Panel with easy access and control consisting of:	
(a)	Gooseneck Microphone	Gooseneck Microphone with XLR output.It should be Phantom powered so that there is no requirement of batteries thereby eliminating consumable cost.The gooseneck length should be atleast 21.5cm with ON/OFF switch and with LED light indicating ON/OFF status.The gooseneck microphone shall be permanently polarised condensor,highly directional featuring hypercardioid /lobar directivity.	
(b)	Wireless Microphone Units	The podium shall have a Reciver with a range of 15 mtr & shall come with 1 Handheld Mic, One Collar mic and one Head set microphone.	
(c)	Built in Amplifier		
	Power	200Watts RMS Amplifier	

(d)	Speakers	Four speakers of Minimum 50 W each shall be a part of standard supply.	
(e)	Central Controller with Panel	The podium shall have a controller with minimum 2 VGA inputs, 2 Audio Inputs, 2 Video inputs and required outputs to exploit all the funtionality of the podium and a built in Video Scalar feature.	
7	Sliding Trays	Provision for keeping laptop and Keyboard & Mouse	
8	Locking Mechanism	All the locks (3/4) fitted in the powder coated steel body should have a single key. Different podiums key should not be interoperable.	
9	Power Supply	100 -240V, 50Hz, AC Supply	
10	Security	Integrated authentication System having RFID, Password protection & Physical Key for secure access to system.	
11	Fans	Suitable cooling fans to be provided in the lower body.	

II. STAGE CURTAINS

A. MAIN CURTAIN

Technical Specifications: Curtain made out of velvet cloth with horizontal motorised sliding arrangement complete with fixing of railing track, fixing brackets, runner, muster runner, 3mm steel wire, 1 HP Motor Drum with groove cutting, pulleys, Air Breaker switch for reverse and forward, air micro switch for auto stop, push button for open/stop/close position. The curtain minimum overlap should be 900mm and the curtain should be stitched in double gathering.

Approve Brand for Curtain Motor: NEC/Crompton/Kirloskar

Approve Brand for Air Breaker Switch: (L&T or Seimens)

B. STAGE FRILLS

Technical Specifications: Stage frills made out from thick black cloth suspended from overhead with 42mm dia MS pipe with accessories like steel rope , clamp etc

C. STAGE SCALLOP

Technical Specifications: Ornamental scallop made of velvet cloth to be fixed in front of main curtain (40" long and 3" Wide) and on both side there will be hanging portion of approx. 5'5" to 6'5" long with necessary accessories with required gathering complete with trussels etc

III. FURNITURE

A. (Auditorium Lobby)

Approve Make: Wipro, Geeken, Godrej

Technical Specifications:

ITEM	TECHNICAL SPECIFICATIONS	COMPLIANCE (Y/N)
Premium quality Sofa for Auditorium Lobby Area.	1 Seater Sofa With Wooden Frame SS Pipe Legs Frame Seat Back Leatherite Tapestry Size In MM 860(L) 770(D) 780(H)	
Premium quality Sofa for Auditorium Lobby Area.	3 Seater Sofa With Wooden Frame SS Pipe Legs Frame Seat Back Leatherite Tapestry Size In MM 1860(L) 770(D) 780(H)	
Premium quality CAFE TABLES for Auditorium Lobby area.	TYPE/MECHANISM: Chrome Plated Cafe Table Pipe Frame Glass Top Size-900mm (Diameter)	

B. FURNITURE (Auditorium VIP Room)

Approve Make: Wipro, Geeken, Godrej

ITEM	TECHNICAL SPECIFICATIONS	COMPLIANCE (Y/N)
Premium quality Sofa for Auditorium VIP Room.	1 Seater Sofa with Wooden Frame SS Leg PLPB Side with SS Pipe Frame Leathrite Tapestry Size in MM : 880 (L) x 790 (D) x 660 (H)	
Premium quality Sofa for Auditorium VIP Room.	3 Seater Sofa with Wooden Frame SS Leg PLPB Side with SS Pipe Frame Leathrite Tapestry Size in MM : 1930 (L) x 790 (D) x 660 (H)	
Premium quality Centre Table for VIP ROOM.	SIZE/ MECHANISM: 1400 x 720/650 x 650 Centre Table SS Pipe Frame Chrome Finish Top PLPB 30mm Thick Lower PLPB 18mm Thick	

C. FURNITURE (Cafetaria)

Approve Make: Wipro, Geeken, Godrej

ITEM	TECHNICAL SPECIFICATIONS	COMPLIANCE (Y/N)
Premium quality CAFE TABLE for Cafeteria	TYPE/MECHANISM: Chrome Plated Cafe Table Pipe Frame Glass Top Size-900mm (Diameter)	
Premium quality CAFE STOOLS/CHAIR for Cafeteria	TYPE/MECHANISM: Chrome Plated Cafe Table Pipe Frame Glass Top Size-900mm (Diameter)	

D. FURNITURE (Dressing Room)

Approve Make: Wipro, Geeken, Godrej

ITEM	TECHNICAL SPECIFICATIONS	COMPLIANCE (Y/N)
Premium quality chair for Dressing room	TYPE/MECHANISM: Chrome Plated/Powder Coated Café Chair Pipe Frame PP Seat Shell	
Premium STEEL PERSONAL LOCKER	STEEL PERSONAL LOCKER-6 doors.w 900*450D*1830mm, guage-8mm,pc colour-60 micron, bifma standard 3, certified.	

IV. <u>CIVIL WORKS (Technical Specifications)</u>

All the materials to be used in construction work, equipment and fixtures to be supplied shall be approved by the Department, Project Engineer in charge or his authorized representative before utilization in the work.

Specification for all items of works should be as per approved Bill of Quantities for the work.

SL NO	DESCRIPTION / SCOPE OF WORK
1	BRICK WORK :
	General : Bricks shall be best quality locally available of uniform deep red colour, regular in shape and size and shall have rectangular faces with sharp corners. The brick work shall conform to IS:2212-1993. Bricks : Common burnt clay bricks shall be hand moulded or machine moulded. These shall be provided with frog. Bricks made by extrusion process and brick tiles may not be provided with frogs. Each brick shall be marked (in the frog where provided) with the manufacturer's identification mark. The brick shall be of uniform size and best quality locally available. The Engineer may at his descrition get sample of bricks tested for acceptance. The tests shal be as per Standard Practice for the following - a) Water absorption. b) Dimension tolerance. c) Efflorescence. d) Compressive strength. SOAKING OF BRICKS : Bricks shall be soaked in water for a period of 4 to 6 hours before use in works. LAYING: Bricks shall be laid in English Bond unless otherwise specified. For brick work in half brick walls, bricks shall be laid in stretcher bond. Half or cut bricks shall not be used except as closer where necessary to complete the bond closers in such cases, shall be cut to the required size and used near the ends of the walls. Header bond shall be used preferably in all courses in curved plan for ensuring better alignment. In case of walls one brick thick and under, one face shall be kept even and in proper plane, while the other face may be slightly rough. In case of walls more than one brick thick, both the faces shall be kept even and in proper plane. JOINTS: The mortar joints shall be of 10mm thick and shall be uniform.

	FINISHING OF JOINTS :The face of brick work shall be finished flush. The face joints of the mortar shall be worked out while still green to give a finished surface flush with the face of the brick work. CURING : The brick work shall be constantly kept moist on all faces for a minimum period of seven days. MEASUREMENTS : Brick work shall be measured in cubic metres unless otherwise specified and as given in the items of schedule of rates. Walls of half brick thick or less shall be measured in square meters. BRICK FLAT SOLING : For soling the bricks shall be picked slightly overburnt of approved brand, sound, hard, durable, dense, clean, free from soft spots, cracks, decay and other defects. Brick Bat shall not be used. All the fillings shall be watered and compacted to get maximum consolidation. All necessary trimming or filling for laying of the soling in line and required grade shall be done. The sub-grade shall be marked by stacks and strings for required depth for laying of soling. The cushioning as well as filling of joints shall be done with local sand. The bricks shall be laid on flat (unless otherwise specified) touching each other. Brick shall be laid in parallel rows breaking bond or in herring bond pattern as directed by the representative of Employer/Consultant and firmly embedded true to line and filled with local sand. MEASUREMENTS : The length and breadth shall be measured correct to a cm. Area shall be calculated in square metres correct to two places of decimal.
2	WOOD WORKS
	2.1 :DOOR, WINDOW AND VENTILATOR FRAMES : Timber for door, window and ventilators frames shall be as specified. Frames shall have smooth, well - planed (wrought) surfaces except the surfaces touching the walls lintels, still etc. which may be left clean sawn. JOINTS :The joints shall be at right angles when checked from the inside surfaces of the respective members. The joints shall be pressed in position. Each assembled door frame shall be fitted with a temporary stretcher and a temporary diagonal brace on the rebated faces. The joints shall be made as per local standard practice of timber jointing. FIXING OF FRAMES :The frames shall be got inspected and approved by the Engineer before being painted, oiled or otherwise treated and before fixing in position. The surface of the frames abutting masonry or concrete and the portions of the frames embedded in floors shall be given a coating of coal tar. Frames shall be fixed to the abutting masonry or concrete with holdfasts or metallic fasteners as specified. MEASUREMENTS : Wood work wrought, framed and fixed shall be measured for finished dimension without any allowance for the wastage or for dimensions beyond specified dimension without any allowance for the wastage or for dimensions beyond specified dimensions.

	2.2 : FLUSH DOOR SHUTTERS : Flush door shutters of specified thickness shall have a solid core and may be of the decorative or non decorative (Paintable type as per IS:2202 (Part-I)-1991. Width and height of the shutters shall be as shown in the drawings or as indicated by the Engineer. All four edges of the shutters shall be square. The shutter shall be free from twist or warp in its plane. The moisture content in timbers used in the manufacture of flush door shutters shall be not more than 12 percent when tested according to IS:1708-1986. The flush door shall be obtained from approved factory supported by adequate Test Certificates.
3	PVC, uPVC, FRP DOORS & DOOR FRAMES
	3.1: FIXED WINDOWS: Supplying and installing uPVC- Fixed Windows made out of Lead free green profile having "GREENLINE" mark of BIS standard uPVC multichambered sections of wall thickness 2.4mm with corners fusion welded, fully reinforced with galvanized steel 1.5/2mm including glazing bead , grooving bead, drain cap, fisher screws, packing pieces, necessary stainless steel screws etc. complete as directed. The windows must be installed complete with all kinds of ironmongery including EPDM gaskets, bridging wedges and glass packers and with suitable water draining system. Application of Silicon sealant from inside / outside of dowcorning / GE or equivalent.With 5mm clear glass. 3.2 : SLIDING WINDOWS : Supplying and installing uPVC- Sliding Windows made out of Lead free green profile having "GREENLINE" mark of BIS standard uPVC multichambered sections of wall thickness 2.4mm with corners fusion welded, fully reinforced with Galvanized steel 1.5/2mm including interlock profile, glazing bead, grooving bead, brush seal, aluminum sliding track, stainless steel rollers, sealing wedge block, Espag, int handle, pop up handle, keeper, drain cap, fisher screws, packing pieces with all necessary stainlessness screws etc. complete as directed. The windows must be installed complete with all kinds of ironmongery including EPDM gaskets, bridging wedges and glass packers and with suitable water draining system. Application of silicon sealant from inside / outside of Dowcorning / GE or equivalent.With 5mm clear glass. 3.3: SLIDING DOOR : Supplying and installing uPVC- sliding door made out of Lead free green profile having "GREENLINE" mark of BIS standard uPVC multichambered sections of wall thickness 2.8mm with corners fusion welded, fully reinforced with Galvanized steel 2mm including interlock profile, glazing bead, grooving bead, brush seal, locking arrangement, aluminum sliding track, stainless steel rollers, sealing wedge block, Espag, int handle, pop up handle, keeper, drain cap, fisher screws, packing pieces with all necessary stainlessness screws etc. complete as directed. The windows must be installed complete with all kinds of ironmongery including EPDM gaskets, bridging wedges and glass packers and with suitable water draining system. Fittings

	ROTO / GQ or Equivalent. Application of silicon sealant from inside / outside of Dowcorning / GE or equivalent.
4	STEEL WORKS
	The contractor shall provide all materials, labor and equipments including all other materials tools and plants and consumables required to complete the works in every respect inclusive of Temporary erection works. The contractor shall observe all safety measures for erection of structural steel work as covered in IS:7205. SHOP DRAWINGS: The contractor shall be supplied with profile drawings showing sizes of all structural members and typical connection details. The contractor shall be required to prepare wherever necessary, detailed shop drawings giving complete information necessary for fabrication of structures. Fabrication shall not commence until the approval of the relevant drawings has been obtained from the Engineer. However the contractor is not relieved of the responsibility for accuracy of detailed dimensions shown there on and also for the overall responsibility for the fabrication and erection of the structure. FABRICATION : The steel sections as specified shall be straightened and cut square to correct lengths. The cut ends exposed to view shall be finished smooth. No two pieces shall be welded or otherwise jointed to make up the required length of a member without proper and prior approval of the Engineer. Straightening, shaping to form the steel surfaces are to be painted with Red Oxide Zinc Chrome Primer conforming to IS2074 before placing in position. ERECTION : Steel work shall be hoisted and placed in position carefully without any damage, to the satisfaction of the Engineer. SEALING OF TUBES : When the end of a tube is not automatically sealed by virtue of its connection by welding to another member the end shall be properly and completely sealed, before sealing, the inside of the tubes should be dry and free from loose scale. 4.1: STEEL GRILL AND RAILINGS : The railings for gangway & spiral staircase shall be of mild steel. The design of railings and shape and sizes of various components shall be according to the drawings. The edge angles and corners shall be cleaned and true to shape. The joints, if possible, shall be mechanically interlocked and neatly spot welded in such a way that the grill is rigid. Grinding of

	the joints to achieve a neat regular finish shall be done. The grills shall be fixed to true plumb, line and level as per drawing. Railings etc. after being fixed in position shall be cleaned off dust, dirt, rust and loos scales before applying a coat of protective zinc chromate primer. 4.2:TUBULAR TRUSSES: Structural Steel Tube.:These shall be Conforming to the requirement of IS:1161-IS226. Tubes shall be designed by their nomnal bore. These shall be light, medium or heavy as specified depending upon the wall thickness having standard dimensions and weight as per IS. Welding : Where welding is adopted it shall be as per IS:816-1969. Caps and Bases for Columns : The ends of all the tubes, for columns transmitting loads through the ends, should be true and square to the axis of the tubes and should be provided with a cap or base accurately fitted to the end of the tube and screwed, welded or shrunk on. The cap or base plate should be true and square to the axis of the column. Flatened Ends : In tubular construction the ends of tubes may be flattened or otherwise formed to provide for welded, riveted or bolted connections provided that the methods adopted for such flattening do not injure the material. The change of sections shall be gradual. Hoisting and Erection : Tubular trusses shall be hoisted and erected in position carefully, without damage to themselves or other structure, equipment and injury to workman, as directed and to the satisfaction of Engineer. The method of hoisting and erection proposed to be adopted shall be got approved from the Engineer. The contractor shall however be fully responsible, for the work being carried out in a safe and proper manner without unduly stressing the various members. Measurements : The work as fixed in place shall be measured in running meters correct to a centimeter and their weights calculated on the basis of standard tables correct to the nearest kilogram unless otherwise specified. Weights of all other fixtures and bolt and nuts shall be added to the weight of respective items unless otherwise specified. No deduction shall be made for skew cuts.
5	FLOORING
	General: All flooring shall be laid to the best practice. The flooring shall be laid to the level except where slopes are called for on the drawings, in which case the slopes shall be uniform and arranged so as to drain into the indicated outlets. Particular care shall be taken to ensure that all the flooring, skirting and dados are perfectly matched for color and finish as approved. 5.1: Base Concrete : The base concrete shall be provided with the slope required for the flooring. Floors in verandah, courtyard kitchens, baths shall have slope ranging from 1:36 to 1:48 depending upon locations as decided by the Engineer. Floor in water closet portion shall have

slope of 1:30 or as decided by the Engineer to drain off washing water. Plinth masonry off-set shall be depressed so as to allow the base concrete to rest on it.

The flooring shall commence within 48 hours of the laying of base, failing which the surface of base shall be roughened with steel wire brushes without disturbing the concrete. Before laying the flooring the base shall be wetted and smeared with a coat of cement slurry at 2 kg. of cement spread over an area of one sqm so as to get a good bond between sub-grade and flooring.

Where base concrete is not provided, the earth below shall be properly slope, watered, rammed and consolidated. Before laying the flooring, it shall be moistened.

5.2: WHITE/COLOURED GLAZED TILES :

The tiles shall be of approved make and shall generally conform to IS:777:1988. They shall be flat, and true to shape and free from blishters crazing, chips, welts, crawling or other imperfections detracing from their appearance.

The tiles shall be square or rectangular of nominal size as specified in the drawing. The contractor shall get the tiles approved from the Engineer before laying.

The top surface of the tiles shall be glazed and glaze shall be either glossy or matt as specified. The underside of the tiles shall not have glazed or more than 5% of the area in order that the tile may adhere properly to the base, The edges of the tiles shall be preferably free from glaze. However, any glaze if unavoidable shall be permissible on only upto 50 percent of the surface area of the edges.

PREPARATION OF SURFACES AND LAYING :

Base concrete on which the tiles are to be laid shall be cleaned, wetted and mopped. The bedding for the tile shall be as specified. The average thickness of the bedding shall be minimum 10 mm while the thickness under any portion of the tiles shall not be less than 5 mm.

Mortar shall be spread, tamped and corrected to proper levels and allowed to harden sufficiently to offer a fairly rigid cushion for the tiles to be set and to enable the mason to place wooden plank across and squat on it.

Over this mortar beading neat grey cement slurry of honey like consistency shall be spread at the rate of 3.3 kg of cement per square metre over such an area as would accommodate about twenty tiles. Tiles shall be soaked in water washed clean and shall be fixed in this grout one after another, each tile gently being tapped with a wooden mallet till it is properly bedded and in level with the adjoining tiles. The joints shall be kept as thin as possible and in straight lines or to suit the required pattern.

The surface of the flooring during laying shall be frequently checked with a straight edge about 2 m. long, so as to obtain a true surface with the required slope.

Where full size tiles cannot be fixed these shall be cut (sawn) to the required size, and their edge

	rubbed smooth to ensure straight and true joints. Tiles which are fixed in the floor adjoining the wall shall enter not less than 10 mm under the plaster, skirting or dado. After tiles have been laid surplus cement slurry shall be cleaned off. POINTING AND FINISHING : The joints shall be cleaned off the grey cement slurry with wire /coir brush or trowel to a depth of 2mm to 3 mm and all dust and loose mortar removed. Joints shall then be flush pointed with white cement added with pigment if required to match the colour of tiles. The floor shall then be kept wet for 7 days. After curing, the surface shall be washed and finished clean. The finished floor shall not sound hollow when tapped with a wooden mallet. GLAZED TILES IN SKIRTING AND DADO : The tiles shall be as per drawing and as specified in the drawing. The contractor shall get the tiles approved from the Engineer before laying. PREPARATION OF SURFACES : The joints shall be raked out to a depth of atleast 15 mm in masonry walls.In case of concrete walls, the surface shall be hacked and roughened with wire brushes. The surface shall be cleaned thoroughly, washed with water and kept wet before skirting is commenced. LAYING : 12 mm thick plaster of cement mortar 1;3 (1 cement : 3 coarse sand) mix or as specified shall be applied and allowed to harden. The plaster shall be roughened with wire brushes or by scratching diagonal at closed intervals. The tiles should be soaked in water, washed clean, and a coat of cement slurry applied liberally at the back of tiles shall be tamped and corrected to proper plane and lines. The tiles shall be set in the required pattern and jointed. The joints shall be as fine as possible. Top of skirting or dado shall be truly horizontal and joints truly vertical except where otherwise indicated. Skirting and dado shall rest on the top of the flooring. Where full size tiles cannot be fixed these shall be cut (sawn) to the required size and their edges rubbed smooth. CURING AND FINISHING : The joints shall be cleaned off the grey cement grout with wire/coir brush or trowel to a depth of 2mm to 3 mm and all dust and loose mortar removed. Joints shall then be flush, pointed with white cement added with pigments if required to match the colour of tiles. The work shall then be kept wet for 7 days. After curing, the surface shall be washed and finished clean. The finished work shall not sound hollow when tapped with a wooden mallet.

	5.3 INTER LOCKING CEMENT CONCRETE PAVEMENT IN ROAD,PARKING AREA ETC. CONCRETE PAVERS TILES : Providing polished tiles of approved quality, size, shape of specified thickness on pavers over a base of 100mm compacted sand gravel including cutting where necessary finished with flush pointing with Fix-A-Tile (Choksey / Sika / Pedelite / Rouf) /white cement slurry mixed with approved pigment to match shade of tiles complete at all levels as specified and directed. (Coloured pigment should be in conformity with colour of tiles and as approved and directed by the Department). INTER LOCKING CONCRETE BLOCK PAVEMENT : Providing and laying of inter locking concrete block pavement (ICBP) with cement concrete paver blocks as per IS 15658-2006 of thickness 80mm and 28 days compressive strength not less than 30 N/m over a layer of bedding sand of compacted thickness 30mm, laid either in stretcher/ running/ herringbone pattern of bonds as directed by the engineer and in proper level and grade and compacted with appropriate equipment such as plat vibrator along with spreading of a thin layer of joint filling sand to fill up the gaps between blocks including construction of edge restraint wherever required complete as per drawings and Technical specification clause 1504 of MORD.
6	ROOFING
	6.1: DISMANTLING: Dismantling all existing roof sheet including ridges, hips, valleys and gutters etc. and stacking the materials as directed by the department for all levels. Installation of new roofing sheets. 6.2 :PRE PAINTED GALVANIZED IRON ROOFING SHEETS : Providing Pre Painted Galvanized Iron Sheet Roofing (PPGI) of 0.50 mm thick at all levels including fitting and fixing with self drilling, self tapping screws complete. (Roof trusses, purlins etc. to be measured and paid separately.) JSW, TATA Blue scope/ Dyna roof / Durakolor /Wonder Roof or equivalent as directed by the Departement. Sheets shall be fixed to the purlins or other roof members such as hip or valley rafters etc. with galvanised J or L hook bolts and nuts, 8mm diameter, with bitumen and G.I. Limpet washers or with a limpet washer filled with white lead as directed by the Engineer. While J hooks are used for fixing sheets on angle iron purlins, and L hooks are used for fixing to R.S. joists, timber or precast concrete purlins. The length of the hook bolt shall be varied to suit the particular requirements. The bolts shall be sufficiently long so that after fixing they project above the top of the nuts by not less than 10mm the grip of J or L hook bolt on the side of the purlin shall not be less than 25 mm. There shall be a minimum of three hook bolts placed at the ridges of corrugations in each sheet on every purlin and their spacing shall not exceed 30 cm. coach screws shall not be used for fixing sheets to purlins.

	The galvanised coating on J or L hooks, and bolts shall be continuous and free from defects such as blisters, flux stains, drops, excessive projections or other imperfections which would impair serviceability. The j or L hooks, washers etc shall be got approved by the Contractor from the Engineer before fixing. FINISH : The roof when completed shall be true to lines, and slopes and shall be leak proof. RIDGES AND HIPS OF PRE PAINTED GALVANIZED IRON ROOFING SHEETS: RIDGES AND HIPS : Ridges and hips of (PPGI) roof shall be covered with ridge and hip sections of plain G.S. sheet with a minimum lap of 20 cm on neither side over the C.G.S. sheets. The end laps of the ridges and hips and between ridges and hips shall also be not less than 20 cm. The ridges and hips shall be of 60 cm overall width plain G.S. sheet, 0.6 mm or 0.8 mm thick as given in the description of the item and shall be properly bent in shape.
7	CEILING
	7.1: PARTICLE BOARD : The specifications for particle board shall be as given in the drawing and tendered item.Specs: 12 mm thick plain/ semi perforatedor with design ceiling tiles of BWP type phenol formaldehyde syntheticresin bonded pressed particle board conforming to IS:3087, finished witha coat of aluminium primer on both sides & edges, including two coats ofsynthetic enamel paint of approved quality on exposed face, fixed to a grid made out of anodisedaluminium (with 15 micron anodic coating) Tsections 35 x15x1.5 mm size main runners, cross runners 23.5x19x1.5mm fixed to main runners placed 600 mm centre to centre both ways soas to form a grid of 600 mm square. The frame work shall be suspendedfrom ceiling by level adjusting hangers of 6 mm dia M.S rod fixed to roof slab by means of ceiling cleats and dash fastener. The suspenders shall be placed 600 x 1200 mm centre to centre including fixing to the frame with C.P brass screws and applying a priming coat of zinc chromate yellow primer. 7.2 :FIBRE CEMENT LINING BOARD : Providing and fixing of non asbestos, non combustible green building fibre cement lining boards made by autoclaved technology. The 6mm boards are composed of recycled fibres and cement as raw materials which includes G.I. framework of 0.50mm thick CRP surface ribbed perimeter channels (having one flange of 20mm and another flange of 30mm and a web of 27mm) along the perimeter of ceiling, screw fixed to brick wall/partition with the help of nylon sleeves and screws, at 610mm centres. Then suspending G.I. CRP surface ribbed intermediate channels of size 45mm (with two flanges of 15mm each) from the soffit at 1220mm centres with G.I. steel CRP surface ribbed ceiling angle of width 25mmx10mm fixed to soffit with GI cleat and steel expansion fasteners. Then 0.50mm thick G.I. CRP surface ribbed Ceiling section of having web of 51.5mm and two flanges of 26mm each with lips of 10.5mm are then fixed to the intermediate channel with the help of connecting clip and in direction perpendicular to the intermediate channel at 457mm centres. Next one layer of 8mm thick plain lining cement fibre board is fixed to the G.I. ceiling sections using “type S” Self tapping 3.5 x 25mm corrosion resistant drywall screws spaced at 200mm centers on all joints and 300mm centers in the field of boards. Screw fixing is done

	mechanically. Finally, boards and screw heads are to be jointed and finished so as to have a flush look which includes filling tapered edge and square edges of board with SHERA flexible cement based joining compound and fibre tape (As per recommended practice of manufacturer). Finally one coat of the top coat to be applied on the entire surface to give a smooth one level finish. 7.3: POARCH CEILING :Providing, fittingof Alluminium Ceiling fixed on Existing Roof Truss fitted with fitting, complete in all respect as specified and directed by the Department.
8	FINISHING :
	CEMENT PLASTER : Preparation of Surface : The joints shall be raked out properly. Dust and loose mortar shall be brushed out. Efflorescence if any shall be removed by brushing and scrapping. The surface shall then be thoroughly washed with water, cleaned and kept wet before plastering is commenced. In case of concrete surface if a chemical retarder has been applied to the form work, the surface shall be roughened by wire brushing and all the resulting dust and loose particles cleaned off and care shall be taken that none of the retarders is left on the surface. Mortar: The mortar of the specified mix shall be used. Application of Plaster : Ceiling plaster shall be completed before commencement of wall plaster. Plastering shall be started from the top and worked down towards the floor. All putlog holes shall be properly filled in advance of the plastering as the scaffolding is being taken down. To ensure even thickness and a true surface. The surfaces of these gauging patches shall be truly in the plane of the finished plaster surface adequate gauging plaster patches are to fixed first as directed by the Engineer. The wall plastering shall then be taken up to bring the surface to smooth with specified thickness by using wooden straight edge as directed. Finally the surface shall be finished off true with trowel or wooden float according as a smooth or a sandy granular texture is required. Excessive troweling or over working the float shall be avoided. All corners, arrises, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chamfering corners, arrises, provision of grooves at junctions etc. where required shall be done without any extra payment. Such rounding, chamfering or grooving shall be carried out with proper templates or battens to the sizes required. When suspending work at the end of the day, the plaster shall be left, cut clean to line both

	horizontally and vertically. When recommencing the plastering, the edge of old work shall be scrapped cleaned before plaster is applied to the adjacent areas, to enable the two to properly joint together. Plastering work shall be closed at the end of the day on the body of wall and not nearer than 15 cm to any corners or arrises. It shall not be closed on the body of the features such as plaster bands and cornices, nor at the corners of arises. Horizontal joints in plaster work shall not also occur on parapet tops and copings as these invariably lead to leakages. No portion of the surface shall be left out initially to be patched up later on. CURING: Curing shall be started 24 hours after finishing the plaster. The plaster shall be kept wet for a period of seven days. PRECAUTION : Any cracks which appear in the surface and all portions which sound hollow when tapped, or are found to be soft or otherwise defective, shall be cut out in rectangular shape and redone as directed by the Engineer.
9	PAINT WORK
	PAINTING ON MASONRY WALL : Preparation of wall surface with necessary cleaning and washing, applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete. Wall painting with premium acrylic emulsion paint of interior grade, having VOC (Volatile Organic Compound) content less than 50 grams/ litre of approved brand and manufacture, including applying additional coats wherever required to achieve even shade and colour. PAINTING & PRIMING COAT ON WOOD, IRON SURFACES: Primer : The primer for wood work, iron work or plastered surface shall be as specified in the description of item. This shall be of approved brand as approved by the Engineer. Preparation of Surface : Wooden surface : The wood work to be painted shall be dry and free from moisture. The surface shall be thoroughly cleaned. All uneveness shall be rubbed down smooth with sand paper and shall be well dusted. Knots, if any shall be covered with preparation of red lead made by grinding red lead in water and mixing with strong glue sized and used hot. Appropriate filler material conforming to IS:345 with same shade as paint shall be used where specified. The surface treated for knotting shall be dry before paint is applied. After obtaining approval of Engineer for wood work, the priming coat shall be applied before the wood work is fixed in position. After the priming coat is applied, the holes and indentation on the surface shall be stopped with wood putty. Stopping shall not be done before the priming coat is applied as the

	wood will absorb the oil in stopping and the latter is therefore liable to crack. Iron & Steel Surface : All rust and scales shall be removed by scrapping or by brushing with steel wire brushes. Hard skin or oxide formed on the surface of wrought iron during rolling which becomes loose by rusting, shall be removed. All dust and dirt shall be thoroughly wiped away from the surface and the surface should be dry. PAINTING OF WOOD WORKS: Primer coat: priming coats with primer of approved brand and manufacture, having low VOC (Volatile Organic Compound) content. With ready mixed pink or grey primer on wood work (hard and soft wood) having VOC content less than 50 grams/ litre Paint coat: Enamel paint of approved brand and manufacture (Asian paint/berger paint / ICI paint / J & N/nerolac). To give an even shade including cleaning the surfaces of all dirt, dust and other foreign matter sand papering and stopping.Surfaces over 100mm in width or girth. General purpose (Asian paint/berger paint / ICI paint / J & N/nerolac). PAINTING OF IRON WORKS: Primer: priming coats with primer of approved brand and manufacture, having low VOC (Volatile Organic Compound) content. With ready mixed red oxide zinc chromatic on steel / iron works having VOC content less than 250 grams/ litre Paint coat: two coats (excluding priming coat) on new steeland other metal surface with enamel paint of approved brand and manufacture(Asian paint/berger paint / ICI paint / J & N/nerolac). To give an even shade including cleaning the surfaces of all dirt, dust and other foreign matter sand papering and stopping. Surfaces over 100mm in width or girth. General purpose (Asian paint/berger paint / ICI paint / J & N/nerolac).
10	REPAIR WORKS:
	Repair works of RCC, PCC, Masonry Works and Plastering where necessary.
11	FIRE FIGHTING
	DRY CHEMICAL POWDER Fire Extinguisher confirming to IS: 2171 with ISI mark and CO2 cartridge will be confirming to IS: 4947 with ISI mark, Powder will be confirming to IS: 4308 with ISI Mark (10 kg)
12	EXTERNAL WALL CLADDING
	Supply and Installation of MCM Modified Clay Material as per company standard dimension, pattern, color as specified, manufactured through unfired patended (Ref: US patent 8505840 B2 & European Patent 2157139) manufacturing technology, bonded together by using low heat temperature and having CE approval with the thermal conductivity of 0.0590 W/M.K — EN

	12667 (2001), thermal resistance of 0.0568 M2 K/W— EN 12667 (2001) and Fire Insulation - Class A— ASTM E84- 15. The product should be patented from United States and Europe and with certifications by IGBC, Singapore Green Label and China Green Building material. MCM Materials should be fixed with suitable Cement/ Polymer/Epoxy based adhesive as per adhesive chart and substrate and per directions of Engineer In-charge. Grouting should be done using filling and pointing method as per installation drawing provided, and colour of the grout should be as per the architects specification depending on the substrate and as per the direction of Engineer in-charge.
13	COMMERCIAL KITCHEN :
	Providing ,Installation of Commercial Kitchen as specified below : 1. SS Three burner Indian Range, 15" X 15" Square pan support, heavy duty round flame Indian burner with brass body pilot burner - 3 nos, 1.5" OD SS square pipe verticals with nylon height adjusters, 1" OD SS square pipe with cross bracing, 6" flashback SS, size: 72" x 24" x 34+6". 2. SS Single Sink, size: 24" x 24" x 34+6", 1.5" OD SS square pipe verticals with nylon height adjusters, 1" OD SS square pipe with cross bracing, 6" flashback SS. 3. SS Work Table with 2 u/s and 2 o/s, 1.5" OD SS square pipe verticals with nylon height adjusters, size: 43" x 24" x 34+24". 4. SS Wall Mounted Rack, 16 SWG thickness, 1.5" raised from three sides, front side open, size: 43" x 12". 5. SS four door chiller, 1100 litre capacity, brand ElanPro, Model no RI 1100 CF, size: 48" x 30" x 77", 6 adjustable shelves. 6. LPG pipeline with 4 connection manifold and 50 feet pipeline, with 2 nos of burner connections - Rs. 44,000/- (estimated). 7. GI Duct line and chimney with 11 feet chimney and 30 feet duct line, along with 18" Axial Flow Fan from Crompton Greaves.
14	STAGE MAIN CURTAIN :
	Supply, Installation and Commissioning of main curtain made out of velvet cloth with horizontal motorised sliding arrangement complete with fixing of railing track, fixing brackets, runner, muster runner,3mm steel wire, 1 HP NEC/Crompton/Kirloskar Motor Drum with groove cutting , pulleys, 2 Nos Air Breaker switch (L&T or Seimens) for reverse and forward , 2 nos air micro switch for auto stop , 3 nos push button for open/stop/close position. The curtain minimum overlap should be 900mm and the curtain should be stitched in double gathering.Supply, Installation of average frills made out from thick black cloth suspended from overhead with 42mm dia MS pipe with accessories like steel rope , clamp etc. Supply, fixing and fitting of ornamental scallop made of velvet cloth to be fixed in front of main curtain (40” long and 3” Wide) and on both side there will be hanging portion of approx. 5’5” to 6’5” long with

	necessary accessories with required gathering complete with trussels etc
15	FOUNTAIN
	Providing and installation of Water Fountain with all necessary Civil, Plumbing & Electrical works as per Architects Design & Specification. Supply, Installation, Testing & Commissioning of Geyser Jet Nozzles 1 I nch Body: Brass (Chrome plated), Submersible pump at flow rate LPM at the head of 10m ,HP – 5, Make – Crompton / Kirlosker / Leo, Necessary plumbing work such as CPVC pipes (Ashirwad / Ajoy) and suitable for the respective working pressure 6kg/cm2 / 10kg/cm2 with all fittings coupling, tees, bends, reducers, bushes, male & female thread adopters, screwed adaptors etc. jointing with solvent chemicals. Electrical Panel of cubical type wall/floor mounted, 16 guage weather proof powder coated double door body IP-65 for recirculation pump in coming MCB', Relay, Contactor, Ammeter, Voltmeter, Single phase priventer, push button, TPN MCB's, SP, MCB base, Farul, connector, indiating lights. Thimbols, wiring of panel etc. Accesories Make, Panel disctance at 10 mtr from the pool and light smps near about the water body, Installation, Testing & Commissioning of fountain .
16	SCAFFOLDING
	Scaffolding shall be strong to withstand all dead, live and impact loads which are likely to come on them.

LIST OF APPROVED MANUFACTURERS OF MATERIALS TO BE USED IN THE INTERIOR/ EXTERIOR WORKS SUBJECT TO THE APPROVAL OF SAMPLES BY THE OWNER.

1. Unless otherwise mentioned any one of the approved makes or brands shall be allowed to be used. Other specific equivalent brands with BIS mark may be allowed to be used if approved by OWNER.
2. The tenderer shall distinctly understand that it will not be their prerogative to insist on a particular brand from the list. Final selection will be done with the approval of OWNER.
3. Wherever contractor proposes to use equivalent makes (i.e. other than specified), the same shall be done after prior approval of the Owner. Any additional expenditure and time due to this shall be solely on contractor's account and no claims whatsoever shall be entertained in this regard.
4. If the schedule of quantities prescribes a particular brand of materials or fittings, the same shall be considered while quoting the rates.

1. CIVIL WORK	
MATERIAL	APPROVED MANUFACTURER/ BRAND
CEMENT	Ambuja / Dalmia / Star
WATER PROOFING CHEMICALS (CONCRETE / MORTAR ADMIXTURES).	Sika India Pvt. Ltd./ Choksey Chemicals Pvt. Ltd./ Cico Technologies Ltd./ Reliance Industries Ltd./ Insultech.
EXTERIOR WALL CLADDING.	SHERA/ PHOMI or similar equivalent.
REINFORCEMENT STEEL	JSW/TATA/SAIL/Esser Steel/ Jindal steel/Shyam steel
REINFORCEMENT STEEL for Drain, retaining wall & boundary wall etc.	SAI/BISCON/THERMAX/XTECH
STRUCTURAL STEEL & ROLLED STEEL SECTIONS	Dimension and specification of the steel members shall conform to IS 808 – 1989 and the dimension and cutting tolerances should conform as per IS 1852 – 1985.
VITRIFIED TILES (WALL & FLOOR TILES)	Johnson / Nitco / Kajaria / Orient / Somany
FLOAT GLASS & MIRROR	Saint Gobain / Asahi India / Modi Guardian Glass
WALL PUTTY	Birla white / JK White
PAINTS (OBD, EM ENAMEL PAINTS)	Asian paints / Berger
RED OXIDE & PINK PRIMERS	Asian / Berger/ Nerolac
FASTENERS/ANCHOR BLOTS FOR GANGWAY	Hilti
GYPSUM FALSE CEILING	Anutone, Saint-Gobain, Armstrong, Lafarge (LaGyp)
FIBRE CEMENT LINING BOARDS FALSE CEILING	SHERA or similar equivalent.
ROOFING	JSW/TATA / Dyna roof / Durakolor /Wonder Roof or equivalent as directed by the Departement.

UPVC DOOR/ WINDOWS	FENESTA or similar equivalent.
2. CARPENTRY / WOOD WORKS MATERIAL LIST:	
MATERIAL	APPROVED MANUFACTURER/ BRAND
WOOD	Sal wood
PLYWOOD	Duro/Greenply / Samrat / Century /Wudply
LAMINATES	Ventura/Greenlam/Century
VENEERS	Greenply / Duro / Euro / Durian/ Samrat/ Century.
BINDING MATERIALS	Fevicol / Pidilite / Approved Equivalent.
PAINTS	Nerolac / Asian / Berger/ Approved Equivalent
PRIMERS	ICI / Asian Paints / Wooderite
FURNITURES FITTINGS RES, TELESCOPIC SLIDES	Godrej, Dorma, Ozone
MODULAR FURNITURE	Geeken or equivalent as directed by the Department.
3. FIRE EXTINGUISHERS	
MATERIAL	APPROVED MANUFACTURER/ BRAND
EXTINGUISHER	Life Secure/ Rapid Fire / Minimax

V. ELECTRICAL WORKS

Technical Specifications:

PART 1 – GENERAL

1. STANDARDS :

660/1100 V grade PVC insulated / cables for working voltage upto and including 1100 volts IS 694 : 1990 MS conduits for electrical installation - General requirements	IS 9537 : Part I 1980
MS conduits for electrical installation – Rigid steel conduit	IS 9537 : Part II 1981
Accessories for rigid steel conduits for electrical wiring	IS 3837 : 1976
Fittings for rigid steel conduit for electrical wiring	IS 2667 : 1988
Flexible (pliable) nonmetallic conduit	IS 9537 (P-5) : 2000
Flexible steel conduits for electrical wiring	IS 3480 : 1966
Rigid nonmetallic conduit for electrical installations fittings for rigid non metallic conduit	IS 2509 : 1973
	IS 3419 : 1988
Interlocking switch socket outlets	IS 4160 : 1967
Switch socket outlets	IS 4615 : 1968
3 pin plugs and socket outlets upto 250 volts rated current upto 16 amps	IS 1293 : 1988
Conductors for insulated electric cable and flexible conduit	IS 8130 : 1984
General and safety requirements for luminaries Tubular fluorescent lamp	IS 1913 Part-I : 1978
Switches for domestic and similar purposes	IS 3854 : 1997
Danger notice plates	IS 2551 : 1982
Code of practice for electrical installation fire safety of buildings	IS 1646 : 1997
Code of practice for electrical wiring installations	IS 732 : 1989
General requirements for enclosures for accessories for house hold and similar fixed electrical installations	IS 14772 : 2000

Guide for marking insulated conductor	IS 5578 : 1985
Guide for uniform system of measuring and identification of conductors and apparatus terminals	IS 11353 : 1985
General and safety requirements for fans and regulators for house hold and similar purposes	IS 12155 : 1987
Guide for safety procedure and practices in electrical works : General	IS 5216 Part-I : 1982
Recommendation on safety procedure and practices in electrical works – life saving technique	IS 5216 Part-II : 1982

LT DISTRIBUTION BOARDS

Electrical accessories – circuit breaker for overcurrent protection for house hold and similar installations (Miniature Air Circuit Breakers for AC circuits)	IS 8828 : 1996 and IEC 947
Residual current operated Circuit Breakers	IS 12640 Part-I : 2000
Code of Practice for installation and maintenance of switchgear not exceeding 1000 volts	
• General	IS 10118 Part-I : 1982
• Selection	IS 10118 Part-II : 1982
• Installation	IS 10118 Part-III: 1982
General requirements for switchgear and control gear for voltages not exceeding 1000 volts AC or 1200 volt DC	IS 4237 : 1982 221

WORK DESCRIPTION

2. WIRING DEVICES :

i) The drawings for the lighting and power points indicate approximate positions of all lighting fittings, switches, power outlet points, isolating switch points and the like. The actual positions of all fittings, switches, the wiring details and cable routes shall be co-ordinated with other trades on site and submitted for the approval of the Engineer. All time and cost required adjusting the layout or adjusting the completed installation to Engineer satisfaction and to suit site co-ordination is included in the Contract.

ii) No additional cost will be entertained should the final positions be relocated within the same room or not more than five (5) metres away from the original locations due to any requirement.

iii) For the purpose of this Specification and related Drawings, each lighting and small power point circuits shall in general be coded with a prefix to indicate the corresponding distribution board number; details on the circuit way and phase shall be submitted for the approval of Engineer.

3. LIGHTING POINT INSTALLATION :

i. The drawings for the lighting and power points indicate approximate positions of all lighting fittings

ii. Surface mounted light fitting shall terminate at a junction box having entries appropriate to the run of conduit and shall be complete with porcelain/ PVC connector suitable for the size and number of connections to be made at the point and the wiring required to connect the specified fitting.

iii. At every light fitting an approved type earthing terminal shall be provided for connection of the circuit protective conductor of the final circuit.

iv. Cables used for internal wiring of the lighting fittings shall be of appropriate type and size and number. Conductor shall be of size not less than 1.5 sq.mm. single core or the equivalent. The insulation of the cables shall be able to withstand throughout the life of the fitting the maximum temperature to which it will be subject in normal use without deterioration which could affect the safety of the fitting

v. All lighting fittings and lamps shall be self-supporting complete with the appropriate fixing accessories such as clips, supporting brackets, suspension sets, nuts, washers, screws etc. for the proper installation of the fittings on different types of ceiling panels or walls.Suspension sets shall be of adjustable type suitable to carry the weight of the lighting fittings and unless otherwise stated or indicated on Drawings

vi. Lighting switches, unless otherwise specified, shall be single pole, quick make and slow-break, silent switch action type with solid silver alloy contacts and totally enclosed switch action for flush or surface mounting

vii. Switches for external use shall be of weatherproof construction with IP65 rating, unless otherwise specified.

viii. Samples of all switches, conduit boxes and plaster depth boxes shall be submitted to the Engineer for approval prior to installation

ix. Samples shall be rated for 6 Amps (minimum light switch rating 6A), 16 Amps or 20 Amps as determined by circuit load

x. An earthing terminal, connected to the earth continuity terminal shall be provided and connected to the circuit protective conductor at every lighting switch positions

xi. Switch socket outlets shall be as per BS1363 single pole 6 Amp 3 round pin shuttered outlets, one or two gang for indoor service except otherwise specified and either surface or flush mounting according to location.

xii. All switch socket outlets used shall be of an approved quality

xiii. 16 Amp switch socket outlets shall be 3 pin round type to BS 546 shuttered, of a finished similar to 6 Amp switch socket outlets and flush mounted in galvanised steel conduit boxes to BS 4662 requirements

xiv. The MCB shall be suitable for manual closing and opening and automatic tripping under overload and short circuit. The MCB shall also be trip free type.

xv. Single pole/three pole versions shall be furnished as required.

xvi. The MCB shall be rated for 10 KA fault level.
xvii. The MCB shall be suitable for its housing in the lighting boards and shall be suitable for connection at the outgoing side by tinned cable lugs and for bus-bars connection on the incoming side.
xviii. The terminal of the MCBs and the open and close conditions shall be clearly and indelibly marked.
xix. The MCB shall generally conform to IS: 8828
xx. Residual Current Circuit Breaker or RCCB shall be 2 pole 220 volts / 4 pole 415 volts 50Hz, 30-300mA sensitivity. These shall be of approved make. The rating of the RCCB shall be as required. These shall be suitable for manual closing and opening and automatic tripping under earth fault circuit of 30-300mA as specified in item of work.
xxi. The enclosure of the RCCB shall be moulded from high quality insulating material. The material shall be fire retardant, anti tracking, non-hygroscopic, impact resistant and shall with stand high temperature.
xxii. All parts of switching mechanism shall be non-greasing, self lubricating material so as to provide consistent and trouble free operation.
xxiii. Operation of RCCB shall be independent of mounting position and shall be trip free type.
xxiv. Distribution boards shall be of standard make with MCBs as per approved make given. Distribution boards shall be constructed out of steel sheet all weld enclosure.
xxv. Ample clearance between the conductors of opposite pole, between conductors and sheet steel body shall be maintained in order to obviate any chance of short circuit
xxvi. The MCBs shall be mounted on high grade rigid insulating support and connected by electrolytic copper bus bars.
xxvii. Each incoming MCB/Isolator shall be provided with solder-less cable sockets for crimping.
xxviii. Distribution boards shall be recessed in wall niche or if required mounted on the surface of the wall with necessary clamp bolts etc.

4. WIRES AND CABLES:

WORK DESCRIPTION

i. The design manufacture, testing and supply of single core PVC insulated 1.1 KV grade stranded twisted wires under this specifications shall comply with latest edition of following standards.
ii. IS-3961: Current rating for cables.
iii. IS-5831: PVC insulation and sheath of electric cables.
iv. IS-694: PVC insulated cables for working voltage up to and including 1100 volts.
v. IEC-54 (I): PVC insulated cable.
vi. Copper/Aluminium stranded twisted conductor PVC insulated wires shall be used in conduit as per item of work. Aluminium for power cables and copper for control cables shall be used.
vii. The wires shall be colour coded R Y B, for phases, Black for neutral and Green for earth.
viii. Progressive automatic in line indelible, legible and sequential marking of the length of cable in meters at every one-meter shall be provided on the outer sheath of cable.
ix. The design, manufacture, testing and supply of the cable under this specifications shall comply with latest edition of following standards:
x. IS: 8130: Conductors for insulated electric cables and flexible cords.

xi. IS: 5831: HRPVC/HR PVC insulation and LSZH sheath of electric cables.
xii. IS: 3975: Mild steel wires, strips and tapes for armouring cables.
xiii. IS: 3961: Current rating of cables.
xiv. The routing and the minimum rated current carrying capacity of the LV power cables shall be as indicated on the Drawings. The Contractor shall consider the manufacturer data and engineering the cable sizing to ensure it suit the conditions, viz grouping, ambient temperature etc., and for making any necessary adjustment to the Engineer's approval.
xv. All LV cables for normal power/control circuitries within buildings shall be copper conductor with XLPE insulated and PVC sheathed, denoted as XLPE/PVC cable or copper conductor with PVC insulated, denoted as PVC cable as specified.
xvi. All LV cables for emergency power circuitries serving emergency lightings, Building Management System (BMS), Fire Protection System, Security Systems, emergency communication systems, and sump pump system and fire lifts etc. with back-up from standby generator sets or UPS systems or incoming and outgoing from the Emergency Main Switchboard shall be fire resistant cables as required.
xvii. Cablings in service ducts, open trenches, direct-laid underground in soil shall be by means of armoured cables. Non-armoured cables shall be laid in conduits, trunkings or tray/ladder for mechanical protection.

SPECIFICATIONS :

i. LV CABLES
ii. The cables shall be suitable for laying in racks, ducts, trenches conduits and under-ground buried installation with uncontrolled back fill and chances of flooding by water.
iii. They shall be designed to withstand all mechanical, electrical and thermal stresses under steady state and transient operating condition.
iv. The aluminium/copper wires used for manufacturing the cables shall be true circular/sector in shape before stranding and shall be of uniformly good quality, free from defects. The conductor used in manufacture of the cable shall be of H2 grade.
v. The cable should withstand 2.5 KA for 1 Sec. with insulation armour insulated at one end. Bidder shall furnish calculation in support of capability to withstand the earth fault currents. The current carrying capacity of armour and screen (as applicable) shall not be less than the earth fault current values and duration.
vi. The fillers and inner sheath shall be of non-hygroscopic fire retardant materials and shall be suitable for the operating temperature of the cable. Filler and inner sheath shall not stick to insulation and outer sheath.
vii. Progressive automatic in line indelible, legible and sequential marking of the length of the cable in metres at every one metres shall be provided on the outer sheath of all cables and at every 5 metre 'LSZH marking in case of 'LSZH cables.
viii. Strip/Wire armouring following method (b) mentioned in IS: 3975 shall only be acceptable. For single core cable aluminium wire armouring shall be used.
ix. Allowable tolerance on the overall diameter of the cables shall be + 2mm.
x. The normal current rating of all HRPVC/XLPE insulated cables shall be as per IS: 3961.
xi. A distinct inner sheath shall be provided by pressure extrusion process for all multicore armoured and unarmoured cables as per IS: 5831.
xii. Outer sheath shall be provided by extrusion process as per IS: 5031.
xiii. The breaking load of armour joint shall not be less than 95% of that armour wire. Zinc rich paint shall be applied on armoured joint surface.

xiv. In plant repairs to the cables shall not be accepted.

xv. All the cables shall be supplied in non-returnable drums as per IS: 10418.

xvi. In Case of LSZH Cables

xvii. The outer sheath of cables shall have an oxygen index of not less than 29 as per ASIMD : 2863.

xviii. The maximum acid gas generation by weight as per IEC:754 (i) shall not be more than 20% for outer sheath material of all cables. Bidder shall also guarantee the maximum theoretical acid gas generation with 20% by weight of outer sheath.

xix. The cables outer sheath shall meet the requirement of light transmission of 40% (minimum and shall be tested as per ISTMD:2843). In case the test for light transmission is conducted as per ASTME:662. The bidder shall furnish smoke density values as per this standard and shall co-relate the anticipated light transmission when tested as per ASTMD:2843.

xx. The cable shall pass the fire resistance test as per SS:42, 41, 475 (I) and flammability test as per EEE:383.

4.1 Fire Seal System

A. . Cable shall be installed so that separations shown in the table below are observed.

1.	HV Cable (33 KV)	- HV Cable (33 KV)	50 mm
2.	ELV & LV 230 V/433 V	- ELV & LV cable 230 V/433 V	50 mm
3.	HV cables (33 KV)	- ELV & LV cables 230 V/433 V	300 mm
4.	LV cables 433 V	- Telephone/Instrument cable	350 mm
5.	All cables- All hot pipe work	200 mm	

5. PANEL BOARDS :

STANDARDS

All equipment, material and components shall comply with the requirements of the latest editions of Indian Standards with updated amendments. Standards and Regulations applicable in the area where equipment is to be installed shall also be followed.

The Panel boards shall be engineered and constructed in accordance with the latest revision of the following Indian and British standards:

IS 13947 : A.C. Circuit Breakers

IS 3427 : Metal enclosed Switchgear & Control Gear

BS 162 : Safety Clearances

IS 2705 : Current Transformers

IS 3156 : Voltage Transformers

IS 3202 : Code of Practice for climate proofing of electrical equipment

IS 375 : Marking & Arrangement for Switchgear Bus Bars, main connections and auxiliary wiring.

ARE 722 : A.C. Electric Meters

IS 1248 : Direct acting Electrical Indicating Instruments

IS 3231 : Electrical Relays for Power System Protection

IS 2544 : Epoxy Cast Resin Insulators

IS 5082 : Electrolytic Copper/ Aluminium

IS 5792 : High Voltage HRC fuses

BS 88 : Cartridge fuses for voltages up to and including 1000V AC and 1500V DC.

BS 89 : Direct acting electrical indicating analogue electrical measuring instruments and their accessories.

BS 142 : Electrical protective relays

BS 159 : Busbar and Busbar connection

BS 1433 : Copper for electrical purposes. Rods and bars.

BS EN 60898 : Circuit-breakers for over current protection for household and similar installations.

BS 3938 : Current transformers

BS EN 60947-2 : Low-voltage switchgear and control gear, Part 2 circuit-breakers.

BS 4794 : Control switches (switching devices, Part 1 including contactor relays, for control and auxiliary circuits, for voltages up to and including 1000V AC and 1200V DC). General requirements.

BS 5419 : Air-break switches, air-break disconnectors, and fuse combination units for voltages up to and including 1000V AC and 1200V DC.

BS 5420 : Degrees of protection of enclosures of switch Part I great Part I and control gear for voltages up to and including 1000V AC and 1200V DC.

BS 5424 : Control gear for voltages up to and including 1000V AC and 1200V DC – Part 1 Contactors.

BS 5486 : Low-voltage switchgear and control gear Part 1 assemblies. Part I: Requirement for type tested and partially type tested assemblies.

BS 5685 : Electricity meters – Part I: Class 0.5, 1 and 2 single phase and poly phase, single-rate and multi-rate watt-hour meters.

BS 5992 : Electrical relays

BS 6004 : PVC insulated cables, (nonarmoured), for electric power and lighting.

BS 6231 : PVC insulated cables for switchgear and control gear wiring.

IS 3043/ BS7430 : Earthing

BS/IEC or IS not mentioned above but are applicable to this

installation shall also apply.

WORK DESCRIPTION

i. This specification covers the 'General Requirements' for the design, manufacture, supply performance, inspection, testing and commissioning including supply of indoor type low voltage switch boards up to 1000 V including necessary termination, cabling and bus work required for satisfactory operation .
ii. The Panel boards included, distribution boards and control panels shall be built in accordance with IEC 439 "Factory Built Assemblies for Low Voltage" or BS 5486 "Factory-built Assemblies of Switchgear and Control Gear for Voltage up to and including 1000 AC and 1200V DC.
iii. All factory built assemblies subject to rain or wet conditions or located outside electrical switch room shall be weatherproof constructed to IP 65, able to withstand high impact strength of 60 KN/m2 (min.), temperature resistant, flame retardant and corrosion resistant.
iv. Specific requirements shall be in accordance with single line diagram/specification & BOQ.
v. The technical parameters of switchgear equipments, transformers etc. shall be referred.

SPECIFICATIONS :

i. The switch Panel boards shall be cubicle type, suitable for indoor installation, floor mounting and free standing. The design shall be totally enclosed, dust - tight, damp-proof and vermin proof offering degree of protection not less than IP-42.

ii. Separate segregated compartments shall be provided for circuit breakers, bus bars, cable box, voltage transformers, wire ways, relays, and

instrument and control devices. Switchgear cubicles/ modules shall be provided with hinged doors in front with facility for padlocking door handles.

iii. Vent openings shall be covered with grills so arranged that hot gases cannot be discharged through them in a manner that can injure the operating personnel. These vent openings shall be vermin proof.

iv. All panels shall be of same height, width and depth. Panels shall be bolted together to form a continuous flush front switch board, suitable for front of board operation.

v. The switchgear cubicles shall be rigid and robust in design and construction, fabricated out of CRCA sheet steel. Cubicles shall be made from rigid welded structural frames made of structural steel sections or of pressed/formed sheet steel of not less than 3mm thickness. The frames shall be enclosed by sheet steel of at least 2mm thickness, smoothly finished, leveled and free from flaws. Stiffeners shall be provided wherever necessary.

vi. All doors, panels, removable covers shall be provided with non deteriorating (neoprene) gaskets all around the perimeter.

vii. All doors shall be removable and supported by concealed type hinges. The hinges shall be strong and braced to ensure freedom from sagging, bending and general distortion of panel or hinged part.

viii. Floor mounted cubicles shall be provided with a 75mm high channel base frame. The total height of the cubicle shall not exceed 2400mm, keeping in view the operating height of top switch should not exceed 1750mm from FFL including base channel

ix. Three phase bus bars shall be of high conductivity electrolytic Aluminium/Copper as stated in B.O.Q.

x. The bus bars shall be air insulated and housed in a separate compartment, segregated from all other compartments.

xi. Bus bars & bus bar connections shall be of uniform cross section shall be suitable for carrying rated current continuously and short circuit current for specified duration without overheating. The bus bars connections shall be adequately supported on insulators to withstand dynamic stresses due to short circuit current specified. Normal operating temperature for bus bars shall be 85 Deg C. Short circuit rating of the bus bars shall be 20 to 50 KA for 1 sec as per BOQ.

xii. All bus bar joints and bus tap joints shall be silver or tin plated. Joints shall be bolted type and shall be insulated. Spring/Lock washers shall be provided to ensure good contact on the joints.

xiii. Direct access to accidental contact with bus bars and primary connections shall be avoided by providing shrouds. All apertures and slots shall be protected by barriers to prevent accidental shorting of bus bars. To provide a tight seal between cubicles, bushings or insulating panels shall be provided for bus bars crossing from one cubicle into another.

xiv. All insulating materials used shall be non-hygroscopic and shall be treated for preventing fungus growth. Surface of insulators shall be highly glazed and treated with silicone compounds to minimize accumulation of dust, condensation and tracking

xv. Current transformers shall be of suitable ratio, burden & class/accuracy as specified in Single Line Diagram.

xvi. Current transformers shall conform to latest edition to relevant standards. The Current transformers shall be epoxy resin cast with bar Primary or ring type.

xvii. The design and construction shall be sufficiently robust to withstand thermal and dynamic stresses due to the maximum short circuit current of the circuit.

xviii. The current transformer shall preferably be capable of being left open circuited on the secondary side with primary carrying rated full load current, without overheating or damage. Short time current rating and rated withstand time shall be same as corresponding C.B.

xix. CT core laminations shall be of high grade silicon steel.

xx. Secondary terminals of CT shall be brought out to a terminal block which will be easily accessible for testing and external connections. Facility shall be provided for short circuiting and earthing of CT secondary leads through a removable and accessible link with provision for attaching test link.

xxi. Rating plate details and terminal markings shall be according to the latest edition of relevant Indian Standard specification.

xxii. Current transformers (core) shall be used for metering and protection.

xxiii. Potential Transformers shall conform to latest edition of relevant standards.

xxiv. Potential transformers shall be dry, cast epoxy resin type. The PTs shall be of single phase construction.

xxv. The PTs shall be capable of operating continuously at 110% of the rated voltage without any damage. When star - star connection is required in non-effectively or ungrounded system, the PTs shall be suitable for continuous operation with a persistent phase to ground fault.

xxvi. Maximum temperature rise of the transformer at rated burden and with rated primary voltage and frequency shall not exceed 40 Dig's above an ambient of 45 Dig's.

xxvii. HRC Fuses shall be provided secondary side. It shall be possible to replace PT fuses easily without having to de-energies the main bus bars. Prospective interrupting current rating of the fuses shall be same as the system fault level.

xxviii. Voltage transformer ratio, output and class shall be as specified in the drawing & BOQ. Name plate as per relevant standards shall be provided on the PT.

xxix. Relays type and numbers shall be in accordance with the protective scheme specified or as per drawings and B.O.Q.

xxx. Relays shall be enclosed in rectangular shaped cases, suitable for flush mounting only, dust tight covers projecting from the front cover panel. The case shall be dust tight, damp proof and tropicalised.

xxxi. Relays shall be accessible for setting from the front. Access to setting devices shall be possible only after removal of front cover.

xxxii. Protective relays shall be draw out type. Where it is not possible to provide protective relays of the draw out pattern, fixed type relays with facilities for plugging in a portable test plug shall be provided. Necessary test plugs shall be furnished along with the relays.

xxxiii. Relays shall be provided with positive action self reset type with indicator. The indicator/s shall be visible from the front.

xxxiv. Relays conform to relevant standards in all respects.

xxxv. Relays shall be provided with minimum two pairs of self or hand reset type contacts as specified. Auxiliary relays shall have the number of NO and NC contacts as specified in data sheet.

6. CIRCUIT BREAKERS:

STANDARDS

All equipment, material and components shall comply with the requirements of the latest editions of Indian Standards with updated amendments. Standards and Regulations applicable in the area where equipment is to be installed shall also be followed.

The equipment offered complying with other standards, these standards shall be equal to or superior to those specified and full details of the differences shall be furnished along with the tender.

The Panel boards shall be engineered and constructed in accordance with the latest revision of the following Indian and British standards:

1. IS/IEC: 60947-2 : Air circuit breaker/moulded case circuit breaker.
2. IS: 3156 : Voltage transformers.
3. IS: 2705 Part-I, II & III 1964 : Current transformers for metering and protection with classification burden and insulation.
4. IS: 9224 : Low voltage fuse and protection.
5. IS: 3231 : Specification for electrical relays for power system protection.
6. IS:8623 : Specification for factory built assemblies of switchgear and control gear for voltage unto and including 1000-V AC/1200 V-DC.
7. IS: 4237 : General requirements for switch gear and control gear for voltage not exceeding gear.
8. IS: 2147 : Degree of protection provided by enclosures for low voltage switch gear and control gear.
9. IS: 1018 : Switchgear and control gear selection/ installation and maintenance.
10. IS: 1248 : Direct acting electrical indicating instruments.
11. IS: 375 : Arrangement for switchgear, bus bars, main connections, auxiliary wiring and marking.
12. IS: 2959 : AC contactors for voltage not exceeding 1000V.
13. IS: 5578 : Guide for marking of insulated conductors.
14. IS: 11050 : Guide for forming system of marking and identification of conductors & apparatus terminal.
15. IS: 1248 : Direct acting indicating analogue electrical measuring instruments and testing accessories.
16. IS: 6005 : Code of practice for phosphating of iron & steel.

1. BS EN 60898 IEC 898 : Circuit breakers for over current protection for household and similar installations. 2.BS EN 60947-
2. IEC 947-2 : Low-voltage switchgear and control gear, Part 2 circuit breakers.
3. BS 54193. : Air-break switches, air-break disconnectors, and fuse combination units for voltage up to and including 1000V AC and 1200 VDC.
4. BS 5486 : Low-voltage switchgear and control gear Part 1 assemblies. Part 1 requirement for type tested and partially type tested assemblies.
5. BS 4293 : Residual Current Circuit Breaker

BS/IEC or other National standards not mentioned above but are applicable to this installation shall also apply.

WORK DESCRIPTION

i) Circuit breaker including Moulded Case Circuit Breakers (MCCB), Miniature Circuit Breakers (MCB) and Residual Current Circuit Breakers (RCCB / RCD) shall be provided according to the specification.
ii) All breakers shall be capable of withstanding the electrical, mechanical and thermal stress of the prospective fault level experience. The prospective fault levels of the various breakers shall be verified according to result in short circuit/co-ordination study specified in specification Section 11002.
iii) The drawings, specification and BOQ complement each other and which is shown or called for one shall be interpreted as being called for on both. Material, if any, which may not have been specified but fairly required to make a complete assembly of switch gear as shown on the drawing, specifications shall be construed as being required and no extra charges shall be payable on this account.

SPECIFICATIONS :

i. The MCCB shall comply with IS/IEC 60947-2. The MCCB shall be provided with over current protection by means of thermal and magnetic tripping element.
ii. All MCCB tripping mechanism shall be ambient temperature compensated. MCCB of frame sizes greater than 150 amps shall be equipped with continuously adjustable magnetic pick up setting. MCCBs used for incoming main feeders shall in addition be provided with continuously adjustable rated current settings in the range of 50 to 100% rated current.
iii. The MCCBs shall have quick make and quick break mechanism independent of the operating speed. The tripping mechanism shall be mechanically “trip free” from the handle so that the handle cannot be closed against fault conditions. All MCCBs should have isolation feature and line load reversibility.
iv. The MCCB shall be provided with door interlock handles. All handles shall be large and robust to carry out the switching operation with ease. The handle shall clearly indicate the “ON”, “OFF” and “TRIP” positions. The handle shall be able to be locked in the “ON” or “OFF” positions. When locked in the “ON” position it shall still be possible for the handle to indicate “TRIP” when the MCCB has tripped. An interlock release mechanism shall be provided to enable the door to be opened when the MCCB is locked in the “ON” position.
v. Multi-pole MCCB shall have a common-trip bar so that a fault condition on any one pole of the MCCB will cause all poles to trip simultaneously.
vi. The MCCB interrupting capacity shall be not less than that indicated on the drawings and back up discrimination/ cascading charts should be submitted of the OEM. G. MCCBs of ratings 200A and above shall be of Busbar termination type, adaptable for use with bolts and cable lugs.
vii. Automatic change over MCCBs shall be of the motorised type, fully withdrawable, with both mechanical and electrical interlock. The transfer operation shall be controllable by an adjustable time delay of between 0.1 to 30 sec. The actual transfer time of the MCCBs shall not exceed 2 sec. The motor mechanism shall utilise universal motor with electromagnetic clutch and shall be equipped with full handles to allow manual operation of the MCCB. All automatic change over MCCBs shall have a minimum mechanical life of 10,000 operations.
viii. MCCB when used for motor protection shall have characteristics suitable for the motor starting. Standard range MCCB shall not be substituted for motor protection circuits.

ix. All fully withdrawable MCCB shall have interlocks to prevent withdrawal when the MCCB is "ON".
x. All main moulded case circuit breaker shall be provided with at least 2 pairs N/O and N/C auxiliary contact.
xi. Indicating lamps shall be of the panel mounting, LED type and shall have execution plates marked with its function wherever necessary. The colour of the lamp cover shall be red for 'ON' and green for 'OFF' indicating lamps shall be provided with series resistor.

MINIATURE CIRCUIT BREAKERS (MCB)

i. MCBs shall comply with IEC 898:1995. They shall be of the current limiting type having a sealed ambient temperature independent thermal magnetic tripping mechanism providing overload and short circuit protection. All MCBs shall be of 35mm D/N symmetrical rail mounted type.
ii. The breaking capacity of MCBs shall be at least equal to the prospective fault level at the point installation, unless back-up by a current limiting upstream breaker of the same make.
iii. The MCB operating mechanism shall be mechanically trip free from the operating handle so as to prevent the contacts from being held closed against short circuit and overload conditions. It shall be of the automatic resetting type.
iv. The individual operating mechanism of each pole of a multi-pole MCB shall be directly linked within the MCB casing and not with the operating handles.
v. The operating handle shall betr" of the toggle type with possibility for mounting of padlocking facility.
vi. Each pole shall be provided with bi-metallic thermal element for overload protection and magnetic element for short circuit protection.
vii. It shall be possible to fit on site auxiliaries like shunt-trip coil, under-voltage release, ON/OFF switch or alarm switch.

RESIDUAL CURRENT CIRCUIT BREAKERS (RCCB)

i. The RCCBs shall be manufactured to trip within 0.1 second for 30 mA.
ii. RCCB shall comply with IEC 61008-2-2:1990 and shall be of the current operatetype.
iii. The RCCBs shall be of 2-pole construction for single phase and 4-pole construction for 3 phases.
iv. All RCCBs shall be complete with test buttons.
v. All RCCBs shall be batch tested and bear the appropriate test label of approval to SEB requirement.
vi. All RCCBs shall be of high sensibility type as appropriate and as specified in the drawing. They shall be of surge proof manufacture to prevent nuisance tripping due to

7. CONDUIT SYSTEM, CABLE TRAY, CABLE LADDER

WORKS DESCRIPTION :

i. This section describes the supply and installation of wiring facilities systems include conduits, cable trays, cable ladder and Trunking system, c/w associated fittings and accessories.

ii. All cables run above the suspended false ceiling, concealed in walls, columns, or on surface shall be supported by conduits, cable tray and Trunking or cable ladder system. No free slinging cable is allowed.

iii. The cable routes as shown in the drawings shall be used as a guide only. Prior to the installation, the cable routes shall be coordinated with other services. Uncoordinated and inaccessible routes after other services are installed, shall be relocated at the expense of the Contractor.

iv. All conduits, trunking, cable trays and cable ladders shall be earthed in accordance to IS: 4043.

SPECIFICATIONS

i. All conduits shall be high impact rigid 2mm thickness PVC heavy duty type
ii. Conduit shall be terminated with adopter/PVC glands as required
iii. All accessories used shall be of standard white or black colour, identical to conduit used.

8. EARTHING SYSTEM

STANDARDS

A. Complete earthing system shall be engineering and constructed in accordance with the latest revision of the following standards and the appropriate BS/IEC: 1.
   1. IS: 3043 : Earthing
   2. BS6651 : Lightning Protection System
   3. IEC 61024-1-2 : Lightning Protection System

B. The detail of the Earthing System shall also conform to the requirements of all relevant local codes, as applicable, together with the additional requirements referred to in this Specification and Drawings, whichever is the more stringent and acceptable to the Engineer.

WORK DESCRIPTION

i. This section specifies the engineering, supply, installation, testing, commissioning and setting to work of the complete earthing network for individual earthing systems, circuit protective conductors and bonding conductors. A complete earthing network comprising cables, copper tapes, electrodes and earth bonding of all relevant necessary non-current carrying metal parts of equipments/ apparatus shall have connected as required.
ii. The system shall have a common earthing system as described in the Specification and as shown on the Drawings. Individual earthing systems shall be provided as follows as per drawing. Earth main MV/LV/Generator Electrical Earthing shall have 2 connection to the earthing system:
iii. MV Electrical Earthing
iv. LV Electrical Earthing
v. Generator Earthing
vi. ELV Earthing

vii. Sufficient numbers of electrodes interconnected by Cooper/ GI (as per BOQ) to form earthing mat so that the overall earth resistance shall be less than 1 ohm for each individual earthing mat.

viii. The number of earth electrodes of the earthing mat are indicated on the drawings as minimum. The Contractor shall test the resistivity of soil at site. Exact number of earth electrodes shall be determined by the Contractor to achieve the earth resistance value subject to Engineer approval. The complete earthing installation include earth plate, earth mat detail to achieve the earth resistance value shall be included in the Contract.

ix. The Contractor shall inform the Engineer or his representative before driving Plate/ pipe earthing into the ground so that he may supervise the operation. Driving shall be carried out only in the presence of the Engineer or the representative and all earthing plates/ pipes shall be submitted for the examination before use.

SPECIFICATIONS :

i. The resistance between earthing system and the general mass of earth shall not be greater than 1 ohm.

ii. The earth loop resistance to any point in the electrical system shall not be in excess of 0.5 ohms in order to ensure satisfactory operation of protective devices.

iii. The resistance to earth shall be measured at the following:-

iv. At each electrical system ground or system neutral ground.

v. At one point on each grounding system used to ground electrical equipment enclosures.

vi. At one point on each grounding system used to ground wiring system enclosures such as metal conduits and cable sheaths or armoured.

vii. All earthing conductors shall be of high conductivity copper/ G.I. as per B.O.Q. and shall protected against mechanical damage. The cross-sectional area of earth conductors shall not be smaller than half that of the largest current carrying conductor. However, the contractor shall use the sizes specified in the bill of quantities of the Tender. Common earth mats of resistivity of less than one (1) ohm, shall be constructed below the lowest floor structure prior to any ground work construction. The earth mats shall comprise the complete earth electrodes, earth strips/grids, earth inspection chambers, earth leads, main earth terminals, earth test link boxes at ground level, etc. Each individual earthing system shall have earth leads connecting its main earth terminal directly to an earth electrode underground as specified.

viii. All earthing products/accessories shall be according to IS standards.

ix. The mating surface of all tapes at joints etc shall be cleaned before clamping and all joints shall be riveted, joint with proper connector or exothermic welded. All connections to electrical apparatus shall be made by a bolted connection in a visible and accessible position

PIPE EARTH ELECTRODE

i. G.I. pipe shall be of medium class 100mm dia and 3m in length.

ii. G.I. Pipe electrode shall be cut tapered at bottom and provided with holes of 12mm dia drilled not less than 7.5cm from each other upto 2m of length from bottom.

iii. The electrode shall be buried in the ground vertically with its top not less than 20cm below ground level.

iv. Clamping of the earth leads to the earth rod shall be made by earth clamp. The clamps shall be capable of providing a high pressure contact between the earth rod and the earth leads to achieve a low contact resistance.
v. When two or more electrodes are driven to form a group, the heads of the electrodes in the group shall be bonded to each other by means of a 25 mm x 3mm GI/ Copper strip, laid at a depth of at least 600 mm in soil.
vi. All earth electrode penetrations through basement water proofing membranes shall be provided with manufacturer's recommended water seal insert sleeve approved by Engineer. The installation of the water seal insert sleeve shall be under the supervision and endorsed by the manufacturer's representative to ensure the installation comply with the manufacturer installation detail.

PLATE EARTH ELECTRODE

i. The plate earth electrode shall consist of copper plate or G.I. plate as per item of work. The plate electrode shall be buried in ground with its faces vertical and top not less than 4.5m below Ground level. The plate shall be filled with charcoal dust and common salt filling, extending 15cm around it's on all sides.
ii. A watering pipe of 50mm dia of medium class G.I pipe shall be provided.
iii. The top of the pipe shall be provided with a funnel and a G.I. mesh screen for watering the earth. In the case of pipe electrode a removable plug shall be provided.
iv. The earthing lead from electrode onwards shall be suitably protected from mechanical injury by a suitable dia medium class G.I. pipe in case of wire and size according to strip size.
v. The overlapping of strips at joints shall done in approved manner
vi. GI strips shall be riveted with rivets/ bolted and welded.
vii. Copper strips shall be riveted with rivets/ bolted brass nuts, bolts and washers and brazed.
viii. The protection pipe within ground shall be buried at least 30 cm deep (to be increased to 60cm in case of road crossing and pavements).
ix. The portion within the building shall be recessed in walls and floors to adequate depth.
x. In the case of plate earth electrode the earthing lead shall be securely bolted to the plate with two bolts, nuts, check nuts and washers.
xi. In case of pipe electrode, it shall be connected by means of a through bolt, nuts and washers and cable socket.
xii. Main earthing conductor is taken from the earth electrode with which the connection is to be made.
xiii. No earth pit shall be fixed within 1.5 M of a wall of foundation. The location of the earth electrode will be such where the soil has reasonable chance of remaining moist. Effort shall be made to locate them in grass lawns or near flower beds or water taps.

EARTH INSPECTION CHAMBER

i. Earth electrode shall be fitted with a heavy-duty pre-cast concrete inspection chamber/pit complete with heavy-duty cover as specified on drawings.
ii. For earth electrodes located outside or on the apron of the building, earth inspection chambers shall extend to a depth of not less than 300 mm below finished ground level and kept free of soil. For earth electrodes located inside building, earth electrodes shall be

buried not less than 100 mm below the floor slab structure. Each earth electrode shall be clearly marked 'SAFETY ELECTRICAL EARTH CONNECTION – DO NOT REMOVE.

iii. The chamber and cover shall be heavy duty detail to consider the traffic load at the location of installation. The cover shall be recessed cover to receive the Architectural floor finish at the location of installation.

EARTH STRIP

i. Earth strips/grids shall be of bare GI/ Copper strips of 25 mm x 3 mm as specified.
ii. Earth strips shall be riveted or joint with proper connector to earth electrodes underground below the floor slab structure, and shall be buried not less than 300 mm below the floor slab structure.
iii. In order to minimise the mutual inductance between strips, earth strips shall be positioned at a distance not less than 6m apart unless otherwise specified.

9. LUMINAIRES (LIGHT FITTINGS) AND LAMPS

Scope:

The scope of this section comprises of Supply, erection, testing and commissioning of lighting fixtures for internal lighting & external lighting wherever required, of the specified models.

Without restricting to the generality of the foregoing, this section shall include luminaries, lamps and accessories necessary and required for the installation.

Whether specifically mentioned or not, the luminaries and lamps shall be provided with all fixing devices, terminal blocks, holders etc. as required.

General Requirements:

All the luminaries and lamps shall be LED type of best quality and as per approved makes. Wherever alternative makes are specified the choice of selection shall remain with the Engineer-in-Charge.

The luminaries and lamps shall be fixed in a neat work man like manner, true to level and in accordance with manufacturer's instructions.

The luminaries and lamps shall be provided with such accessories as are required to complete the item in working condition whether specifically mentioned in the specifications, drawings or not.

Luminaries:

1. Luminaries shall comply with relevant IS.
2. Unless otherwise indicated, enclosure of luminaries shall provide a minimum degree of protection of IP20 when located within buildings and IP 44 when located outside buildings, but luminaries mounted externally; and less than 2 M above finished ground or paved level shall be IP 54 unless

specified in BOQ. For area where chance of water leakage is there fitting should be of IP65 & IP 66

3. Unless otherwise indicated, luminaries, both with and without built-in ballast or transformers shall be suitable for direct mounting on normally flammable surface.
4. Where specific requirements related to flame propagation and flammability of translucent covers are indicated, certificates of tests shall be submitted to the Engineer-in-Charge. The tests shall comply with relevant IS.
5. Terminal blocks for connection of the supply cables shall be of adequate size for the size of conductors forming the loop in wiring unless separate tails are required. Wherever indicated, the terminal block shall incorporate a fuse of suitable type and rating.
6. Ballasts for tubular fluorescent lamps shall have a maximum value of harmonics complying with the colour headed “without H Marking" in Table VII of BS 288. Power factor correction shall be provided and this shall not be less than 0.85 lagging unless otherwise indicated.
7. Translucent covers and reflective surfaces shall be clean at the completion of the works.

Applicable BIS standards:

The lighting and their associated accessories such as lamps, reflectors, housings, ballasts etc. shall comply with the latest applicable standards, more specifically the following:

General and safety requirements for luminaries:

Tubular fluorescent lamps	IS-1913 (Part–1)
Self- Ballasted LED Lamps for General Lighting Services Part 1 & Part-2 Safety Requirements & Performance Requirements	IS- 16101 : 2012; IS- 16102(Part 1) : 2012; IS- 16102(Part 2) : 2012
Led Modules for General Lighting Part 1 & Part-2 Safety Requirements & Performance Requirements	IS- 16103(Part 1) : 2012; IS- 16103(Part 2) : 2012
Safety of Lamp Control Gear Part 2 Particular Requirements Section 13 d.c. or a.c. Supplied Electronic Controlgear for Led Modules	IS- 15885(Part2/Sec13): 2012
Industrial lighting fittings with metal reflectors	IS – 1977
Decorative lighting outfits	IS – 5077
Bayonet lamp holders	IS – 1258
BI-pin lamp holders for tubular fluorescent Lamps	IS – 3323
Electronic Ballasts for fluorescent lamps –General &	IS – 13021 (Part–1)

safety requirement	
Electronic ballasts for fluorescent lamps –Performance requirement	IS – 13021 (part – 2)
Ballast for HP MV lamps	IS – 6616
Tubular fluorescent lamps	IS – 2418 (part–1 to 4)
Luminaries – general requirement	IS – 10322 (part – 1)
Luminaries – constructional requirement	IS – 10322 (part – 2)
Luminaries – screw and screw-less Termination	IS – 10322 (part – 3)
Luminaries – methods of tests	IS – 10322 (part – 4)
Particular requirement – general purpose Luminaries	IS – 10322 (part-5 sec-1)
Particular requirement– recessed Luminaries	IS – 10322 (part- 5/sec-2)
Particular requirement – luminaries for Road and street lighting	IS – 10322 (part-5/sec-3)
Particular requirement – portable general Purpose luminaries	IS– 10322 (part-5/sec-4)
Particular requirement – Flood lighting	IS– 10322 (part-5/sec-5)
Particular requirements --- Street light Pole	IS-2629/2633/4759

SPECIFICATIONS :

i. Lamps shall be of the type and ratings as indicated.
ii. All lamps shall be supplied and installed by the contractor unless otherwise directed.
iii. Lamp caps shall be suitable for the lamp holders listed socket by means of a locking ring.

Support and Fixings:

i. Where fluorescent luminaries 1200 mm or more in length are supported directly by the conduit system, they shall be fixed to two circular conduit boxes both of which shall form an integral part of the conduit system.
ii. Where the weight of a luminaire is supported by a conduit box or cable Trunking, the fixing of the conduit box or Trunking shall be adequate for the purpose and approved by Engineer-in-Charge.

iii. Luminaries fitted with tungsten filament lamps and having metal back plates shall not be fixed directly to conduit box in which thermoplastic material is the principal load bearing member.
iv. Where luminaries are supported from the structure other than by the conduit system, the supports shall be adequate for the purpose and approved by Engineer-in-Charge.
v. Luminaries mounted on or recessed into suspended ceilings shall not support luminaries unless specifically shown and approved.
vi. For wall mounted luminaries, the mounting height shall be 1900 mm above finished floor level, measured to the centre of the conduit box, unless otherwise indicated.

Wiring Connections:

i. Where luminaries, are fixed at places other than circular conduit boxes or are supported by pedants or chains, the final circuit wiring shall terminate at a terminal block in the conduit box.
ii. Where luminaries having fluorescent tubes are fixed direct to circular conduit boxes, the final circuit wiring may be terminated within the luminaries unless otherwise indicated. The wiring shall enter each luminaire at the conduit entry nearest to the terminal block and where a loop in wiring system is used, leave by the same entry; wiring shall not pass through a luminaries unless the approval of the Engineer-in-Charge.
iii. Where luminaries are mounted on or recessed into a suspended ceiling, connection shall be by flexible cord from a plug-in ceiling rose unless otherwise indicated. The plug-in ceiling rose shall be located not more than 500 mm from the access in the ceiling and shall be firmly supported, unless otherwise approved by the Engineer-in-Charge.
iv. Cables and flexible cords for final connections to luminaries shall be suitable for the operating temperature of the luminaire.
v. The size of final connection cables or flexible cords shall be as indicated.
vi. Cables and cords passing close to ballast within a luminaire shall be suitable for the operating temperature of the ballast.
vii. A protective conductor shall connect the earthing terminal or earthing contact of each luminaire to an earthing terminal incorporated in the adjacent conduit box. Where the final connection is by flexible cord, the protective conductor shall form part of the core.

10. ELECTRICAL GENERAL PROVISIONS:

WORK DESCRIPTION:

i. The scope of works for all electrical works and systems comprises engineering, supply, delivery, installation, testing and commissioning, handover, training, maintenance and warranty all as described or reasonably implied in the Contract. The Contractor is obliged to provide fully functioning works and systems in conformance with the requirements of the Contract. In the event certain items are not fully described or indicated in the Contract, but deemed essential by the Engineer for the performance of the works and systems then the provision of such items shall form part of the Contractors scope of works at no additional cost to the Owner.
ii. The Contractor shall be responsible to co-ordinate the equipment and services and shall produce properly co-ordinated shop drawings to demonstrate the installation comply with the performance requirement with shop drawing, calculations and details. A. Shop drawings shall take into account actual measurement and setting out dimensions/levels obtained and determined by the Contractor on site, actual equipment/material used, actual routing of services, co-ordination with all installation, and site conditions/constraints. This specification

is intended to cover installation, testing and commissioning of LV Panels and associated equipment/ materials, panels, etc.

10.1 SCOPE OF WORK :

The electrical and ELV installation shall include the following :

i. Liaison with the local supply Authority to obtain and coordinate provision of incoming electricity supply.
ii. Installation, testing & commissioning of MV system including incoming electricity supply, consumer main MV switchboard, cabling to component MV switchboards, cabling to power transformer, power transformers and associated accessories to SEB requirement and arrange SEB acceptance upon completed.
iii. Supply, installation, testing & commissioning of telephone system including incoming telephone lines, component telephone distribution panel at each level, interconnecting cablings and associated accessories.
iv. To provide telephone cabling as specified on the drawings.
v. Complete central earthing systems for connection with component electrical systems.
vi. Complete LV distribution system including main LV switchboard, automatic power factor correction devices, sub-boards and distribution boards, UPS and associated distribution main and sub-main cabling and associated accessories.
vii. Complete lighting and power installation including all final circuiting work and associated accessories.
viii. Normal and emergency lighting supply and installation and associated accessories.
ix. Complete earthing system.
x. Complete lightning protection system and associated accessories.
xi. Complete telephone cabling system and associated accessories.
xii. Complete wiring work to external/landscape and public area architectural/special lighting and dimming systems and associated accessories.
xiii. Complete cable support system for future structure cabling system and associate works.
xiv. Miscellaneous works like providing and fixing of rubber mats, fire buckets, first aid box, fire extinguishers, etc.
xv. All associated interfacing power supply work to other mechanical installations.
xvi. All interfacing works with the Building Management System for remote control and monitoring.
xvii. All associated interfacing works with other M&E installations.
xviii. Other works as shown on the Drawings and described elsewhere in the Contract documents.

10.2 CODES AND STANDARD :

i. The design, manufacture, inspection, testing and performance shall comply with all the currently applicable statutes, safety codes, relevant Bureau of Indian Standards (BIS), British Standards (BS), International Electro Technical Commission (IEC) publication, NEMA & VDE Standards amended up to date.
ii. The design engineering, manufacturing and the installation shall be in accordance with established codes, sound engineering, practices and specifications. Further, the same shall conform to the statutory regulations applicable in the country. Contractor shall obtain all approvals from statutory authorities, e.g. Electrical inspector, SEB or any other agency as applicable before commissioning of electrical system if required.

iii. Some of the relevant Indian and British Standards are listed below.
iv. Indian Electricity Act.
v. Indian Electricity Rules.
vi. Factory Act.
vii. Any other standard may be followed provided it is equivalent or more stringent than the standards specified above.

11. ACCEPTABLE MAKES OF MATERIALS – ELECTRICALS

S.NO	Details of Materials / Equipment	Manufacturer
1.	MAIN LT PANEL AND MOTOR CONTROL CENTRE	L&T, SIEMENS, C&S, SCHNEIDER (OR FIRMS WITH VALID CPRI TEST CERTIFICATES)
2.	MCCB, MCB, RCCB, ELCB	LEGRAND, LARSEN & TOUBRO, HAGER, SCHNEIDER ELECTRIC (MERLIN GERIN),
3.	DISTRIBUTION BOARD	LEGRAND, LARSEN & TOUBRO, HAGER, SCHNEIDER ELECTRIC (MERLIN GERIN),
4.	POLY CARBONATE MCB DB	LEGRAND, HENSEL, HAGER OR EQUIVALENT
5.	CHANGE OVER SWITCH	HPL-SOCOMEC, LARSEN& TOUBRO, GE, SIEMENS
6.	METAL CLAD SHEET STEEL ENCLOSURE SOCKET/PLUG BOX	LEGRAND, L&T, HAGER, SIEMENS, SCHNEIDER, HENSEL
7.	SWITCH FUSE UNIT, HRC FUSE	L&T, ABB,GE, SIEMENS
8.	HRC HBC FUSES & BASES	L&T, SIEMENS, LEGRAND, SCHNEIDER
9.	LOAD BREAK SWITCHES	L&T, SIEMENS, GE, SCHNEIDER
10.	MODULAR PLATE SWITCHES AND SOCKETS	LEGRAND, CLIPSAL, CRABTREE, MK
11.	OVERLOAD RELAYS WITH BUILT IN SINGLE PHASE PREVENTER	LARSEN & TOUBRO (ESBEE), SIEMENS, SCHNEIDER ELECTRIC (TELEMECANIQUE-LDR SERIES)

S.NO	Details of Materials / Equipment	Manufacturer
12.	ELECTRONIC DIGITAL METERS (A/V/PF/HZ/KW/KWH) WITH LED DISPLAY	CG SCHLUMBERGER, SECURE, L&T- CONZERV
13.	XLPE ALUMINIUM/COPPER CONDUCTOR ARMOURED MV CABLES UPTO 1100 V GRADE	FINOLEX, RR KABEL, POLYCAB, HAVELLS, CCI
14.	1100 VOLTS GRADE FRLS PVC CONTROL CABLES	FINOLEX, RR KABEL, POLYCAB, HAVELLS, L&T
15.	LT JOINTING KIT / TERMINATION	RAYCHEM, SAFE KIT, M-SEAL
16.	CABLE GLANDS DOUBLE COMPRESSION WITH EARTHING LINKS	COMET, PEECO, GRIPWELL, DOWELLS
17.	BIMETTALIC CABLE LUG	DOWELL'S , LAPP KABEL, COMET
18.	PVC INSULATED COPPER CONDUCTOR STRANDED FLEXIBLE WIRES (FRLS)	POLYCAB, FINOLEX, RR KABEL, HAVELLS, NICCO,
19.	PVC CONDUIT & ACCESSORIES (ISI APPROVED)	POLYCAB, HARSH, BERLIA, AKG
20.	MS CONDUIT (ISI APPROVED)	BEC, AKG, PRECISION
21	CEILING FAN	CROMPTON GREAVES, POLAR, BAJAJ, HAVELLS,
22.	LIGHT FIXTURES	WIPRO/ PHILIPS/ BAJAJ/EVEREADY AS PER BOQ
23.	EXTERNAL LIGHTING FIXTURE, POLES	WIPRO/ PHILIPS/ BAJAJ/ CROMPTON/ AS PER BOQ
24.	LAMPS	PHILIPS, HAVELLS, OSRAM,EVEREADY

S.NO	Details of Materials / Equipment	Manufacturer
25.	SELECTOR SWITCH, TOGGLE SWITCH	SALZER (LARSEN & TOUBRO), KAYCEE, SIEMENS
26.	220/24V TRANSFORMERS	VOLSTAT ELECTRONICS, AUTOMATIC ELECTRIC
27.	LIGHTNING PROTECTION	INDELEC, PIORTEH, POUYET
28.	FLEXIBLE CONDUIT	LAPP, HENSEL, JAINSONS
29.	BAKELITE SHEET	HYLAM/FORMICA/GREENLAM

SECTION 8

ANNEXURE – I

UNPRICED BOQ FORMAT

SL NO	MAKE AND MODEL	DESCRIPTION	QTY

Name of Work : SUPPLY, INSTALLATION AND COMMISSIONING OF VISUAL DISPLAY AND CONTROL SYSTEM, EXTERIOR DEVELOPMENT INCLUDING CAFETERIA AND PARKING, ROOFING AND ASSOCIATED CIVIL AND ELECTRICAL WORKS

BILL OF QUANTITIES

Sl. No.	Item Description	Qnty	Unit	RATE in INR (In figure & in words) Inclusive of all charges and GST	TOTAL AMOUNT in INR (in figure & in words)
A. VIDEO DISPAY AND CONTROL SYSTEM					
1	Supply of IPS LED Panel	16			
2	Supply of 16X16 Matrix Switch	4			
3	Suplly of HDMI Extender Set	4			
4	Supply of HDMI Repeater cum Audio embedder	4			
5	Supply of PTZ Camera	2			
6	Suplly of Streaming and Recording Hardware	1			
7	Supply of 10 meter extention cable	16			
8	Cables, connextors and Installation	1			
9	Supply of Digital Podium	1			
SUB TOTAL A					
B. ASSOCIATED ELECTRICAL WORKS					
Sl. No.	**Item Desscription**	**Qnty**	**Unit**	**RATE in INR (In figure & in words) Inclusive of all charges and GST**	**TOTAL AMOUNT in INR (in figure & in words)**
1	Wiring for light/ fan/ call bell point with 2x1.5 sq. mm. P.V.C. insulated single core unsheathed industrial (Multistrand) cable HFFR/ZHFR conforming to IS-694: 1990 with flexible bright annealed electrolytic copper conductor for voltage grade up to 1100 volts (Finolex /RR Kabel /Nicco or Equivalent Make as approved by the Deptt.) in surface/ recessed conduit wiring system with 2 mm thick 20mm dia rigid low halogen SFT PVC IS: 9537 Part - III conduit (Berlia/ AKG / Precision/ Presto Plast/Polycab/ MW or equivalent make as approved by the Deptt.) including 6 Amp flush type switch/ bell push (Anchor penta /Gold medal /Kolor kany.Kom/Havells or equivalent make as approved by the Deptt.) in GI/ MS switch board (ISI marked) with phenolic laminated sheet cover ,ceiling rose (Anchor penta /Gold medal /Kolor kany.Kom/Havells or equivalent make as approved by the Deptt.) etc. complete				
a	Short point up to 3.00 metre. length.	3			
b	Medium point up to 6.00 metre. Length.	16			
c	Long point up to 10.00 metre. Length.	51			
2	Wiring to 5 a pin 6 Amps plug point with 1.5 sq. mm P.V.C. insulated single core unsheathed industrial (Multistrand) cable HFFR/ZHFR conforming to IS-694: 1990 with flexible bright annealed electrolytic copper conductor for voltage grade up to 1100 volts (Finolex /RR Kabel /Nicco or Equivalent Make as approved by the Deptt.) in surface/ recessed 2 mm thick rigid low halogen SFT PVC IS: 9537 Part - III conduit (Berlia/ AKG / Precision/ Presto Plast/Polycab/ MW or equivalent make as approved by the Deptt.) wiring system including 5 pin 6 Amps flush type plug socket and 6 Amps F/T switch (Anchor penta /Gold medal /Kolor kany.Kom/Havells or equivalent make as approved by the Deptt.), GI/ MS switch board (ISI marked) with phenolic laminated sheet cover including earth continuity with 1.5 sq. mm. cable to third pin of the plug socket etc. as required complete, when placed elsewhere.				
a	Medium point up to 6.00 metre. Length.	5			
b	Long point up to 10.00 metre. Length.	5			

3	Wiring for 5 pin 16 Amps power plug point with 4 sq. mm. P.V.C. insulated single core unsheathed industrial (Multistrand) cable HFFR/ZHFR conforming to IS-694: 1990 with flexible bright annealed electrolytic copper conductor for voltage grade up to 1100 volts (Finolex /RR Kabel /Nicco or Equivalent Make as approved by the Deptt.) in surface/ recessed conduit wiring system including and fixing 5 pin 16 Amps flush type socket outlets and 16 Amps flush type switch (Anchor penta /Gold medal /Kolor kany.Kom/Havells or equivalent make as approved by the Deptt.),GI/ MS switch board (ISI marked) with phenolic laminated sheet cover earth continuity with 2.5 sq. mm cable to the 3rd pin of the socket as required complete with 2 mm thick 20 mm. dia. rigid low halogen SFT PVC IS: 9537 Part - III conduit (Berlia/ AKG / Precision/ Presto Plast/Polycab/ MW or equivalent make as approved by the Deptt.)				
a	Extra long point up to 15.00 metre. length.	3			
b	Extra long point up to 20.00 metre. Length.	5			
c	Extra long pont upto 25mtr length	8			
4	Wiring for circuit wiring with P.V.C. insulated single core unsheathed industrial (Multistrand) cable FR conforming to IS-694: 1990 with flexible bright annealed electrolytic copper conductor for voltage grade up to 1100 volts (Finolex /RR Kabel /Nicco / Anchor or Equivalent Make as approved by the Deptt.) in surface/ recessed PVC conduit (Berlia/ AKG / Precision/ Presto Plast/Polycab/ MW or equivalent make as approved by the Deptt.) wiring system.				
a	With 2 x 1.5 sq. mm. cable in 20 mm dia. 2mm thick/ heavy rigid PVC IS: 9537 Part - III conduit.	200	Meter		
b	With 3 x 1.5 sq. mm. cable in 20 mm dia. 2mm thick/ heavy rigid PVC IS: 9537 Part - III conduit.	80	Meter		
5	Wiring for drawing sub-main line with P.V.C. insulated single core unsheathed industrial (Multistrand) cable FR conforming to IS-694: 1990 with flexible bright annealed electrolytic copper conductor for voltage grade up to 1100 volts (Finolex /RR Kabel /Nicco / Anchor or Equivalent Make as approved by the Deptt.) PVC conduit (Berlia/ AKG / Precision/ Presto Plast/Polycab/ MW or equivalent make as approved by the Deptt.) including earth continuity in surface/ recessed 20 mm. dia. 2mm thick/ heavy ISI marked IS: 9537 PART - III rigid PVC conduit wiring system.				
a	With 2 x 2.5 sq. mm. + earth continuity with 1x1.5 sq. mm. in 20 mm. dia. 2mm thick/ heavy rigid PVC IS: 9537 Part - III conduit.	240	RM		
b	With 2 x 4 sq. mm. + earth continuity with 1x2.5 sq. mm. cable in 20 mm. dia. 2mm thick/ heavy rigid PVC IS: 9537 Part - III conduit.	370	RM		
c	With 2 x 6 sq. mm. + earth continuity with 1x 4 sq. mm. cable in 25 mm. dia. 2mm thick/ heavy rigid PVC IS: 9537 Part - III conduit.	180	RM		
6	Wiring for drawing sub-main line with P.V.C. insulated single core unsheathed industrial (Multistrand) cable FR conforming to IS-694: 1990 with flexible bright annealed electrolytic copper conductor for voltage grade up to 1100 volts (Finolex /RR Kabel /Nicco / Anchor or Equivalent Make as approved by the Deptt.) in surface/ recessed PVC 20 mm. dia. 2mm thick/ heavy ISI marked IS: 9537 PART - III rigid PVC conduit (Berlia/ AKG / Precision/ Presto Plast/Polycab/ MW or equivalent make as approved by the Deptt.) wiring system.				
a	With 4 x 10 sq. mm. + earth continuity with 2x6 sq. mm. cable in 40 mm. dia. 2mm thick/ heavy rigid PVC IS: 9537 Part - III conduit.	40	RM		
7	Supply and fixing of 19 mm dia 1.50mm to 2.00mm average wall thickness heavy rigid PVC IS: 9537 Part - III conduit (Berlia/ AKG / Precision/ Presto Plast/Polycab/ MW or equivalent make as approved by the Deptt.) on surface system including painting etc as required:	100	RM		

8	Supplying ,installation, testing & commissioning of 2 pair Unarmoured Telephone Cable through existing conduit in surface/ recess system.	100	RM		
9	Wiring for Co - axial Jelly Flooded (Unarmoured) (FINOLEX /RR KABEL /NICCO / ANCHOR make) cable in existing surface conduit wiring system including connection etc as required.				
a	Co - axial Jelly Flooded (Unarmoured) RG 11 (Copper)	50	RM		
10	Supplying with fitting and fixing of RJ-11 Telephone jack MODEL RANGE LEGRAND (MYRIUS), ANCHOR (VIOLA), MK (WRAPAROUND/ PLUS), ABB (CHEIRON), KOLORS (KREST), SCHNEIDER (VIVACE), CRABTREE including making necessary connection as per direction of department.	2	Each		
11	Supplying with fitting fixing of 6 amp one way modular clip in bell push with LED,MODEL RANGE LEGRAND (MYLINC), ANCHOR (ROMA), MK (IVORY), ABB (CLASSIC), KOLORS (KRAZE), SCHNEIDER (OPAL), PHILIPS, Havells including making necessary connection as per direction of department.	1	Each		
12	Supplying with fitting and fixing of electronic chime MODEL RANGE LEGRAND (MYRIUS), ANCHOR (VIOLA), MK (WRAPAROUND/ PLUS), ABB (CHEIRON), KOLORS (KREST), SCHNEIDER (VIVACE), CRABTREE including making necessary connection as per direction of department.	1	Each		
13	Supplying with fitting fixing of blank plate single in modular switch system MODEL RANGE LEGRAND (MYRIUS), ANCHOR (VIOLA), MK (WRAPAROUND/ PLUS), ABB (CHEIRON), KOLORS (KREST), SCHNEIDER (VIVACE), CRABTREE complete as per direction of department.	50	Each		
14	Supplying including installation of socket outlet 6/16 Amps 3/5 pin combine shuttered complete , MODEL RANGE LEGRAND (MYLINC), ANCHOR (ROMA), MK (IVORY), ABB (CLASSIC), KOLORS (KRAZE), SCHNEIDER (OPAL), PHILIPS, Havells including making necessary connection as per direction of department.	22	Each		
15	Supplying including installation of socket outlet 6 Amps 3 pin combine shuttered complete , MODEL RANGE LEGRAND (MYLINC), ANCHOR (ROMA), MK (IVORY), ABB (CLASSIC), KOLORS (KRAZE), SCHNEIDER (OPAL), PHILIPS, Havells including making necessary connection as per direction of department.	10	Each		
16	Supplying with fitting fixing of 16 amp one way modular clip in switch WITH LED, MODEL RANGE LEGRAND (ARTEOR), ANCHOR (AVE), MK (BLANZE), SCHNEIDER (ZENSELO) including making necessary connection as per direction of department.	22	Each		
17	Supplying with fitting fixing of 6 amp one way modular clip in switch, MODEL RANGE LEGRAND (MYLINC), ANCHOR (ROMA), MK (IVORY), ABB (CLASSIC), KOLORS (KRAZE), SCHNEIDER (OPAL), PHILIPS, Havells including making necessary connection as per direction of department.	80	Each		
18	Supplying including and fixing of following Metal boxes for MODEL RANGE LEGRAND (MYRIUS), ANCHOR (VIOLA), MK (WRAPAROUND/ PLUS), ABB (CHEIRON), KOLORS (KREST), SCHNEIDER (VIVACE), CRABTREE in surface/ recessed system complete as per direction of department.				
a	3 module type Metal	12	Each		
b	4-5 module type Metal	25	Each		
c	6-8 module type Metal	1	Each		
d	12-16 module type Metal	7	Each		

19	Supplying including fitting fixing of following front plate of suitable colour MODEL RANGE LEGRAND (MYRIUS), ANCHOR (VIOLA), MK (WRAPAROUND/ PLUS), ABB (CHEIRON), KOLORS (KREST), SCHNEIDER (VIVACE), CRABTREE as per direction of department.				
	3 Module	12	Each		
	4 Module	25	Each		
	8 Module	1	Each		
	16 Module	7	Each		
19	Supplying with fitting and fixing of electronic modular fan speed controller 2 - module type MODEL RANGE LEGRAND (MYRIUS), ANCHOR (VIOLA), MK (WRAPAROUND/ PLUS), ABB (CHEIRON), KOLORS (KREST), SCHNEIDER (VIVACE), CRABTREE including making necessary connection as per direction of department.				
a	100 watt electronic modular 4 step speed control 2 - module type	12	Each		
20	Supplying with fitting and fixing of Single Phase Modular Motor Starter switch MODEL RANGE LEGRAND (MYRIUS), ANCHOR (VIOLA), MK (WRAPAROUND/ PLUS), ABB (CHEIRON), KOLORS (KREST), SCHNEIDER (VIVACE), CRABTREE including making necessary connection as per direction of department.	7	Each		
21	Supplying with fitting and fixing MCCB income and MCB outgoing sheet steel, phosphatised, powder painted single door surface mounting vertical TPN MCB DB incorporated with bas-bar, Neutral link, Earth bar up to 125A and din rail etc fitted on wall with grouting nuts & bolts as reqd. complete with making necessary connection as approved, specified and directed by the deptt.				
a	4 way TPN (4+12) single door	1	Each		
22	Supplying with fitting and fixing single Pole 10 KA 240/415V 50Hz MCB of the following capacity complete with making necessary connection as approved, specified and directed by the deptt.				
a	Single pole 10KA 240/415V 50Hz MCB 6 to 32A	12	Each		
23	Supplying with fitting and fixing panel mounting open execution 25 KA 415V 50Hz 3P MCCB (Ics=Icu, adjustable Ir setting 0.7) without enclosure of the following capacity complete with making necessary connection as approved by the Deptt. as specified and directed by the deptt.				
a	125A	1	Each		
24	Supply, installation & testing of G.I. earth station with perforated 40 mm dia and 4.50 Metre long heady duty G.I. pipe with necessary 40 mm dia. G.I. Fittings such as Socket, Tee, elbow, nipple and 50 mmx40 mm G.I. reducing socket for funnel including locking arrangement 300 mmx300 mmx6 mm hinged cover C.I. earth plate complete with digging of earth pit, construction of brick chamber and plastering of both inner & outer surface of wall as specified and directed by the deptt .	4	Each		
25	Extra for using salt (5 K and Charcoal (64 K in pipe Earth Station pit to provide low impedance ground in location of high soil resistivity as and when required and specified by the Deptt.	4	Each		
26	Supplying & laying of 25x5mm size G.I. strips drawn on surface from earth electrode to Electrical switch gears, machineries etc complete with supply of G.I. nuts & bolts, screws etc including riveting, soldering & making necessary connection as approved, specified and directed by the deptt.	100	RM		

29	Supply and laying of following size Solid Aluminium conductor up to 10 sq mm balance stranded conductor, XLPE Insulated, cores laid up, PVC tape inner sheathed, Armour (Aluminium for single core up to 70 sq mm balance Aluminium strip, Galvanised for cables up to 2x10 sq mm.3x10 sq mm,4x6 sq mm balance all galvanised steel strip) , extruded PVC Type ST2 sheathed, 650/1100V grade as per IS 7908(Part 1) 1988, LT armoured U.G. cable laid in pucca flooring, road crossing, drain crossing as per site requirement and partially in air to connection as approved by the Depts. the control switch, through medium duty G.I. pipe (Tata/ Nezone make or equivalent as approved by the Deptt) bend and socket including excavation and refilling the trench and making good damage done as specified and directed by the deptt. (Nicco/ Havells/ RPG/CCI/Polycab/Gloster/ Finolex make)				
	3 Core A2XWY A2XFY				
a	6.00 Sq.mm 3 Core armoured U.G. cable	490	RM		
	Core - 3 & 1/2 A2XWY A2XFY				
b	25.00 Sq. mm.3 & 1/2 Core armoured U.G. cable	110	RM		
	4 Core A2XWY A2XFY				
c	10.00 Sq. mm.4 Core armoured U.G. cable	110	RM		
30	Pole Type BOP or equivalent-6030 Height 6m The materials of the pole as follows : Conforming to grade S355JO Conforming to grade S355JO , Base Plate:- Fe 410 Conforming to IS 226/ IS 2062, Foundation Bolts:- 6.8 Gr. As per IS 1367, Pole Sections:- The Octagonal Poles shall be in single piece with single longitudinal welding join. Galvanization :- The poles shall be hot dip galvanized as per IS 2629 / IS 2633 / IS 4759 standards with average coating thickness of 65 micron. The galvanizing shall be done in single dipping. Door opening:- The Octagonal poles shall have door of approximate 500 mm length at the elevation of 500 mm from the base plate. The door shall be vandal resistance and shall be weather proof to ensure safety of inside connection as approved by the Depts.. The door shall be flush with the exterior surface and shall have suitable locking arrangement. The pole shall be adequately strengthened at the location of the door compensate for the loss in section. There shall also be suitable arrangement for the purpose of earthing, Smart pack Junction box with 6 MCB & Terminals for mounting inside base compartment of Pole. Top Dia. (A/ 70 Bottom Dia. (A/ 130, Sheet Thickness 3mm, Base Plate Dimensions (L x B x 220 x 220 x 12, Foundation Bolt, Bolt Size :- (no. x dia.) 4 x 20 Dia, Pitch Circle Dia. (PC 205, Bolt Length 600, Projected Bolt Length 100, Anchor plate thickness :- 4 mm , Pole Foundation :- The octagonal poles shall be bolted on a pre- cast foundation with a set of four foundation bolts for greater rigidity. Foundation :- The foundation shall be done with (Earth work :-2.04 cubic Meters.RCC:- 1:1.5 : 3 proportion 0.65 cubic metres. Steel :- 22.43 Kg. Shuttering:-4.32 square metres. = 22.43 Kg.	25	Each		
31	Three phase Submersible motor pump set (Texmo / Crompton Greaves/ Aquatic/ CRI/ V-Guar suitable for 100 mm bore well and above. 2 HP STAGE 6 to 30 with MCB controlled Submersible motor pump set control panel.	1	Each		
32	Supplying including fitting fixing of following A.C. Ceiling fan complete with all accessories like down rod, canopy etc. of following sweeps with making necessary connection as approved by the Deptt.)as required complete and as directed by the Department [Without regulator].				
a	Premium model 1200 mm Sweep (ORIENT PSPO make) / Premium model 1050 / 1200 mm Sweep SS-390 Deco Havells make)	12	Each		
33	Supplying including fitting fixing of following A.C. Exhaust fan in the existing hole on the wall of following sweeps with making necessary connection as approved by the Deptt.)as required complete and as directed by the Department.				
a	Ventil Air DB 300 mm sweep (Havells make)	2	Each		

34	Supplying with installation testing and commissioning of Hi -- wall 3 STAR rating non ducted split type air conditioner of the following capacity with cordless remote complete with indoor and outdoor unit, copper pipe and electrical connection up to 5 m between the room unit and out door unit as approved by the Deptt.) and as directed by the department.				
	1 Ton Capacity	1	Each		
	1.5 Ton Capacity	4	Each		
35	Supplying with fitting and fixing Voltage stabilizer of the following specification complete including making necessary connection as approved, specified and directed by the deptt. (SKYLAND / Vee-Dee / V GUARD / VERTEX/ INDO/ VENUS make)				
a	5.0 KVA Automatic Input 90-280 V Out put 200-240 V	5	Each		
36	External Distribution Panel ;(EDP):-Supplying ,installing ,testing and commissioning of fabricated Floor mounting L.T panel board made of 16 SWG MS sheet with provision for hinged door and panel locking arrangement completed ,painted with 2 coat of metal primer and 2coat of enamel paint (approved shade & make) The Panel should include voltmeter ,Ammeter,selector switches ,indicators with 200A TPN copper busbars with one separate earthbus,.125A 4P MCCB--1nos of breaking capacity 35KA at incoming and 40A FP MCB-1nos & 16A SP MCB-8nos as outgoing, inter connection with bus bars , all complete including mending good the damage and painting .The MCCB should have adjustable overload setting With load/line interchangeability with thermo magnetic /static release.	1	Each		
37	Wiring for Underwater lights in fountain with all accessories like wires, connectors et as required complete	1	JOB		
38	Supply and installation at all locations, heights and levels as directed ceiling and wall mounted luminaires inclusive of all accessories,lamps,fixing in ceilings,on slab soffits or wall as required etc. complete as per specification and laid out as per detailed drawing and directions (wiring work to be paid for separately) Sample of all fixtures shall be approved of prrior to installation				
	LED downlighters round of Phillips make cat no.DN195B LED 20S 4000PSU WH S2 or equivalent				
a	18/20W	35	Each		
39	LED downlighters square of Phillips make cat no.RC380B LED 25S 6500 G4 L60 W60 PSU OD or equivalent				
b	25W	12	Each		
40	LED 18W wall bracket light Phillips make cat no. BN 021 LED 10S 6500PSU GR S1 or equivalent	5	Each		
41	LED underwater light SYSKA make Cat. No.SSK3633 9W RGB or Equivalent	8	Each		
42	LED street light 30W Philips make cat no.BRP046 LED 30CW MR S1 PSU GR or equivalent	25	Each		
43	LED bracket light for mirror top of Philips make cat no. BN 021 LED 20S PSU CW GR S2	6	Each		
44	LED Porch light SLEEK SURFACE Downlighter of Philips make Cat no.SM251C LED 20S 6500PSU WH	8	Each		
	SUB TOTAL B				
C. STAGE CURTAINS					
Sl. No.	**Item Desscription**	**Qnty**	**Unit**	**RATE in INR (In figure & in words) Inclusive of all charges and GST**	**TOTAL AMOUNT in INR (in figure & in words)**

1	Supply, Installation and Commissioning of main curtain made out of velvet cloth with horizontal motorised sliding arrangement complete with fixing of railing track, fixing brackets, runner, muster runner,3mm steel wire, 1 HP NEC/Crompton/Kirloskar Motor Drum with groove cutting , pulleys, 2 Nos Air Breaker switch (L&T or Seimens) for reverse and forward , 2 nos air micro switch for auto stop , 3 nos push button for open/stop/close position. The curtain minimum overlap should be 900mm and the curtain should be stitched in double gathering.	1	Each		
2	Supply, Installation of average frills made out from thick black cloth suspended from overhead with 42mm dia MS pipe with accessories like steel rope , clamp etc	2	Each		
3	Supply, fixing and fitting of ornamental scallop made of velvet cloth to be fixed in front of main curtain (40" long and 3" Wide) and on both side there will be hanging portion of approx. 5'5" to 6'5" long with necessary accessories with required gathering complete with trussels etc	1	Each		
SUB TOTAL C					
D. FURNITURE					
Sl. No.	**Item Desscription**	**Qnty**	**Units**	**RATE in INR (In figure & in words) Inclusive of all charges and GST**	**TOTAL AMOUNT in INR (in figure & in words)**
1	Providing and placing of premium quality Sofa for VIP Room. 1 Seater Sofa with Wooden Frame SS Leg PLPB Side with SS Pipe Frame Leathrite Tapestry Size in MM : 880 (L) x 790 (D) x 660 (H)	2	Each		
2	Providing and placing of premium quality Sofa for VIP Room. 3 Seater Sofa with Wooden Frame SS Leg PLPB Side with SS Pipe Frame Leathrite Tapestry Size in MM : 1930 (L) x 790 (D) x 660 (H)	1	Each		
3	Providing and placing of premium quality Sofa for Auditorium Lobby Area. 1 Seater Sofa With Wooden Frame SS Pipe Legs Frame Seat Back Leatherite Tapestry Size In MM 860(L) 770(D) 780(H)	2	Each		
4	Providing and placing of premium quality Sofa for Auditorium Lobby Area. 3 Seater Sofa With Wooden Frame SS Pipe Legs Frame Seat Back Leatherite Tapestry Size In MM 1860(L) 770(D) 780(H)	3	Each		

5	Providing and placing of premium quality Center Table for VIP ROOM. SIZE/ MECHANISM: 1400 x 720/650 x 650 Centre Table SS Pipe Frame Chrome Finish Top PLPB 30mm Thick Lower PLPB 18mm Thick	1	Each		
6	Providing and placing of premium quality CAFE TABLES for Auditorium Lobby area. TYPE/MECHANISM: Chrome Plated Cafe Table Pipe Frame Glass Top Size-900mm (Diameter)	1	Each		
7	Providing and placing of premium quality CAFE TABLE for Cafeteria Building. TYPE/MECHANISM: Chrome Plated Cafe Table Pipe Frame Glass Top Size-900mm (Diameter)	12	Each		
8	Providing and placing of premium quality CAFE STOOLS/CHAIR for Cafeteria Building. TYPE/MECHANISM: Chrome Plated Cafe Table Pipe Frame Glass Top Size-900mm (Diameter)	51	Each		
9	Providing and placing of premium quality chair for ressing room. TYPE/MECHANISM: Chrome Plated/Powder Coated Café Chair Pipe Frame PP Seat Shell	15	Each		
10	Providing and placing of premium qSTEEL PERSONAL LOCKER for Auditorium auditorium dressing Room. GMS-21-STEEL PERSONAL LOCKER-6 doors.w 900*450D*1830mm, guage-8mm,pc colour-60 micron, geeken make- bifma standard 3, certified.	4	Each		
SUB TOTAL D					
E. ASSOCIATED CIVIL WORKS					
Sl. No.	**Item Desscription**	**Qnty**	**Unit**	**RATE in INR (In figure & in words) Inclusive of all charges and GST**	**TOTAL AMOUNT in INR (in figure & in words)**
EARTHWORK IN EXCAVATION					
1	Earthwork in excavation for foundation trenches of walls, retaining walls, footings of column, steps, septic tank etc. including refilling (return filling) the quantity as necessary after completion of work, breaking clods in return filling, dressing, watering and ramming etc. and removal of surplus earth with all lead and lifts as directed and specified in the following classification of soils including bailing out water where necessary as directed and specified.				
a	(A) Up to a depth of 2.00m below the existing ground level.	298.944	CUM		

2	Earth/ sand filling in plinth in layers not more than 150mm thick including necessary carriage, watering, ramming etc. complete as directed and specified including payment of land compensation, forest royalty, sales tax and other duties and taxes as may be necessary.				
	(c) With river sand or silt (predominantly non plastic) by truck carriage including loading and unloading.	559.5	CUM		
PLAIN CEMENT CONCRETE WORKS					
3	Plain cement concrete works with coarse aggregate of sizes 13mm to 32mm in foundation bed for footing steps, walls, brick works etc. as directed and specified including dewatering if necessary, and curing complete (shuttering where necessary shall be measured and paid separately).				
a	(a) In prop 1cement: 3 sand :6 coarse aggregate by volume	11.37	CUM		
4	Plain cement concrete floor base in prop1:3:6 laid in alternate bays as specified with coarse agg. of size 13mm to 32mm including dewatering if necessary, and curing etc. complete.				
a	(b) 50mm thick	119.96	SQM		
5	Providing and laying 25mm thick damp proof course with cement concrete in prop 1:1.5:3 with graded stone agg. of 10mm down nominal size including providing approved damp proof admixture in proportion as recommended by the manufacturer including curing etc. complete as directed.	117.58	SQM		
REINFORCED CEMENT CONCRETE WORKS					
6	Providing and laying plain/reinforced cement croncrete works cement , coarse sand & 20mm down graded stone aggregate including dewatering if necessary, and curing complete but excluding cost of form work and reinforcement for reinforced cement concrete work (form work and reinforcement will be measured and paid separately)				
	N) Without using admixture, plasticiser				
a	a) M15 grade concrete or Prop. 1:2:4	36.62	CUM		
	ii) Columns, pillars, posts, struts, suspended floor, roof, landing, shelf and support, balcony, lintel, sill band, beam, girder, bressumer, cantilever, staircase (except spiral staircase and landing) including preparing the top surface and finishing of nosing.				
	N) Without using admixture, plasticiser				
b	a) M15 grade concrete or Prop. 1:2:4	26.65	CUM		
c	iii) Vertical and horizontal fins (thickness not more than 100mm) individually or forming box louvre and projected band.				
	N) Without using admixture, plasticiser				
	a) M15 grade concrete or Prop. 1:2:4	4.69	CUM		
TIMBER SHUTTERING (FORMWORK)					
7	Providing form work of ordinary timber planking so as to give a rough finish including centering, shuttering, strutting and propping etc., height of propping and centering below supporting floor to ceiling not exceeding 4.0M and removal of the same for in-situ reinforced concrete and plain concrete work in:				
	Foundation, footings, bases of columns, pile cap, raft and mass concrete works etc.				
a	b) Using 25mm thick plank	298.71	SQM		
	Sides of tie beams, grade beams etc. at or below ground level.				
b	b) Using 25mm thick plank	75.42	SQM		
	Columns, Pillars, Posts & Strut				

	a) Square, Rectangular, polygonal in plan or any shape like Tee/L etc. having plane vertical face				
	b) Using 25mm thick plank	47.19	SQM		
c	Sides and Soffits of Beams, beam haunchings, cantilever girders, bressumers, lintels and horizontal ties.				
	a) For depth not exceeding 1.0M.				
d	b) Using 25mm thick plank	99.92	SQM		
	Flat Surfaces such as soffits of suspended floors, roofs, landings, cantelever slabs, chajjas, balconies and the like.				
	a) Floors etc. upto 200mm in thickness.				
e	i) Using 25mm thick plank	109.05	SQM		
	Vertical surface such as walls (any thickness), parapet walls, partitions, walls of septic tank, inspection pit and the like including attached pilasters, butresses, plinth and string courses and the like.				
f	ii) Using 25mm thick plank	89.53	SQM		
MASONRY WORKS					
8	Providing soling in foundation and under floor with stone/ best quality picked jhama brick, sand packed and laid to level and in panel after preparing the subgrade as directed including all labour and materials and if necessary dewatering, complete.				
	(a).Brick on flat soling.	230.77	SQM		
a	IN SUB-STRUCTURE.				
9	Brick work in cement morter with 1st class brick including racking out joints and dewatering if necessary, and curing complete as directed				
	(I) In Sub-structure up to plinth level.				
a	(b). In proportion 1:4.	29.87	SQM		
10	IN SUPERSTRUCTURE.				
	1st class brick nogged wall in cement mortar including racking out joints and curing complete as directed in super structure above plinth up to 1st floor level (protruding M.S rod/Tor steel of column to be embeded in cement mortar and will be measured and paid separately)				
a	(A) 112mm thick brick wall	167.92	SQM		
TILES WORKS					
11	1. VITRIFIED TILES				
	A) ON FLOOR				
	Providing VITRIFIED floor tiles of approved quality of specified size, shape and thickness not less than 18mm on floors, skirtings, risers and treads of steps over 15 mm thick base of cement mortar in prop. 1:3 (1 cement : 3 coarse sand) including cutting where necessary finished with flush pointing with Fix-A-Tile (Choksey/Sika/Pedelite/Rouf) / white cement slurry mixed with approved pigment to match shade of tiles, mixed with approved pigment to match the shade of the tiles, complete at all levels as specified and directed. (Coloured pigment should be in conformity with colour of tiles and as approved and directed by the Department)				
	a) Normal range Somany/ Orient/Nitco /Varmora/VITA/ Marbito/ Make				
a	ii) Of size 600mmx600mm and above	111.47	SQM		

12	Providing polished vitrified wall tiles of approved quality, size, shape and thickness not less than 8mm on walls and skirtings over cement mortar bed 10 mm thick in prop. 1:3 (1 cement : 3 coarse sand) including cutting where necessary finished with flush pointing with Fix-A-Tile (Choksey/Sika/Pedelite/Rouf)/white cement slurry mixed with approved pigment to match shade of tilesc complete at all levels as specified and directed. (coloured pigment should be in conformity with colour of tiles and as approved and directed by the department).				
a	iii) Of size300mmx600mm and above	109.73	SQM		
13	Providing Antiskid Tiles of approved quality size, shape not less than 8mm on floor, skirting over a cement mortar bed 15mm thick of 1:3 (1 cement: 3 coarse sand) approved make fix with Fix-A-Tile (Choksey/Sika/Pedelite/Rouf)/ white cement complete at all level as specified and directed.				
	(A) VITRIFIED				
	i)Normal range (Sizes 300 mm x 300mm and above)				
a	Somany made- Durastone (Unpolished heavy duty Vitrified Tiles)	16.2	SQM		
GRANITE FLOORING					
14	Providing polished granite tiles of approved quality, size, shape and thickness not less than 18 mm on floors, skirtings, risers and treads of steps over 15 mm thick base of cement mortar in prop. 1:3 (1 cement : 3 coarse sand) including cutting where necessary finished with flush pointing with Fix-A-Tile (Choksey/Sika/Pedelite/Rouf) / white cement slurry mixed with approved pigment to match shade of tiles, mixed with approved pigment to match the shade of the tiles, complete at all levels as specified and directed. (Cement plastering to be measured and paid separately). (Coloured pigment should be in conformity with colour of tiles and as approved and directed by the Department)				
a	(ii) With White cement	1.6	SQM		
CEMENT PLASTERING					
15	10 mm thick Cement plaster in single coat on fair side of brick/concrete walls for interior plastering up to 1st floor level including arises or rounded angles not exceeding 80mm girth and finished even and smooth including curing complete as directed.				
a	(a). In cement mortar 1:4	905.11	SQM		
16	15 mm thick Cement plaster in single coat on rough side of single or half brick wall for interior plastering up to 1st floor level including arises, internal rounded angles, not exceeding 80mm girth and finished even and smooth including curing complete as directed.				
	A) On rough side				
a	(b). In cement mortar 1:4	628.4	SQM		
b	Neat Cement Punning	148.97	SQM		
GYPBOARD CEILING					

17	Supplying, fitting, fixing and painting where necessary (one coat primer and two coats of paint) M/F Suspended Ceiling which includes G.I. perimeter channels of size 0.55mm thick (having one flange of 20mm and another flange of 30mm and a web of 27mm) along with perimeter of ceiling, screw fixed to brick wall/ partition with the help of nylon sleeves and screws, at 610mm c/c. Then suspending G.I. intermediate channels of size 45mm (0.9mm thick with two equal flanges of 15mm each) from the soffit at 1220mm c/c with ceiling angle of width 25mmx10mmx0.55mm thick fixed to soffit with G.I.cleat and steel expansion fasteners. Ceiling section of 0.55mm thickness having knurled,web of 51.5mm and two equal flanges of 26mm each with lips of 10.5mm are then fixed to the intermediate channel with the help of connecting clip and in direction perpendicular to the intermediate channel at 457mm c/c, 9.5mm/ 12.5mm tapered,edge Gypboard (conforming to IS:2095-1982) is then screw fixed to ceiling section with 25mm long drywall screws at 230mm c/c. Screw fixing is done mechanically either with screw driver or drilling machine with suitable attachment. Finally, the boards are to be jointed and finished so as to have a flush look which includes filling and finishing the tapered and square edges of the,boards with jointing compound, joint paper tape and two coats of drywall topcoat suitable for Gypboard complete at all levels as specified and directed. (For light fittings, providing opening for doors, window, ventilators etc, cut out made with frame of perimeter channel supported suitably to be measured and paid separately where necessary). (ii) 12.5mm thick	158.5	SQM		
ROOFING & ROOF TREATMENT					
18	Providing Pre Painted Galvanized Iron Sheet Roofing (PPGI) at all levels including fitting and fixing with self drilling, self tapping screws complete. (Roof trusses, purlins etc. to be measured and paid separately.) TATA Blue scope/ Dyna roof / Durakolor /Wonder Roof or equivalent as directed by the Departement				
a	(iii) 0.50 mm thick	877.34	SQM		
	Providing Pre Painted Galvanized Iron Sheet (PPGI) accessories (Ridges / Valley / Gutter /Flashing) at all levels including fitting and fixing self drilling, self tapping screws complete complete. TATA Blue scope/ Dyna roof / Durakolor /Wonder Roof or equivalent as directed by the Departement.				
b	(iii) 0.50 mm thick	62.04	RM		
CHOWKATHS					
19	Providing wood work in frame (chowkaths) of doors, windows, clerestory windows and other similar works wrought, framed and fixed in position in contact with C.C or brick masonry wall including supplying, fitting and fixing with M.S. hold fast (40mmx3mmx250mm) as per design embeded in cement concrete block in proportion 1:2:4 and with two coats of kiricide oiling to the timber faces in contact with C.C and masonry as directed and specified.				
a	(a) With sal wood	0.32	CUM		
BLOCK BOARD SHUTTERS					
20	Providing and fixing flush door shutters solid core construction with frame of 1st class hard wood with cross band and face veneered ply wood face panels conforming to relevent I.S code including oxidised iron butt hinges (100mm x 75mm x 3.5mm) 6 nos with necessary wood screws.				
	a) Decorative type face panel and block board core.				
a	(ii) 35 mm thick .	5.4	SQM		
GRILL					
21	Providing, fitting and fixing M.S. grill of required pattern for windows/ clerestory windows/ openingwith M.S. flats at required spacing in frame all round, squre or round M.S. bars with round headed bolts and nuts or screws.				

	II Ornamental grill				
a	(c) Fixed to Brickwork/P.C.C/R.C.C.	815.05	KG		

WINDOWS AND VENTILATORS					
22	Supplying and installing uPVC- Fixed Windows made out of Lead free green profile having "GREENLINE" mark of BIS standard uPVC multichambered sections of wall thickness 2.4mm with corners fusion welded, fully reinforced with galvanized steel 1.5/2mm including glazing bead , grooving bead, drain cap, fisher screws, packing pieces, necessary stainless steel screws etc. complete as directed. The windows must be installed complete with all kinds of ironmongery including EPDM gaskets, bridging wedges and glass packers and with suitable water draining system. Application of Silicon sealant from inside / outside of dowcorning / GE or equivalent. With 5mm clear glass				
	(a) Fixed window using uPVC sections of size 58mm x 52mm x 2.4mm thick wall for frame and 58mm x 68mm having 2.4mm thick wall for glass sash having reinforcement of 1.5mm thick in both frame & sash. (WINSTA KOMMERLING/ FINESTA/ ENCRAFT)				
a	(iii)6mm coloured glass	13.18	SQM		
23	Supplying and installing uPVC- Sliding Windows made out of Lead free green profile having "GREENLINE" mark of BIS standard uPVC multichambered sections of wall thickness 2.4mm with corners fusion welded, fully reinforced with Galvanized steel 1.5/2mm including interlock profile, glazing bead, grooving bead, brush seal, aluminum sliding track, stainless steel rollers, sealing wedge block, Espag, int handle, pop up handle, keeper, drain cap, fisher screws, packing pieces with all necessary stainlessness screws etc. complete as directed. The windows must be installed complete with all kinds of ironmongery including EPDM gaskets, bridging wedges and glass packers and with suitable water draining system. Application of silicon sealant from inside / outside of Dowcorning / GE or equivalent. With 5mm clear glass				
	(b) 2 Track Sliding Window without Flyscreen using uPVC section of size 58mm x 53mm x 2.4mm thick wall for frame, 37mm x 61mm x 2.4mm thick wall for glass sash having 1.5mm thick reinforecement for both frame & sash, Interlock: 43mm x 23mm (Glass Panel) (WINSTA KOMMERLING/ FINESTA/ ENCRAFT)				
a	(ii) 4-Panel with 5mm clear float glass	20.07	SQM		
UPVC DOORS					
24	Supplying and installing uPVC- sliding door made out of Lead free green profile having "GREENLINE" mark of BIS standard uPVC multichambered sections of wall thickness 2.8mm with corners fusion welded, fully reinforced with Galvanized steel 2mm including interlock profile, glazing bead, grooving bead, brush seal, locking arrangement, aluminum sliding track, stainless steel rollers, sealing wedge block, Espag, int handle, pop up handle, keeper, drain cap, fisher screws, packing pieces with all necessary stainlessness screws etc. complete as directed. The windows must be installed complete with all kinds of ironmongery including EPDM gaskets, bridging wedges and glass packers and with suitable water draining system. Fittings ROTO / GQ or Equivalent. Application of silicon sealant from inside / outside of Dowcorning / GE or equivalent.				
	(II) 2 Track Sliding door without Flyscreen using uPVC section of size 58mm x 53mm x 2.8mm thick wall for frame, 37mm x 75mm x 2.8mm thick wall for glass sash, Interlock: 43mm x 23mm (Glass Panel) (WINSTA KOMMERLING/ FINESTA/ ENCRAFT)				
	(b) 4-Panel				
a	i) Using 5mm clear glass	12.37	SQM		
PLASTER OF PARIS & WALL PUTTY					

25	Providing two coats of Birla White Wall Care Putty (Water Resistant White Cement based putty for concrete/ mortar walls and ceiling both internal and external) after removing all loosely adhering material from the wall surface with the help of emery stone, putty blade or wire brush and moistening the wall with sufficient quantity of clean water as specified and directed by the department. (Total thickness of two coats is maximum 1.5mm)				
	(i) Thickness = 1.5 mm thick	780.59	SQM		
CEMENT PAINT & PRIMER					
25	a) Applying one coat of cement primer of approved brand and manufacture on new wall surface after throughly brooming the surfaces free from mortar droppings and other foreign matter and including preparing the surface even and sand papered smooth.	672.28	SQM		
WALL PAINTING					
26	Wall painting (two coats) with acrylic emulsion paint approved brand and manufacture (Asian paint/ Berger paint/ ICI paint/ J & N paint/ Nerolac) on new surface to give an even shade after throughly brushing the surfaces free from mortar droppings and other foreign matter and sand papered smooth.				
	(a).Acrylic Emulsion Paint approved brand and manufacture (Asian paint/ Berger paint/ ICI paint/ J & N paint/ Nerolac)	276.72	SQM		
PAINTING ON WOOD AND WOOD WOOD BASED SURFACES					
27	Applying priming coat over new wood and wood based surfaces over 100mm in girth/width after and including preparing the surface by throughly cleaning oil, grease, dirt snd other foreign matter , sand papering and knotting.				
	(b). With ready mixed paint , wood primer (white).	10.26	SQM		
28	Painting two coats (excluding priming coat) on new wood and wood based surface with enamel paint of approved brand and manufacture (Asian paint/ Berger paint/ ICI paint/ J & N paint/ Nerolac) to give an even shade including cleaning the surfaces of all dirt, dust and other foreign matter sand papering and stopping.				
	(i).Surfaces over 100mm in width or girth.				
	a). General purpose (Asian paint/ Berger paint/ ICI paint/ J & N paint/ Nerolac).	10.26	SQM		
PAINTING ON STEEL AND OTHER METAL SURFACE					
29	Applying primary coat over new steel and other metal surface over 100m in width or girth after preparing the surface by throughly cleaning oil,grease, dirt and other foreign matter and scoured with wire brushes, fine steels, wood scrapers and sand paper.	49.1	SQM		
	a). With ready mixed "red-lead/ red oxide" primer.				
30	Painting two coats (excluding priming coat) on new steel and other metal surface with enamel paint of approved brand and manufacture(Asian paint/ Berger paint/ ICI paint/ J & N paint/ Nerolac) to give an even shade including cleaning the surface of all dirt, dust and other foreign matter.				
	(i).Surfaces over 100mm in width or girth.				
a	a). General purpose (Asian paint/ Berger paint/ ICI paint/ J & N paint/ Nerolac).	49.1	SQM		
EXTERIOR PAINTS / COATINGS					

31	Finishing old / new wall with water proofing weather coat smooth anti-fungal exterior painting of approved make of Berger paint of required shade after cleaning and clearing the surface etc. including scaffolding complete as directed at all levels (two coats)	418.49	SQM		
	Supplying, fitting and fixing MAC blinds horizontal and vertical complete as specified and directed by the department at all levels.				
	A) Vertical blinds				
	(a) Regular				
a	iii) 75 mm	18.9	SQM		
STEEL & IRON WORKS					
32	Supplying, fitting and fixing in position reinforcement bars conforming to relevant I.S. Code for R.C.C. work/ R.B. walling including straightening, cleaning, cutting and bending to proper shapes and length as per details, supplying and binding with 20G annealed black wire and placing in position with proper blocks, supports, chairs, spacers etc. complete. (No extra measurement for lap, hook, chair, anchor etc. will be entertained in the measurement as they are included in the rate)				
	a) From Primary Producer: TATA/SAIL/Esser Steel/ Jindal steel/Shyam steel/RINL (ii)Super Ductile (SD) TMT reinforcement bars	58.26	QTL		
	b) Other ISI approved TMT reinforcement bar (SAI/BISCON/THERMAX) (For Assam Type Bldg., drain works,,retaining wall&boundary wall etc.	9.02	QTL		
ROOF TRUSS					
33	Providing, fitting, hoisting and fixing of roof trusses fabricated out of combination of any two or all of the following sections (i) Square section (ii) Rectangular Hollow section of specification RSH/SHS and (iii) M.S. circular hlollow section of Grade 210 including purlins, bottom runners and providing M.S. cleat, M.S. angle base plank, bolts and nuts with red oxide primer including fitting bottom runner and cleat etc. for fixing ceiling joist as per design complete as directed as per specifications. b) Using other ISI marked approved brand tube	15.57	QTL		
	ANGLES/ FLATS/ BOLTS AND NUTS				
34	Supplying fitting and fixing M.S.angles, M.S. flat, M.S. bolts and nuts including painting with red lead paint one coat complete as directed.				
a	b) M. S. Flats…….	0.64	QTL		
b	c) M. S. bolts & nuts…….	0.12	QTL		
STEEL RAILING					
35	Providing and fixing Stainless Steel (Grade 304) railing made of Hollow tubes, channels,plates etc., including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete, i.e. fixing the railing with necessary accessories & stainless steel dash fasteners, stainless steel bolts etc., of required size , on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer incharge.(For payment , only weight of Stainless Steel member is to be considered.No Extra payment for fixing accessories such as nuts, bolts, fasteners etc. will be considered)	338.9	KG		
36	Providing plinth protection 50mm thick to cement concrete 1 : 3 : 6 with coarse agg.of 20mm nominal size including finishing the surface with 10mm thick cement plaster in proportion 1:3 with a floting coat of neat cement finished.	17.55	SQM		

36a	Providing drain with brick work in cement mortar in proportion 1:5 with half brick thick side walls and 100mm thick C.C (1:3:6) base over one brick flat soling including 15mm thick cement plastering in prop. 1:3 finished with a floating coat of cement slurry as directed with necessary shttering for sides and earth work in excavation of foundation trenches and refilling the sides after completion of work etc. as specified.				
	ii). 300mm wide and average 250mm deep with bed slope 1 in 150 with initial depth of 100mm.	50.6	RM		
DISMANTLING WORKS					
37	Demolishing plain cement concrete including disposal of debris as directed for all levels				
	(ii) Prop (1 : 3 : 6) or richer mix	28.57	CUM		
38	Demolishing brickwork including stacking of serviceable materials and disposal of unserviceable materials as directed for all levels	9.91	CUM		
38a	Dismantling all types of corrugated/ trapezoidal sheet roofing including ridges, hips, valleys and gutters etc. and stacking the materials as directed by the department for all levels.	877.34	SQM		
39	Providing and fixing M.S. fan clamp type I or II of 16 mm dia M.S. bar, bent to shape with hooked ends in R.C.C. slabs or beams during laying,including painting the exposed portion of loop, all as per standard design complete.	15	Each		
CFB CEILING					
40	Providing and fixing of non asbestos, non combustible green building fibre cement lining boards made by autoclaved technology of SHERA or equivalent. The 6mm boards are composed of recycled fibres and cement as raw materials which includes G.I. framework of 0.50mm thick CRP surface ribbed perimeter channels (having one flange of 20mm and another flange of 30mm and a web of 27mm) along the perimeter of ceiling, screw fixed to brick wall/partition with the help of nylon sleeves and screws, at 610mm centres. Then suspending G.I. CRP surface ribbed intermediate channels of size 45mm (with two flanges of 15mm each) from the soffit at 1220mm centres with G.I. steel CRP surface ribbed ceiling angle of width 25mmx10mm fixed to soffit with GI cleat and steel expansion fasteners. Then 0.50mm thick G.I. CRP surface ribbed Ceiling section of having web of 51.5mm and two flanges of 26mm each with lips of 10.5mm are then fixed to the intermediate channel with the help of connecting clip and in direction perpendicular to the intermediate channel at 457mm centres. Next one layer of 8mm thick plain lining cement fibre SHERA board is fixed to the G.I. ceiling sections using “type S” Self tapping 3.5 x 25mm corrosion resistant drywall screws spaced at 200mm centers on all joints and 300mm centers in the field of boards. Screw fixing is done mechanically. Finally, boards and screw heads are to be jointed and finished so as to have a flush look which includes filling tapered edge and square edges of board with SHERA flexible cement based joining compound and fibre tape (As per recommended practice of manufacturer). Finally one coat of the top coat to be applied on the entire surface to give a smooth one level finish.	59.28	SQM		
41	Providing , fitting flush door shutters made of 35 mm Block Board Shutter fixed on Wooden frame finished with Decorative Laminate Sheet fitted with fitting, complete in all respect as specified and directed by the Department.	5.16	SQM		
EXTERIOR CLADDING					

42	Supply and Installation of MCM Modified Clay Material of PHOMI make, as per company standard dimension, pattern, color as specified, manufactured through unfired patended (Ref: US patent 8505840 B2 & European Patent 2157139) manufacturing technology, bonded together by using low heat temperature and having CE approval with the thermal conductivity of 0.0590 W/M.K — EN 12667 (2001), thermal resistance of 0.0568 M2 K/W— EN 12667 (2001) and Fire Insulation - Class A— ASTM E84- 15.				
a	(i) 35 piece stack stone - 595*280 mm thickness approx 2.5 mm	6.5835	SQM		
b	(ii) K Series Facing Brick - 225 x 60 mm thickness approx 2.5 mm	37.571	SQM		
c	(iii) Wood - Original - 900*180 mm thickness approx 2.5 mm	64.158	SQM		
CEILING					
43	Providing , fitting Anutone Ceiling Astral Lay-in fixed on Existing Roof Truss fitted with fitting, complete in all respect as specified and directed by the Department.	217.64	SQM		
PANELLING					
	Providing, fitting and fixing 12mm thick BWR Grade Ply Board Wall Panels with Decorative Laminate Finish over the Ply Board on one side of the Wall, . These Ply Board Wall Panels are erected / installed using the 19mm thick BWR grade Ply Board frames fixed to wall by Screws etc . complete in all respect as specified and directed by the department.	26.7	SQM		
WALL CABINET					
44	Providing , fitting and fixing Cabinets of SIZE 3.3x.45x0.3 made of BWR Grade ply board, sunmica fitted with fitting, complete in all respect as specified and directed by the Department.	9.18	SQM		
DRESSING MIRROR					
45	Providing , fitting wall Dressing Mirror as per design fixed on frame made of BWR Grade ply board, sunmica fitted with fitting, complete in all respect as specified and directed by the Department.	5.67	SQM		
COMMERCIAL KITCHEN					
46	Providing ,Installation of Commercial Kitchen as specified below : 1. SS Three burner Indian Range, 15" X 15" Square pan support, heavy duty round flame Indian burner with brass body pilot burner - 3 nos, 1.5" OD SS square pipe verticals with nylon height adjusters, 1" OD SS square pipe with cross bracing, 6" flashback SS, size: 72" x 24" x 34+6". 2. SS Single Sink, size: 24" x 24" x 34+6", 1.5" OD SS square pipe verticals with nylon height adjusters, 1" OD SS square pipe with cross bracing, 6" flashback SS. 3. SS Work Table with 2 u/s and 2 o/s, 1.5" OD SS square pipe verticals with nylon height adjusters, size: 43" x 24" x 34+24". 4. SS Wall Mounted Rack, 16 SWG thickness, 1.5" raised from three sides, front side open, size: 43" x 12". 5. SS four door chiller, 1100 litre capacity, brand ElanPro, Model no RI 1100 CF, size: 48" x 30" x 77", 6 adjustable shelves. 6. LPG pipeline with 4 connection manifold and pipeline, with 2 nos of burner connections. 7. GI Duct line and chimney with 11 feet chimney and 30 feet duct line, along with 18" Axial Flow Fan from Crompton Greaves.	1	LOT		
SANITARY WORKS					
47	EUROPEAN TYPE WATER CLOSET				

	Providing fitting and fixing vitreous china pedestal type water closet (European type W.C pan 400mm high) with seat and lead ,CP brass hinges and rubber buffers , CI/MS brackets , 40 mm dia flush band with fittings including painting of fittings and brackets, required. (Flushing Cistern to be paid separately)				
	C) Jaquar make				
	a) White				
a	(i) Size 530 x 370x 360 (Cat No.CNS-WHT-WS01) (inclusive of seat cover)	2	Each		
WASH BASIN					
48	Providing vitreous China wash basin with CI/MS brackets, C.P brass chain with plug,PVC waste pipe including painting of fittings and brackets, cutting and making good the walls wherever required. (Pillar cock, stop cocks, waste coupling are to be paid separately)				
	Basin (without pedestal)				
	(C) Jaquar Make				
a	(i) Cat. No.CNS-WHT-WB04 (550 x 400 x 198)	4	Each		
SOAP TRAY,SOAP DISH,LIQUID SOAP DISPENSER AND LIQUID SOAP					
50	Providing, fitting and fixing recessed soap tray/ soap dish complete as directed and specified.				
	(a) Parryware Make				
a	(ii) Wall Soap tray (Cat. No.C9951)	2	Each		
TOWEL RAIL,TOWEL RACK & TOWEL RING					
51	Providing, fitting and fixing CP towel rail complete as directed and specified.				
	(a) Jaquar make				
a	(ii) Continental 600mm (Cat.No. ACN-1111N)	3	Each		
BOTTLE TRAP					
	Providing, fitting and fixing Chrome Plated bottle trap complete as directed and specified.				
	(a) Jaquar make				
a	(i) Bottle trap (with internal partition) 32mm size with 250mm long wall connection pipe (Cat.No. ALD-769)	4	Each		
PVC PIPES, BENDS, JUNCTIONS, TEES ETC.					
52	Supplying, fitting and fixing PVC pipes of 6 Kg/cm2 (Supreme/Prince) or other ISI approved including joining ,fitting and fixing wiyh clamps etc.as necessary complete at all levels including below G.L as directed and specified.				
	a) In exposed surfaces or in trenches.				
a	(i) 110mm dia.	15	RM		
b	(iv) 75mm dia.	15	RM		
	b) Concealed by chiselling or breaking brick wall/C.C./R.C.C and making good to the damages.				
c	(i) 110mm dia.	30	RM		
d	(iv) 75mm dia.	20	RM		
53	Supplying, fitting and fixing 87.5 degree PVC bend of (Supreme/Prince) or other ISI approved including joining ,fitting and fixing etc.as necessary complete at all levels including below G.L as directed and specified.				
	a) In exposed surfaces or in trenches.				
	(i) 110mm dia.	4	Each		
	(iv) 75 mm dia.	4	Each		
	(b) Concealed by chiselling or breaking brick wall/C.C/R.C.C. and making good to the damages.				
	(i) 110mm dia.	3	Each		
	(iv) 75 mm dia.	3	Each		

54	Supplying fiting and fixing 87.5 degree PVC bend with door of (Supreme/ Prince) or other ISI approved including joining, fitting and fixing etc.as necessary complete at all levels including below G.L. as directed and specified.				
	a) In exposed surfaces or in trenches.				
	(ii) 110mm dia.	2	Each		
	(iv) 75 mm dia.	2	Each		
	(b) Concealed by chiselling or breaking brick wall/C.C/R.C.C. and				
	(i) 110mm dia.	3	Each		
	(iv) 75 mm dia.	3	Each		
55	Supplying fiting and fixing 45degree PVC bend of (Supreme/Prince) or other ISI approved including joining , fitting and fixing etc. as necessary complete at all levels including below G.L. as directed and specified.				
	a) In exposed surfaces or in trenches.				
	(ii) 110mm dia.	2	Each		
	(iv) 75 mm dia.	2	Each		
	(b) Concealed by chiselling or breaking brick wall/C.C/R.C.C. and making good to the damages.				
	(ii) 110mm dia.	2	Each		
	(iv) 75 mm dia.	2	Each		
56	Supplying fiting and fixing PVC Plain single tee of (Supreme/ Prince) or other ISI approved including joining, fitting and fixing etc. as necessary complete at all levels including below G.L. as directed and specified.				
	a) In exposed surfaces or in trenches.				
	(ii) 110mm dia.	4	Each		
	(iv) 75 mm dia.	4	Each		
	(b) Concealed by chiselling or breaking brick wall/C.C/R.C.C. and making good to the damages.				
	(ii) 110mm dia.	4	Each		
	(ii) 90mm dia.	4	Each		
57	Supplying fiting and fixing PVC single 'Y' of (Supreme/Prince) or other ISI approved including joining , fitting and fixing etc. as necessary complete at all levels including below G.L. as directed and specified.				
	a) In exposed surfaces or in trenches.				
	(ii) 110mm dia.	4	Each		
	(ii) 75mm dia.	4	Each		
	(b) Concealed by chiselling or breaking brick wall/C.C/R.C.C. and				
	(ii) 110mm dia.	4	Each		
	(ii) 75 mm dia.	4	Each		
GRATING					
58	Providing fiting & fixing C.P.Grating to the floors complete as directed and specified.				
	(a) 110mm dia	5	Each		
SOAK PIT AND INSPECTION CHAMBER					
59	Construction of inspection pit inside measurement 450mm x450mm x450mm flush with 100mm diameter HCl/PVC pipes and cement concrete base in proportion 1:3:6 over flat brick soling, 12cm brick wall in cement mortar in proportion 1:4 finished with 13mm cement plaster in proportion 1:2 in side wall and floor. 450mm x450mm air tight C.I. inspection pit cover and frame complete including supplying of materials, necessary excavation of pit as directed.	**3**	Each		
PIPING					
60	Supplying fitting and fixing approved uPVC Pipes of different sizes, with all necessary 'R' brand or similar approved P.V.C. Fittings such as bend, tee, elbow, reducer, nipple, plug, long screw fitting, clamps etc. complete at all levels including below G.L. as directed and specified.				

	(A) Exposed or in trenches				
	SUPREME/ PRINCE/ SFMC BRAND or other equvalent approved				
	brand (High presure pipe Sch-40)				
a	a) 50 mm dia	15	RM		
b	d) 25 mm dia	20	RM		
c	f)15 mm dia	10	RM		
	(B) Concealed by chieselling or breaking brick wall/ C.C. wall/ R.C.C. wall and making good to the damaged structure. SUPREME/ PRINCE / SFMC / FUSION BAND or other equvalent approved brand (High presure pipe Sch-40)				
d	a) 50 mm dia	20	RM		
e	d) 25 mm dia	35	RM		
f	f)15 mm dia	15	RM		
BIB COCK					
61	Supplying fitting and fixing C.P. bib cock 15mm dia of approved				
	brand directed and specified. (G.I. & C.P pipes will be measured				
	separately) II. Jaquare make				
a	(iii)2-Way bib cock	5	Each		
STOP COCK					
62	Supplying fitting and fixing chrome plated (C.P.) stop-cock of approved brand and size as mentioned below as directed and specified.(G.I. & C.P pipes will be measured and paid separately) I.Jaquar (i)15mm dia Male / Female (long thread)	5	Each		
PILLAR COCK					
63	Supplying and fitting fixing C.P. pillar cock of 15mm dia of approved				
	brand as specified and directed.				
	II.Jaguar make				
	(b)Long neck with areator	4	Each		
SINK COCK					
64	Supplying fitting and fixing Chrome Plated (C.P.) sink cock of				
	approved brand as directed and specified. (G.I. & C.P pipes will be				
	measured and paid separately)				
	V.Jaquar brand ii) Sink cock with raised 'J' shaped swinging spout	1	Each		
PIPING					
65	Supplying fitting and fixing Pipes with all necessary fittings in				
	exposed or in trenches including trenching and refilling the same etc				
	complete as directed				
	B) uPVC pipe with uPVC fittings (Using uPVC high pressure pipe) (Using SUPREME/ PRINCE/ SFMC/ FUSION brand pipe)				
	i) 15 mm dia	10	RM		
	iii) 25 mm dia	15	RM		
	vi) 50 mm dia	35	RM		
FIRE EXTINGUISHER					
66	Supply, Installation, Fixing of DRY CHEMICAL POWDER Fire Extinguisher confirming to IS: 2171 with ISI mark and CO2 cartridge will be confirming to IS: 4947 with ISI mark, Powder will be confirming to IS: 4308 with ISI Mark (10 kg) BRAND : FIRESTOP / FIREND / FIRE SHIELD	2	Each		
MISCELLENEOUS WORKS					

67	Surface dressing of ground including removing vegitation and/ or undulation of ground not exceeding 150mm deep and disposal of rubbish outside the periphery and lift up to 1800mm in all kinds of soil.	1192.84	SQM		
68	Jungle clearence including uprooting of vegitation, grass, brush-wood, sapling and trees not exceeding 300mm girth and disposal of the same outside the periphery and lift upto 1500mm	1192.84	SQM		
FLOORING AND FLOOR FINISH					
69	Construction of Granular sub-base by providing close graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per Clause 401 of MoRTH specifications (with an initial lead of 5 km) (including cost of testing of materials at site and laboratory as directed by the deptt.)				
a	(b)Using Grading II material (predominantly non plastic) by truck carriage including loading and unloading.	178.93	CUM		
70	Earth/ sand filling in plinth in layers not more than 150mm thick including necessary carriage, watering, ramming etc. complete as directed and specified including payment of land compensation, forest royalty, sales tax and other duties and taxes as may be necessary.	418.93	CUM		
CONCRETE TILES					
71	Providing polished tiles of approved quality, size, shape of specified thickness on pavers over a base of 100mm compacted sand gravel including cutting where necessary finished with flush pointing with Fix-A-Tile (Choksey / Sika / Pedelite / Rouf) /white cement slurry mixed with approved pigment to match shade of tiles complete at all levels as specified and directed. (Coloured pigment should be in conformity with colour of tiles and as approved and directed by the Department).				
	(A) SUN ROCK HIGH CTS Tiles (Pavers)				
	(a) Silicon (Pavers) 60 mm thick	375.87	SQM		

72	Providing and laying of inter locking concrete block pavement (ICBP) with cement concrete paver blocks as per IS 15658-2006 of thickness 80mm and 28 days compressive strength not less than 30 N/m over a layer of bedding sand of compacted thickness 30mm, laid either in stretcher/ running/ herringbone pattern of bonds as directed by the engineer and in proper level and grade and compacted with appropriate equipment such as plat vibrator along with spreading of a thin layer of joint filling sand to fill up the gaps between blocks including construction of edge restraint wherever required complete as per drawings and Technical specification clause 1504 of MORD.	816.97	SQM		
LANDSCAPING					
73	Supplying and dibbling of selected lawn grass [Doob grass (Cynodon dactylon), cushion grass (Axonopus affinis)] after preparing the land by ploughing / working to a depth of 40 -45 cm, removing of all unwanted debris (rubbles, pebbles, plant roots etc.), mixing of organic manure(10kg - 15kg/sq.m), levelling the surface and initial maintenance by proper and periodic rolling, mowing and irrigation etc.(as specified) for a period of six months from the date of dibbling including the application of recommended dose of fertilizers(N:P:K) mixture as specified and directed by the department.				
	(b) By Carpet grass (Axonopus affinis)	76.65	SQM		
HEDGE PLANTING / EXTERNAL HEDGE					
74	Supplying and planting of suitable plant materials for preparation protective / external hedge (50 cm wide) including the preparation of the ground by mixing organic manure and fertilizers as per specification and necessary maintenance for a period of one year from the date of planting complete as specified and directed .				
	(A) ADOPTING SINGLE ROW PLANTING METHOD				
	(i) With Duranta	176.51	RM		
REINFORCEMENT					
76	Providing precast R.C.C slab over drain ,septic tank etc. in prop. 1:2:4 reinforced with 10mm M.S. bar @ 150mm centre both ways tying with 20 gauge black annealed wire with necessary shuttering , curing etc. complete including fixing in position as directed.				
	b) 75mm thick slab	50.4	SQM		
FOUNTAIN					
77	Providing and installation of Water Fountain with all necwessary Civil,Plumbing & Electrical works as per Architects Design & Specification. Supply, Installation, Testi ng & Commissioning of Geyser Jet Nozzles 1 I nch Body: Brass (Chrome plated), Submersible pump at flow rate LPM at the head of 10m ,HP – 5, Make – Crompton / Kirlosker / Leo, Necessary plumbing work such as CPVC pipes (Ashirwad / Ajoy) and suitable for the respective working pressure 6kg/cm2 / 10kg/cm2 with all fittings coupling, tees, bends, reducers, bushes, male & female thread adopters, screwed adaptors etc. jointing with solvent chemicals.	1	LOT		
78	Electrical Panel of cubical type wall/floor mounted, 16 guage weather proof powder coated double door body IP-65 for recirculation pump in coming MCB', Relay, Contactor, Ammeter, Voltmeter, Single phase priventer, push button, TPN MCB's, SP, MCB base, Farul, connector, indiating lights. Thimbols, wiring of panel etc. Accesories Make, Panel disctance at 10 mtr from the pool and light smps near about the water body, Installation, Testing & Commissioning of fountain .	1	LOT		

TERMITE TREATMENT					
79	Pre construction anti - termite treatment by applying in the entire levelled area after plinth filling and before laying floor by applying the emulsion @ 5 (five) litres per square meter of the surface to be spread with light rodding so as to ensure proper absorption by the filled up earth (supplying of necessary tools and accessories by the contractor) as per the direction of the Department complete.				
	a) with aqueous emulsion having concentration 1:19 with chloropirophose solution (tricel or euivalent) and water, i.e. 1% solution.	SQM	111.5		
80	Pre construction anti - termite treatment by applying in the junction of walls, column with the floor before laying floor and after operation of item no. 26.1.3 above making a channel 30mmx30mm all over the walls and making rod holes @ 150mm apart up to ground level below and applying emulsion @ 11 litres per square meter of vertical plinth wall surface inside the building so as to soak the soil with the emulsion up to the ground level and refill the holes and channel with the original materials obtained in making channels (supplying of necessary tools and accessories by the contractor) as per the direction of the Department complete.				
	a) with aqueous emulsion having concentration 1:19 with chloropirophose solution (tricel or euivalent) and water, i.e. 1% solution.	SQM	111.5		
81	Pre construction anti - termite treatment by applying the soil along the external perimeter of the building (after construction completed) to a distance close to the plinth wall as specified and as directed by the deptt. up to a depth of 300mm making rod holes along the line @ 150mm apart to a depth of 300mm and applying emulsion @ 4.5 litres per running meter ensure moistening of the soil with emulsion (supplying of necessary tools and accessories by the contractor) as per the direction of the Department complete.				
	a) with aqueous emulsion having concentration 1:19 with chloropirophose solution (tricel or euivalent) and water, i.e. 1% solution.	R.M	52		
SUB TOTAL E					
GRAND TOTAL A + B + C + D + E					
In Words :					

Name of the bidder :

Address for communication :

Contact No. :