TENDER NOTICE

Tender No. - 01/Est & Estb. /MCBO-II/2024-25

Date: 12/03/2024

Re: Tender for Proposed Civil, Interior Furnishing, Electrical, Air Conditioning, Networking and Allied work (on Turnkey Basis) at Ground floor, (erstwhile Ravissant Premises), New India Center, Dr. Babasaheb Ambedkar Chowk, 17-A, Cooperage Road, Colaba, Mumbai, Maharashtra 400001.

Tenders are invited in 2 bid system for Interior Refurbishment Work at for proposed office (CBO II) located at New India Center building for selection of contractor.

The work shall be executed as per specifications and supervision of the architect,M/s. Dilip **Kulkarni and Associates.**

Tender documents can either be downloaded from company's e-procurement website www.tenderwizard.com/ NIAEPROC orwww.newindia.co.in

The New India Assurance Company Limited intense to invite e-tender from contractor for the "

The cost of tender is **Rs. 1770/- (Inclusive of GST)** (non -refundable) to be paid by DD favoring **The New India Assurance Co. Ltd.** payable at Mumbai on or before the last date of submission at the office Corporate & Broker's Office (CBO II), Ground Floor, New India Center, Dr. Babasaheb Ambedkar Chowk, 17-A, Cooperage Road, Colaba, Mumbai, Maharashtra 400001.

EMD for this work is Rs.1,80,000/- (Rupees One Lac Eighty Thousand Only) without interest to be paid by DD favoring **The New India Assurance Co. Ltd.** payable at Mumbai on or before the last date of submission above address. Scanned copy of the same (DD for tender fee & EMD) must be uploaded on the website www.tenderwizard.com/ NIAEPROC.

MSE registered firms are exempted from paying the tender cost & EMD on submission of valid certificate and the MSE certificate shall be uploaded on portal.

The estimated cost of project is Rs. 90.98/- Lacs

Bidders can submit their bid on or before 19/04/2024 up to 3.00 PM through e-procurement only i.e. through www.tenderwizard.com/ NIAEPROC.No other mode of bid submission is accepted.

Pre Bid Meeting will be held on 08/04/2024, 3.00 PM at site.

The New India Assurance Company Limited do not bind themselves to accept any or all the bids and reserve the right any or all bids without assigning any reason.

Note: No documents except tender fee & EMD or MSME certificate to be submitted offline at above given address.

लीना नेताम
क्षेत्रीय प्रबंधक
Leena Netam
Regional Manager

Regional Manager,
Corporate & Broker's Office (CBO II)

I N D E X

SPECIAL INSTRUCTIONS TO BIDDERS FOR E-TENDERING

1. Tender document with detailed terms and conditions is available on our Website www.tenderwizard.com/NIAEPROC .Interested parties may download the same and participate in the tender as per the instructions given therein, on or before the due date of the tender. The tender shall have to be submitted online through the e-Procurement system on www.tenderwizard.com/NIAEPROC.

2. As a pre-requisite for participation in the tender, vendors are required to obtain a valid Digital Certificate of Class IIB (with both signing and encryption component) and above as per Indian IT Act from the licensed Certifying Authorities (For ex. N-codes, Sify, E-mudra etc.) operating under the Root Certifying Authority of India (RCIA), Controller of Certifying Authorities (CCA). The cost of obtaining the digital certificate shall be borne by the vendor. In case any vendor so desires, he may contact our e-Procurement service provider M/s. Antares Systems, for obtaining the Digital Signature Certificate.

3. Corrigendum / amendment, if any, shall be notified on the site www.tenderwizard.com/NIAEPROCIn case any corrigendum / amendment is issued after the submission of the bid, then such vendors, who have submitted their bids, shall be intimated about the corrigendum/amendment by a system-generated email (In case of open tender corrigendum / amendment will be on the public dash board and no mail will be fired for the vendor who has not participated by that time). It shall be assumed that the information contained therein has been taken into account by the vendor. They have the choice of making changes in their bid before the due date and time.

4. Vendors are required to complete the entire process online on or before the due date of closing of the tender.

5. The Commercial/Price bid of only those vendors shall be opened whose Technical bid is found to be acceptable to us. The schedule for opening the price bid shall be advised separately.

6. Directions for submitting online offers, electronically, against e-Procurement tenders directly through internet:

   i. Vendors are advised to log on to the website www.tenderwizard.com/EPROCand arrange to register themselves at the earliest.

   ii. The system time (IST) that will be displayed on e-Procurement web page shall be the time considered for determining the expiry of due date and time of the tender and no other time shall be taken into consideration.

   iii. Vendors are advised in their own interest to ensure that their bids are submitted in e-Procurement system well before the closing date and time of bid. If the vendor intends to

change/revise the bid already entered, he may do so any number of times till the due date and time of submission deadline. However, no bid can be modified after the deadline for submission of bids.

iv. Once the entire process of submission of online bid is complete, the vendors are required to go to option own bid view through dashboard and take the print of the envelope receipt as a proof of submitted bid.

v. Bids / Offers shall not be permitted in e-Procurement system after the due date / time of tender. Hence, no bid can be submitted after the due date and time of submission has elapsed.

vi . No manual bids / offers along with electronic bids / offers shall be permitted.

7. Once the Commercial/Price bids are opened, vendors can see the rates quoted by all the participating bidders by logging on to the portal under their user ID and password and clicking on other bid view.

8. No responsibility will be taken by and/or the e-Procurement service provider for any delay due to connectivity and availability of website. They shall not have any liability to vendors for any interruption or delay in access to the site irrespective of the cause. It is advisable that vendors who are not well conversant with e-tendering procedures, start filling up the tenders much before the due date /time so that there is sufficient time available with him/her to acquaint with all the steps and seek help if they so require. Even for those who are conversant with this type of e-tendering, it is suggested to complete all the activities ahead of time. It should be noted that the individual bid becomes viewable only after the opening of the bid on/after the due date and time. Please be reassured that your bid will be viewable only to you and nobody else till the due date/ time of the tender opening. The non-availability of viewing before due date and time is true for e-tendering service provider as well as New India Assurance officials.

9. New India Assurance and/or the e-Procurement service provider shall not be responsible for any direct or indirect loss or damages and or consequential damages, arising out of the bidding process including but not limited to systems problems, inability to use the system, loss of electronic information etc.

10. Bidder should arrange for the Tender Cost/EMD as specified in the tender. The original should be posted/couriered/given in person to the Tender Inviting Authority, within the bid submission date and time of the tender.

11. The bidder has to submit the tender document(s) online well in advance before the prescribed time to avoid any delay or problem during the bid submission process.

12. The details of the Tender Cost and EMD document submitted physically to the Department before due date of submission of tender and the scanned copies furnished at the time of bid submission online should be the same otherwise the Tender will be summarily rejected. Ensure that the copies of Tender Cost and EMD are submitted under their respective heads only.

13. The Tender Inviting Authority (TIA) will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders due to local issues.

14. Bidder should take into account all the corrigenda published before submitting the bids online.

15. The bidder should see that the bid documents submitted should be free from virus/ and if the documents

could not be opened, due to virus, during tender opening, the bid is liable to be rejected.

16. Please note that if rates are not filled in BOQ, then system will show it as zero. If bidder fails to quote any rates in the BOQ, then their bid will be considered 'incomplete bid' and their bid will be rejected. Only complete bids will be considered for further evaluation.

17. Tender cost/exemption will be as per government rules applicable to MSME. Please submit relevant certificates in respective heads along with hard copies of the documents in the department for pre-verification.

18. Only bids submitted through online mode will be considered for evaluation.

19. If the amount quoted by the L1 bidder is less than 25% of the estimated cost, she/he shall submit a bank guarantee of amount equal to the difference in the amount quoted and total estimated cost. In case of freak rates for particular items, the L1 bidder shall submit a bank guarantee equal to the difference between the amount quoted and the estimated rate of particular items.

20. In case of any clarification pertaining to e-Procurement process, the vendor may contact the following agencies/personnel:

S.N	Particulars	Company Name	Contact Details
1	FOR e-Tendering Support	M/s. Antares Systems	09731468511 (Mr. Sushant) lokesh.hr@etenderwizard.com
2	For Tender related Queries	The New India Assurance Co. Ltd	**022-22020714/0602** rajesh.sahoo@newindia.co.in niranjan.thete@newindia.co.in

MOST IMPORTANT INFORMATION

Reference No. 01/Est & Estb. /MCBO-II/2024-25	
Tender for Proposed Civil, Interior Furnishing, Electrical, Air Conditioning, Networking and Allied work (on Turnkey Basis) at Ground floor, (erstwhile Ravissant Premises), New India Center, Dr. Babasaheb Ambedkar Chowk, 17-A, Cooperage Road, Colaba, Mumbai, Maharashtra 400001.	
Tender publishing date	14/03/2024
Last Date of Bid submission	19/04/2024 before 03.00 PM
Tender Fees(Non- Refundable)	Rs. 1770/- (**inclusive** of 18% GST)
EMD (refundable)	Rs. 1,80,000/-
Address for communication and submission ofEMD and Tender fees.	Chief Regional Manager, Corporate & Broker's Office (CBO II), Ground Floor, New India Center, Dr. Babasaheb Ambedkar Chowk, 17-A, Cooperage Road, Colaba, Mumbai, Maharashtra 400001
Contact Details	Telephone: **022-22020714/0602/9731468511** **E-Procurement portal:** **www.etenderwizard.com/NIAEPROC or** **https://www.newindia.co.in/portal/TenderNotice**
Architect	**M/s. Dilip Kulkarni & Assosciates** Contact Person : Mr. Rajan Indulkar Contact no. 98200 76349.

INSTRUCTION FOR FILLING IN TENDER

SECTION – I

1.0 THE TENDER OFFER:

1.1 The tender documents will be available on **www.tenderwizard.com/NIAEPROC as well as www.newindia.co.in**

1.2 The bidder has to use the E-Tender portal only for participating in the tender (Refer **SPECIAL INSTRUCTIONS TO BIDDERS FOR E-TENDERING**).

1.3 Downloading of tender document from E-Tender portal is mandatory for tender participation.

1.4 The online bids under two bid systems comprising of (1) The Technical Bid and (2) Commercial Bid should be submitted online on E-Tender portal on or before **19/04/2024 before 3.00 PM.** The commercial Bid should be quoted **excluding GST & other Taxes (if any) which shall be payable by NIA as actuals.** The various documents to be submitted Online and Offline along with the Technical and the Commercial Bid are motioned in the Section II and Annexure-1 of this document.

1.5 No Offline documents shall be accepted except of tender cost and EMD DD/MSE certificate.

1.6 At any time prior to the last date of receipt of bids, the Company may, for any reason, whether at its own initiative or in response to clarifications requested by the prospective bidders, modify the tender documents by clarifications.

1.7 The clarifications, if any, issued by the Company at any time before the due date of submission of the bid will become part of the tender document and would be notified on both the websites.

1.8 No bid will be accepted after the due date &time.

1.9 The details of the Tender Cost/ Bid Security Declaration document submitted physically to the Department before due date of submission of tender and the scanned copies furnished at the time of bid submission online should be the same otherwise the Tender will be summarily rejected. Ensure that the copies of Tender Cost/BidSecurity Declaration are submitted under their respective heads only

SECTION – II

PART A-TECHNICAL BID (ONLINE)

The scanned copies of the following documents

1) **Demand Draft** for Tender Document Fees worth R**s. 1770/-(inclusive of 18% GST)** towards Tender Fee drawn infavour of **"The New India Assurance Co., Ltd.,"** payable at Mumbai.

2) **EMD of Rs. 1,80,000/- (in form of Demand Draft)**

3) **Technical Bid as per Annexure-1 and supporting documents.**

PART A-TECHNICAL BID (OFF LINE)

The following documents

a. Original DD towards tender document Fees i.e, DD of Rs. 1770/- (or MSME Certificate)

b. Original DD towards EMD i.e, DD of Rs. 1,80,000/- (or MSME Certificate)

are required to be submitted offline in physical/hard copies to **Chief Regional Manager, Corporate & Broker's Office (CBO II), Ground Floor, New India Center, Dr. Babasaheb Ambedkar Chowk, 17-A, Cooperage Road, Colaba, Mumbai, Maharashtra 400001** on or before **19/04/2024 before 3.00 PM** in one sealed envelope super scribed as **Offline Document Submission for "Tender for Proposed Civil, Interior Furnishing, Electrical, Air Conditioning, Networking and Allied work (on Turnkey Basis) at Ground floor, (erstwhile Ravissant Premises), New India Center, Dr. Babasaheb Ambedkar Chowk, 17-A, Cooperage Road, Colaba, Mumbai, Maharashtra 400001."**

failing which the bidder(s)is/are liable to be rejected and their tender may not be opened.

The details of the DD/any other accepted instrument, physically sent, should tally with the details available in thescanned copy and the data entered during submission time. Otherwise the submitted bid will not be acceptable.

PART B-COMMERCIAL BID (ON LINE ONLY)

a) Commercial Bid as per **Annexure-3**

Note: No offline documents are required to be submitted for commercial bid.

SECTION III

- **GENERAL TERMS & CONDITIONS**

1. PROCEDURE FOR PROCESSING THE TENDER DOCUMENTS:

1.1 The Committee constituted by the Company will open the "Technical Bid" electronically and off-linedocuments cover physically. In case, offline documents sealed cover does not contain Demand Drafttowards Earnest Money Deposit and Tender documents fees, the bid offer may be rejected.

1.2 The Commercial Bids of Technically qualified bidders will be opened by the Committee electronically in the presence of the bidders who wish to be present for opening, L1 will be identified on the Total Price of the Commercial Bid & Summary.

1.3 Any Commercial Bid incomplete in any respect will be disqualified.

1.4 This procedure is subject to changes, if any, and the procedure adopted by the Company for opening thetender shall be final and binding on all the parties.

2. Location:

2.1 Address of the Premises: **Proposed Civil, Interior Furnishing, Electrical, Air Conditioning, Networking and Allied work (on Turnkey Basis) at Ground floor, (erstwhile Ravissant Premises), New India Center, Dr. Babasaheb Ambedkar Chowk, 17-A, Cooperage Road, Colaba, Mumbai, Maharashtra 400001."**

1.1 Tenderers must get acquainted with the proposed work and study drawings, designs, specifications, conditions of contract and other conditions carefully before tendering. The Tenderer shall seek clarifications on any item, if required, prior to submitting his tender. No request of any change in rates or conditions for want of information on any particular point shall be entertained after receipt of the tenders.

1.2 The Tenderer is advised to inspect the site to ascertain the nature of site, access thereto, location, facilitiesfor procurement of materials, labour rates and execution of the work. The Tenderer shall be deemed to have full knowledge of the site and drawings whether or not he actually inspects them.

2.0 **AGREEMENT:**

The successful bidder shall have to enter into a detailed Agreement. A Performa/Draft Agreement as mentioned in **Annexure-2.** However, the Company reserves the right to alter/vary/amend/modify all or any of the terms set out in the said Performa/Draft Agreement.

Encl:

- **Annexure-1(Technical Bid)**
- **Annexure-2- (Security Deposit)**
- **Annexure-3 - (Commercial Bid)**

- **GENERAL CONDITIONS**

Contractor will not disclose details of the work to any person or persons except those engaged in its performance,and only to the extent required for the particular portion.
Contractor will not give any item concerning details of the work to the press or a news disseminating agency without prior written approval from NIA / Architect contractor shall not take any pictures / photographs on sitewithout written approval of NIA /Architect.

A. DEFINITIONS:

1. The "**CONTRACT"** means the documents forming the tender and acceptance thereof any the formal agreement executed between NIA and the Contractor together with the documents referred to therein including these conditions, the specifications bills of quantities, designs, drawings and instructions issued from time to time by NIA or any person authorized by the competent Authority, and all these documentstaken together shall be deemed to form one contract and shall be complementary to one another.
2. In the contract the following expressions shall unless the context otherwise required, have the meaningshereby respectively assigned to them.
3. The expressions "**Works" or "Work"** shall unless there be something either in the subject or context repugnant to such construction, be constructed and taken to mean the works by or by virtue of the contract contracted to the executed whether temporary or permanent and whether original, altered,substituted or additional.
4. The "**Contractor"** shall mean the individual or firm or company whether incorporated or not undertaking the works and shall include the legal personal representative of such individual or the persons composingsuch firms or company and the permitted assigns of such individual or firm or firms or company.
5. The "Contract **Sum"** shall mean in case of item rate contracts, the cost of the works arrived at afterextension of the quantities shown in the schedule of quantities by the items rates quoted by the Contractor / Tenderer for the various items.
6. A "**Day"** shall mean a day of 24 hours from midnight to midnight irrespective of the number of hoursworked on that day.
7. "**Expected risks"** are risks due to riots (otherwise than among Contractor's labors / employees) and civil commotions (in so far as both these are uninsurable), wars (whether declared or not), invasions, act of foreign enemies, Hostilities, Civil war, rebellion, insurrection military or usurped power, any act of Governments, damage from aircraft, acts of God such as earthquake, lighting and unprecedented floods,and other causes over which the contractor has no control and accepted as such by NIA of the part of works in respect of which a certificate of completions has been issued.
8. "**Market-Rate"** shall be the rate as decided by Architects on the basis of the cost of

materials and labourat site when the work is to be executed plus the percentage mentioned in **Schedule `F'** to cover all overheads and profits. This is applicable to Extra items.

9. "**Schedule"** referred to in these conditions shall mean the relevant schedule (s) annexed to the Tenderdocuments / papers issued by NIA of the standard schedule of rates prescribed by NIA and the amendments thereto issued from time to time.
10. "**Project Architect**" shall mean **M/s. Dilip Kulkarni & Associates** and will include duly authorized representative orany other person empowered by them in this behalf to discharge all or any of their functions.
11. **Architect** shall mean qualified Engineer or nominated official (Authorised official) duly appointed by NIA / Architect who will act on their behalf.
12. The competent authority shall mean The **Chief Regional Manager**, **Corporate & Broker's Office (CBO II), Ground Floor, New India Center, Dr. Babasaheb Ambedkar Chowk, 17-A, Cooperage Road, Colaba, Mumbai, Maharashtra 400001** and will include duly authorised representative / officials or any other person empowered by NIA / Architect in this behalf to discharge all or any of their functions.
13. Where the context so requires words imparting the singular only include the plural and vice-versa.
14. Headings and marginal notes to these conditions shall not be deemed to form part thereof or be takeninto consideration in the interpretations or constructions thereof of the Contract.
15. **Foreclosure of Contract** in full or in part due to Abandonment or Reduction in scope of work:

If at any time after acceptance of the Tender NIA shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the works to be carried out, the Architect / NIA (Authorised official) shall give notice in writing to the effect to the contractor and the contractor shall have no claim to any payment of compensations or other issues whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.

B. <u>TERMINATIONS OF CONTRACT FOR DEATH</u>:

1. If the Contractor is an individual or a proprietary concern and the individual or the proprietor dies and ifthe Contractor is a partnership concern and one of the partner dies then unless the Competent Authority is satisfied that the legal representative of the individual contractor or of the proprietor of theconcern and in the case of partnership,

the running partners are capable of carrying out and completing the contract ,the Competent Authority shall be entitled to cancel the contract / terminate the contract as to liable for payment of any compensations to the estateof the deceased Contractor and / or to the surviving

partners of the Contractor's firm on account of the cancellations of the contract. The decision of the competent Authority that the legal representatives of the deceased Contractor or the surviving partner of the Contractor's firm cannot carry out and complete the contractshall be final and binding on the parties. In the event of such cancellation NIA shall not hold the estate of the deceased Contractor and / or the surviving partners of the Contractor's firm liable in damages for not completingthe contract.

C. CANCELLATIONS OF CONTRACT IN FULL OR PART:

If the Contractor

1) At any time makes default in proceeding with the work with due diligence and continues to do so aftera notice in writing within 7 days from the NIA/Architect/Authorised Official.
2) Commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is to given to himin that behalf by the NIA / Architect / Authorised official.
3) Fails to complete the works or items of works within individuals / particular date of completion on orbefore the date (s) of completion and does not complete them within the period specified in a noticegiven in writing on that behalf by the NIA/Architect.
4) Shall offer or give or agree to give to any person in NIA service or to any other person on his behalf any gift or considerations of any kind as an inducement or reward for doing or for bearing to do or forhaving done or fore borne to do any act in relations to obtaining or execution of this or any other contract for NIA.
5) Shall obtain a contract with NIA as a result of running tendering or other non bonafide methods ofcompetitive tendering or.
6) Shall obtain / enter into a contract with NIA in connection with which commission has been paid or agreed to be paid by him or to his knowledge unless the particulars of any such commission and the terms of payments thereof have previously been disclosed in writing to the competent Authority / NIA.Being an individual or if a firm any partner thereof shall at any time being adjudged insolvent or have a

receiving order or order for administration of liquidations or composition (other than a voluntary liquidations for the purpose of amalgamation or construction) under an insolvent act for the time being in force or make any conveyance in assignment of his effective or composition or arrangement for the benefit of his creditors or purpose so to, or if any applications be made under any Insolvency Act for the time being in force for the sequestration's of his estate or if a trust deed be executed by him for the benefit of his creditor or.

7) Being a company shall pass a resolution or the court shall make an order for the liquidation of itsaffairs or a receiver or manager on behalf of the debenture holders shall be appointed or circumstances shall arise which entitle the court or debenture holders to appoint a receiver or manager or.
8) Shall suffer an execution being levied on his goods and allows it to be continued for a period of 35days.
9) Assigns, transfer, sublets (engagement of labours on a piece work basis or of labour with materials not to be incorporated in the work shall not be deemed to be subletting) or attempts to assign transfer or subject the entire works or any portion of the work without prior approval of the competent Authority. The competent Authority may without prejudice to any other right to remedy which shall have occurred or shall occur thereafter to the NIA by written notice cancel the contract as whole or only such items of work in default fromthe contract.
10) NIA shall on such cancellation have power to:
    i. Take possession of the site and any materials, constructional plant / building etc.,implements, stores etc
    ii. Cary out the incomplete work by any means at the risk and cost of the contractor.
11) On cancellation of the contract in full or in part the site / authorized official shall determine what amount if any, is recoverable from the contractor for completion of the works or part of the works or in case of the works or part of the works is not to be completed the loss or damage suffered by NIA Indetermining the amount credit shall be given to the contractor for the value of contractor's materials taken over and incorporated in the work and use of tackle and machinery belonging to the contractor.
12) Any excess expenditure incurred or to be incurred by NIA in completing the works

or part of the worksor the excess loss or damages suffered or may be suffered by NIA as aforesaid after allowing such credit shall be recovered from any money are not sufficient the contractor shall be called in writing to pay the same within 30 days. If the contractor shall fail to pay the required sum within the aforesaid period of 30 days the NIA / Architect / authorised official shall have the right to sell any or all of the Contractor's unused materials, construction plant, implements, temporary buildings etc., and apply the proceeds of the sale thereof towards the satisfaction of any sums due from the Contractor under the contract and if thereafter there by any balance outstanding from the Contractor it shall berecovered in accordance with the provisions of the contract.

13) Any sums in excess of the amounts due to the NIA and unsold materials, construction plant etc., shall be returned to the contractor, provided always that if the cost or anticipated cost of completion by NIAof the work or part of the work is less than the amount which the contractor would have been paid and the completed the works or part of the works such benefit shall not accrue to the Contractor.

D. TENDERS, RATES ETC.

1. The work to be carried out under the contract shall except as otherwise provided in these conditions includeall labour, materials, tools, plants, equipments and transport which may be required in preparation of and for and in the full and entire execution and completion of the works. The descriptions given in the schedule of quantities shall unless otherwise stated be held to included waste on materials, carriage and cartage, carrying in, return of empties, hoisting, setting, fitting and fixing in position and all other labours necessary in and for the full and entire execution and completion as aforesaid in accordance with good practice andrecognized principles.
2. The attached bill of quantities is our best estimate of the job.
3. All the quantities therein are approximate, payments will be made on the actual measurements / certifiedby the Architect / NIA authorised official & project Architect.
4. NIA will have the right to omit, alter, add or cancel any of the items of work shown in the schedule withoutassigning any reason whatsoever and no claim for compensation will be entertained for the same, NIA is further at liberty to carry out any items of work

departmentally or through any other contractor and no compensation will be paid to the main contractor on that account.

5. Work contained in the Schedule of Quantities comprises the erection of a reinforced concrete structure, with masonry walls, windows / doors, plastering / filling etc. water tanks, plumbing / sanitary work, interiorworks, electrical work and exterior work within the premises such as roads, paving etc.
6. Before submitting the Tender, the contractor shall visit and examine the site situated at Ground floor, (erstwhile Ravissant Premises), New India Center, Dr. Babasaheb Ambedkar Chowk, 17-A, Cooperage Road, Colaba, Mumbai, Maharashtra 400001.
7. satisfy himself /herself as to the nature of the existing roads or other means of communications, the character of the soil and of the excavations, the correct dimensions ofthe work facilities for procuring various construction and other materials and shall obtain generally his own information on all matters and conditions affecting the execution of the works. No extra charge made in consequence of any misunderstanding or incorrect information on any of these points or on the grounds of insufficient description will be allowed. The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices quoted in the schedule of quantities which rates and prices shall except as otherwise provided cover all hisobligations under the contract and all matters and things necessary for the proper completion and maintenance of the works.
8. It must be clearly understood that the whole of the conditions and specifications are intended to be strictlyenforced and **that no extra work will be allowed unless they are clearly outside the spirit and meaning ofthe conditions and have been ordered in writing by NIA / Architect (authorised official)**
9. Before filling the Tender the Contractor will check all drawing and schedule of quantities and will get an immediate clarification from Architect / NIA as required on items not clearly understood. Any claim for anyloss or compensation will not be entertained on this account.
10. The rates quoted by the Contractor shall be for finished work measured in site and should include supply of all materials labour, tools tackles, marking out and clearing of the site and liaison charges, with licensed plumbers for preparing plans, line out permission from Municipal Corporation, Statutory bodies etc. unlessspecifically

mentioned otherwise. **The rates shall be exclusive of all taxes such as GST & other Tax if any**

11. The rates quoted by the Contractors should also include for providing all scaffolding, hoists, tackle and otherplant, shuttering profiles and apparatus generally required for the proper execution of the work. The contractors shall provided without extra charges all labour and apparatus required by NIA for testing and measuring the works and for weighing measuring, providing or testing the efficiency of any portion of the works and shall also at his own cost provide all planking gang ways, etc. necessary for affording access toevery part of the works.
12. The rates quoted by the Contractor should cover for necessary transport of materials from place ofavailability to the site of works.
13. The Contractor is expected to quote rate for each item after careful analysis of cost involved for the performance of the completed item considering all specifications and conditions of contract. This will avoidloss of profit or gain in case of curtailment or change of specification for any item. **In case it is noticed that the rates quoted by the tenderer for any item are Abnormally Low Rate(ALR). Analysis for such rates willhave to be furnished by the tenderer on demand, to satisfy NIA about the reasonableness of the rates. NIA may demand additional security deposit for such ALR items in form of Bank Guarantee for differenceof amount i.e. estimated rate minus quoted rates. Such additional SD shall be released on successful completion of project and certificate is issued thereof.**

E. EXTRA ITEMS

1. The NIA (authorised official) shall have the power to make any alterations in, omission from, addition to or substitutions for the schedule of rates the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work and the Contractor shall be bound to carry out the such altered / extra / new items of work in accordance with any instructions whichmay be given to him in writing signed by the NIA, and such alterations, omissions, additions or substitutions shall not invalidate the contract and any altered additional or substituted work which the contractor on the same conditions in all respects on which he agreed to do the main work. The time for completion of work may be extended for the part of the particular job at the discretion of the NIA, for only such alternations, additions or substitutions of the work, as he may consider as just and reasonable. **The rates for such additional, altered or substituted work under this clause shall be worked out in accordance with the following provisions. :-**

i. If the rates for the additional, altered or substituted work are specified in the contract for thework, the contractor is bound to carry out the additional, altered or substituted work at the same rates as are specified in the contract.

ii. If the rates for the additional, altered or substituted work are not specifically provided in the contract for the work, the rates will be derived from the rates for similar class of work as are specified in the contract for the work. The opinion of the Architect / NIA, as to whether or notthe rates can be reasonably so derived from the items in this contract, will be final and binding on the contractor.

iii. If the rates for the altered, additional or substituted work cannot be determined in the manner specified in sub clause (a) & (b) above, then the contractor shall, within 7 days of the date of receipt of order to carry out the work, inform the NIA / Architect (authorised official)of the rate which it is his intention to charge for such class of work, supported by analysis of the rate or rates claimed, based on standard market rate analysis hand book published by NBO, and the NIA / Architect shall determine the rates on the basis of the prevailing market rates of materials, transport and labour plus 15% for overheads and contractor profit and pay the contractor accordingly. The opinion of NIA / Architect (authorised official) as to current market rates of materials and labour involved will be final.

2. Architect / NIA (authorised official) shall issue instructions to the contractor in regard to what is to be done concerning on object reported by the contractor under the proceeding sub clause and such instruction maybe required to contractor to permit the examinations, excavations, or removal by a third party. Architect / NIA (authorised official) may issue instructions to the contractor in regard to be removal and disposal of thesame at the expenses of NIA If in the opinion of the Architect / NIA, the above activity has involved the contractor indirect loss of time the NIA / Architect may allow extension of time for the completion of work equal in period to assessed loss of time on this account. The

contractor shall not be eligible to claim any financial compensation due to any delay caused in this account.

3. NIA shall have the right to direct the contractor to purchase and use materials from any source for theproper execution of work.
4. Except if and to the extent otherwise provided by the contract, the provision of the General conditions of contract and special conditions shall prevail over those of any other documents forming part of the contract.Several documents forming the contract are to be taken as mutually, explanatory. Should there be any discrepancy inconsistency error or omission in the contract or any of them the matter may be referred to Architect / NIA who shall give his decisions and issue to the contractor instructions directing in what manner the work is to be carried out. The decision of the Architect / NIA (authorized official) shall be final and conclusive and the contractor shall carry out work in accordance with this decision.
5. Works shown upon the drawing but not mentioned in the specifications or described in the specificationswithout being shown on the drawings shall nevertheless be held to be included in the same manner as if they had been specifically shown upon the drawings and described in the specifications.
6. NIA reserves the right to accept or reject any or all the tenders without assigning any reasons. In otherwords, NIA do not bind themselves to accept the lowest of any tender.
7. Tender submitted by tenderer shall remain valid for acceptance for a period of 120 days from the date of opening of the tender. The tenderer shall not be entitled during the said period of 120 days, without the consent in writing of NIA to revoke, or cancel his tender. In case of revoking or cancelling his tender, varyingany terms in regard whereof without the consent of NIA in writing the tenderer shall forfeit earnest money paid by him along with thetender.
8. In case of discrepancies between schedule of quantities, the specifications and or the drawings thereof, thefollowing order of preference shall be observed.
    i. Descriptions in Schedule of Quantities.
    ii. Particular specification and special conditions, If any.
    iii. Drawings:

In any case the most stringent of the above three shall apply. The decision of the NIA / Architect in this regard is final. In case of varying or conflicting provisions made in any one document forming part of the Contract NIA shall be the deciding authority with regard to the intentions of the documents.

1. Any error in descriptions, quantities or rates in schedule of quantities or any omissions there from shall not vitiate the contract or release the contractor from the execution of the whole or any part of the work comprised therein according to drawings and specifications or from any of his obligations under the contract.

F. PAYMENT TERMS

1. **Only One Bill will be paid to the L-1 Contractor after completion of work and certification by the architectsubject to retention and other deductions. 7% of the total bill will be retained towards retention money. The same will be paid after completion of Defect Liablity Period.**

2. Income tax / cess / taxes / other / statutory levies if any shall be deducted from every running bills and finalbill payment as applicable from time to time as per Government of India / State Government.

3. All running bills (if any) as well as final bills submitted in approved proforma shall be submitted to the Architect by the contractor in quadruplicate for certification. All the bill copies shall be accompanied by measurement sheets and quantity calculation in support of the quantities contained in the bill with soft &hardcopies.

4. All the works in progress will be jointly measured by the representative of NIA and the contractor progressively. Such measurements will be recorded in the measurement book by the NIA / Architect or hisauthorities representative and signed in token of acceptance by the contractor or his authorized representative.

5. All items having a financial value shall be entered in the measurement books, level book etc. prescribed byNIA that complete record is obtained of all work performed under the contract.

6. For the purpose of taking joint measurements the contractor's representative shall be bound to be present whenever required by the Architect. If, however, he is absent for any reason whatsoever the measurementswill be taken by the NIA / Architect or his representative and these will be deemed to be correct and bindingon the contractor.

7. The contractor shall without extra charges provide assistance with every appliance, labour and other thingsnecessary for measurement of work.

G. METHODS OF MEASUREMENTS:

1. Except where any general or detailed description of work in quantities expressly shows to the contrary schedule of quantities shall be deemed to have been prepared and measurements shall be taken in accordance with the procedure laid forth in specifications not withstanding any provisions in the relevantstandard method of measurement or any general or local custom. In the case of items which are not covered by the specifications, measurements shall be taken in accordance with the relevant and latest

standard method of measurement issued by the Bureau of Indian Standards. (All Measurements will be noted as per actual without any rounding off)

H. DEFECT LIABILITY PERIOD (DLP)

1. The contractor shall **guarantee the installation/work for a period of 12 months from the date of issue of completion certificate**. Any damage or defect that may arise or lie undiscovered at the time of issue of completion certificate, connected in any way with the equipment or materials supplied by him or in the workmanship shall be rectified or replaced by the contractor at his own expense as deemed necessary by NIA or in default, NIA may cause the same to be made good by other workmen and deduct expenses (of which the certificate of NIA shall be final) from any sums that may be the or at any time thereafter, become due to the contractor or from his security deposit, or the proceeds of sale thereof, or of a sufficient portionthereof.
2. At the end of the defects liability period the contractor shall submit a written application for release ofretention money, EMD and Security Deposit. NIA shall release the money only after ensuring that all the defects pointed out by NIA/Architect till completion of DLP have been rectified by the contractor satisfactorily.
3. Any amount found due from the contractor to NIA from time to time will be recovered currently from the running bills. Similarly if, at any time, should there evidence of any lien or claim for which NIA might havebecome liable and which is chargeable to the contractor, NIA shall have the right to retain out of any payment then due or thereafter to become due an amount sufficient to completely indemnify NIA against such lien or claim and if such lien or claim remain unsettled after all payments are made, the contractor shall refund or pay to the owner all money that the latter may be complied to pay in is charging such lienor claim including all costs reasonable expenses.
4. The contractor will be fully responsible for rectifying any defects brought to his notice by NIA / project Architect in writing within **seven days of receipt of the intimation**. In case the contractor fails to attend to defects as stipulated therein, NIA reserves the right to complete the rectification through another agency ofits choice and recover the cost of such repairs from the contractors dues against running bills/ final bill / retention money for this or any other job.

I. SECURITY DEPOSIT

1. On acceptance of the tender, ***the successful tenderer shall, within the time stipulated in the letter of intent, deposit with the Employer by Demand Draft, a security deposit of 2% (two percent) of the value of the contract,*** before he is allowed to execute the contract and commence work.

2. Failure to deposit this additional amount, within the stipulated time which shall include any extension grantedby the Employer at its discretion, will make the earnest money

deposited by the tenderer liable to forfeiture and the acceptance of his tender shall be considered as withdrawn.

3. The Security Deposit will be returned after completion of Defect Liability Period.

J. LIABILITY FOR DAMAGE, DEFECTS AND RECTIFICATION THEREOF

1. If the Contractor or his workmen or employee shall injure or destroy any part of the building in which they maybe working or any building road, fence etc., contiguous to the premises on which the work or any part of it is being executed or if any damage shall happen to the work while in progress, the contractor shall upon receipt of a notice in writing in the behalf make the same good at his own expenses. If it shall appear to the NIA / Architect or his representative at any time during the construction or re-construction or prior to expiration of defects liability period that any work has been executed with unsound, imperfect or unskilled workmanship or that any materials or articles provided by the contractor for execution of the work are unsound or of a quality inferior to that contract for, or otherwise not in accordance with the contract or that any defect, shrinkage or other faults have appeared in the work arising out of defective or improper materials or workmanship, the contractor shall upon receipt of a notice in writing in that behalf from the Architect / NIA forthwith rectify or remove or reconstruct the work so specified in whole or in part as the case may require or as the case may be and / or remove the materials or articles so specified and provide other proper and suitable material or article.
2. At his own expenses, notwithstanding that the same may have been inadvertently passed, certified and paid for and in the event of his failing to do so within the period to specified by the NIA / Architect may rectify or remove and re execute the work and / or remove and replace with other, materials or articles complained of,as the case may be by either means at the risk and expense of the Contractor.
3. In case of repairs and maintenance works, splashes and droppings from white washing, painting etc., shall be removed and surface cleared simultaneously with completing of these items of wok in individual rooms, quarters or premises etc., where the work is done without waiting for completion of all other items of work inthe contract. In case the contractor fails to comply with the requirement of this condition the Architect / NIA shall have the right to get the work done by other means at the cost of the Contractor. Before taking such action, however, the NIA / Architect (authorized official) shall give three days' notice in writing to the contractor.

K. OVER PAYMENTS AND UNDER PAYMENTS:

1. Wherever any claim for the payment of a sum of money to NIA out of or under this contract against theContractor the same may be deducted by NIA from retention money / Security

deposit or any sum then due or which at any time thereafter may become due to the contractor

under this contract and failing that under any other contract with NIA or from any other sums due to the contractor from NIA which maybe available with NIA he shall pay within ten days the claim in cash / Demand Draft on demand.

2. NIA reserves the right to carry out post payment audit and technical examinations of the Running / final billincluding all supporting vouchers, abstracts etc. NIA further reserves the right to enforce recovery of any overpayments when detected, notwithstanding the fact that the amount of the final bill may be included byone of the parties as items of disputes before an arbitrator appointed under condition of this contract and notwithstanding the fact that the amount of the final bill figures in the arbitration award.
3. If as a result of such audit and / or technical examinations any overpayments is discovered in respect of anywork done by the contractor or alleged to have been done by him under the contract it shall be recovered by NIA from the Contractor by any of all methods or made of recovery as prescribed above or if any under payment is discovered, the amount shall be duly paid to the contractor by NIA.

L. COMPLETION PERIOD AND COMPENSATION CLAUSE

1. The Contractor shall commence work within 7 days from the date of receipt of letter of intent / email from NIA confirming that the purchase order is being awarded to him. The formal purchase order will be typed and mailed in due course after the letter of intent. Completion period for the entire work contained in the tender and such of the extra items, if any, which form an integral part of the contract, contained in the tender is **8 Weeks from** the date of commencement of work at site as specified in above. The time limit specified herein will be strictly adhered to and will form the essence of the Contract. 0.5% of total contract value per week up to maximum of 5%, there after the owner may get the work done at contractor's risk andcost.
2. The successful contractor will be required **to submit PERT / CPM analysis** of the entire work within 10 days of issuing the LOI showing completion period as **8 Weeks**. Progress of the work shall be checked with the PERT / CPM analysis at various stages of completion. NIA shall have the right to terminate the contract ex- party if progress of the work is found to be unsatisfactory and there are no efforts from the contractor's sideto make up for the delays if any.

M. COMPLETION CERTIFICATE

1. The work shall be considered "Virtually Complete" only after the Contractor submits to Architect / NIA thefollowing documents obtained by him through his licensed plumber / Licensed electricians.

a. As soon as the work is completed the contractor shall give notice of such completion to Architect /NIA and within thirty day of receipt of such notice, Architect /NIA shall inspect the work and shall furnish the contractor with a certificate of completion indicating.

i. The date of completion.

ii. Defects to be rectified by the Contractor and /or.
iii. Items for which payment shall be made at reduced rates.

2. When the separate periods of completion have been specified for items or groups of items, Architect / NIA shall issue separate completion certificate for such item or group of items. No certificate of completion shallbe issued, nor shall the work considered to be complete till the contractor shall have removed from the Employers premises on which the work has been executed all scaffolding, sheds, temporary structures and surplus materials except such as are required for rectification of defects, removal all huts and sanitary arrangements required for his workmen on the site in connection with the execution of work as such have been erected by the Contractor or the workmen and clear all dirt from all parts of the building (s) in upon or about which the work has been executed thereof and clean floor, all gutters and drains, ease doors and shutters, oil locks and fastenings, labeled keys clearly and handed them over to the NIA or his representative and made the whole premises fit for immediate occupations or use to the satisfaction of the NIA.
3. If the contractor shall fail to comply with of the requirements of these conditions as aforesaid on or before the date of completion of the works, NIA may at the expense of contractor arrange to remove scaffoldings, surplus materials and rubbish etc., as he thinks fit and the contractor shall have no claims in respect of any such scaffolding or surplus materials except for any sum actually realized by the sale there of less the cost offulfilling to requirements any other amount that may be due from the contractor. If the expense of fulfilling such requirements is more than the amount realized on such disposal as aforesaid the contractor shall forthwith on demand pay such excess.
4. The whole of the work including all extra and additional items if any and when ordered are to be completed inthe time stated in the contract and the contractor will be required if necessary to work overtime to stick to NIA requirements to complete all the works by the stipulated date. No extra claim for extension ofcompletion period will be allowed on account of this factor.
5. The completion period of the entire work as stated above shall be deemed to be the essence of the contract. Incase of delay in completing the work beyond the specified completion date the contractor will be required to pay a penalty at the rate of 0.5% of the total contract value per week subject to maximum of 5% of the actual cost of the project, there after the owner may get the work done at contractor's risk. The penalty will be recovered either from the contractor's bills or from the Security Deposit / Retention Money.
6. In case of delay of over 5 weeks in completion of the work beyond a stipulated completion date, NIA reservesthe right to terminate the contract and get all the jobs completed through another agency of its choice. Any extra expenditure that NIA will have to incur for completion of the balance jobs through another agency on account of higher rates quoted by the agency will be recovered from the contractor's Security Deposit, Retention Money and pending bills.

N. Extension of completion period

If the work is delayed by

1. Force Majeure
2. Serious loss or damage by fire or
3. Civil commotions, local combinations of workmen, strikes or lockout affecting any of the trades employedon the work, or
4. Delay on the part of other contractors or tradesman engaged by NIA in executing work not forming part ofcontract.
5. Non – availability of stores, which are the responsibility of NIA to supply.
6. Non-availability or breakdown of tools and plant to be supplied or supplied by NIA.

7. Request for extension of time to be eligible for considerations, shall be made by the contractor in writingwithin fourteen days of the happening of the event causing delay. The contractor may also if practicable,indicate in such a request the period for which extension is desired.
8. In any such case NIA may give a fair and reasonable extension of time for completion of work. Such extension shall be communicated to the Contractor by NIA in writing within one month of, the date ofreceipt of such request by NIA.

SITE FACILITIES

A. SETTING OUT OF WORK

1. The NIA / Project Architect shall supply dimensioned drawings levels and other information necessary to enable the Contractor to set out the works. The Contractor shall provide all setting out apparatus requiredand set out the works and be responsible for the accuracy of the same. He shall amend at his own cost and to the satisfaction of the NIA / Project Architect any error found at any stage which may arise thought inaccurate setting out unless such error(s) is / are based on incorrect data furnished in writing by NIA / Project Architect in which case the cost shall be on the account of NIA. The Contractor shall protect and preserve all bench marks liability period unless the NIA / Architect directs their removal.

B. SITE DRAINAGE:

1. All water which may accumulate on the site during the progress of works or in trenches and excavations from other than the expected risks shall be removed from the site to the satisfaction of the NIA / Architect at the Contractor's expenses.

C. NUISANCE

1. The contractor shall not at any time do cause or permit any nuisance on the site or do anything which shallcause unnecessary disturbance or inconvenience to others at or near the site of work.
2. The contractor shall all times give access to the staff of statutory bodies as well as other agencies associatedwith the project and shall provide them all facilities like scaffolding, water, lighting etc. at site for discharging their duties.
3. No residential accommodation provided to the workmen/labor at the site. NIA reserve the right for thesame
4. The Contractor shall provide at his cost all temporary lighting arrangement required for the works and toenable contractors and sub-contractors to complete the works in the specified time including that for theworkmen of any sub – contractors or special tradesmen.
5. NIA may provide **Electricity power on non-chargeable basis** for the works mentioned in the tender at onepoint. The necessary all electrification, wiring, lighting arrangement (including separate meter installation) shall be made available by the contractor and for which contractor shall not be paid any charges for the same. Misuse of electricity power shall be charged as 0.1% of contract value.

D. WATCHING AND LIGHTING:

1. The contractor shall provide and maintain at his own expense all lights, guards, fencing and watchingwhen and wherever necessary or required by the NIA / Project Architect for the protection of the works or for the safety and convenience of those employed on the works or the public.

E. EQUIPMENT & STAFF ASSISTANCE FROM THE CONTRACTOR

1. Theodolite, levels, plumb bobs, prismatic compass, chain, steel and metallic tapes and all other surveying instruments found necessary on the works shall be provided by the Contractor for the due performance of their contract as instructed by NIA. The NIA /Architect will use any or all measurementinstruments or tools belonging to the Contractor as and when he chooses for checking the complete works as well as the work in progress.
2. All scaffolding and ladders that may be necessary for taking measurement at site will be provided by theContractor.
3. The Contractor shall provide the following minimum equipment and machinery in good workingcondition at site during the entire period of construction/renovation as and when required.

F. The Contractor will be allowed to work for 8 (Eight) hours a day and 7 (Seven) days a week. However, no concreting shall be done during night or in the absence of the NIA / Architect. For workingbeyond normal working hours the Contractor shall obtain prior permission from the NIA /Architect.

EXECUTION

A. Admission to Site :

1. The Contractor shall not be permitted to enter on (other than for inspection purposes) or take possession of site until instructed to do so by the Architect / NIA in writing. The portions of the site to be occupied by the Contractor shall be defined and / or marked on the site plan failing which these shall be indicated by the NIA / Architect at site and the operations beyond the areas. In respect of any land permitted by NIA for the use of the Contractor for the purpose of or in connection with the contract. The same shall be subject to the following and such other terms and conditions as may be imposed by NIA.

2. The such use or occupations shall not confer any right of tenancy of the land to the contractor.

3. The Contractor shall have no right to put up any constructions of his own of any nature or type on NIA land except temporary constructions for storage of equipment for the work under the contract or as a resting place for labourers employed by him for the work provided that he obtained the requisite previous permission in writing from NIA or from the Architect in accordance with NIA procedure which permission they would be entitled to refuse in their absolute discretion. Such construction will be erected at the contractor's own cost.

4. If any electricity is used in any of such constructions the Contractor shall himself pay for the same. The Contractor shall at his own cost demolish all such constructions and remove the debris thereof, as also all his materials and equipment's and clean and level the site thereof before handing over the completed work to NIA.

5. The Contractor shall provide if necessary or if required on the site all temporary access thereof and shall alter adapt and maintain the same as required from time to time and shall take up and clear them away as and when no longer required and as and when ordered by the NIA / Architect and made good all damages done to the site. The Contractor shall note that the final bill will not be certified for the payment till the action as above is completed by the Contractor to the entire satisfaction of the NIA / Architect (Authorised official).

6. All the work shall be carried out as per detailed drawings and instructions of the Architect / NIA (Authorised official).

7. All drawings, tracings, photo prints and writings (except letter) shall be the sole property of Architect / NIA and must be returned to them on completion of the works.

8. The drawings maintained on the site are to be carefully mounted on boards of appropriates

size and covered with acoat of approved varnish. They are to be protected for ravages of termites, ants, silver fish and other insects.

9. The completion of the work may entail working in the monsoon also.

10. The contractor must maintain a minimum labour force as may be required for the job and plan and execute the construction and erection according to the prescribed schedule. No extra rate will be considered for such work inmonsoon.

11. During the execution of the work, Contractor must check his work with the drawings. The Contractor shall be responsible for all the errors in this connection and shall have to rectify all defects and / or error at his own cost,failing which NIA reserves the right to get the same rectified at the risk and cost of the Contractor.

B. MATERIAL TO BE PROVIDED BY THE CONTRACTOR.

1. The Contractor shall at his own expense and without delay supply to the NIA / Project Architect, samples of materials proposed to be used in the work. The NIA / / Project Architect shall within 15 days of supply of samples or within such period as he may require intimate to the Contractor in writing and inform the Contractor whether samples are approved by him or not. If the samples are not approved, the Contractor shall forthwith arrange to supply to the NIA / Project Architect for his approval fresh samples complying with the specification laid down in the contract. A set of all approved samples shall be maintained at site under lock& key by the Architect / NIA.
2. Architect / NIA shall have full power to require removal of any or all the materials brought to the site by the Contractor which are not in accordance with the contract specifications or do not confirm in character or quality to sample approved by him. In case of default on the part of the Contractor in removing rejected materials, the Architect / NIA shall be at liberty to have them removed by other means. The Architect / NIA shall have full power to procure other proper materials and in the event of the Contractor refusing to comply,he may cause the same to be supplied by other resources. All costs which may attend upon / incurred upon such removal and / or substitution shall be borne by the Contractor.
3. The Contractor shall indemnify NIA or any employee of NIA against any action, claim or proceeding relating toinfringement or use of any patent or design or any alleged patent design rights and shall pay any royalties orother charges which may be payable in respect of any articles or materials or part thereof included in the contract. In the event of any claim being made or action being brought against NIA or any agent, servant or employees of NIA in respect of any such matters as aforesaid the Contractor shall immediately be notified thereof.
4. NIA / Project Architect shall be entitled to have **tests carried out as specified in the contract for any materialssupplied by the Contractor**, other than those for which as stated above, satisfactory proof has already been furnished, at the cost of the Contractor and the Contractor shall provide at his expense all facilities which the NIA / Project Architect require for the purpose. IF no tests are specified in the contract and such tests are required for the purpose and the charges for these tests shall be borne by the Contractor only. The cost of materials consumed in the test shall be borne by the Contractor in all cases except when otherwise provided.

5. Representative of NIA connected with the contract, shall be entitled at any time to inspect and examine any materials intended to be used in or on the work, either on the site or at factory or workshop or at other place(s) manufactured or at any places where these are laying or from which these are being obtained and theContractor shall give such facilities as may be required for such inspection and examination.
6. Trees designated by the NIA / Project Architect shall be protected from damages during the course of the works and earth level within 1 meter of each such tree shall not be damaged, when necessary such treesshall be protected by providing temporary fencing.

C. LABOUR

1. The Contractor shall employ labour in sufficient number either directly or through sub – contractors when such subletting is permitted to maintain the required rate of progress and of quality to ensure workmanship of the degree specified in the contract and to the satisfaction of the NIA / Architect. The Contractor shall not employ in connection with the works any person who has not completed his Eighteenth year of age.
2. In case of any class of work for which there is no such specification supplied by NIA as is mentioned in thetender documents, such work shall be carried out in accordance with Indian Standard Specifications andif the Indian Standard Specifications do not cover the same the work should be carried out as per standard Engineering practice subject to the approval of the Architect /NIA.
3. The contractor shall on the written request of NIA / Architect immediately dismiss from the works any person employed by him therein who may in the opinion of NIA be incompetent or misconduct himselfand such person shall not again be employed on the works without the written permission of NIA/Architect(authorized official)
4. The Contractor or his agent shall be in **attendance at the site (s)** during all working hours and shall supervise / superintend the executions of works with such additional assistance in each trade as the NIA / Architect may consider necessary. Order given to the Contractor agent shall be considered to have thesame force as if they have been given to the Contractor himself.
5. Architect / NIA shall communicate or confirm his instructions to the Contractor in respect of the executions of work in a "**work site order book**" maintained in the office authorised representative shallconfirm receipt of such instructions by signing the relevant entries in the book.
6. Any instructions issued by the Architect / NIA orally, shall be of no immediate effect but shall be confirmed in writing by the Contractor to the site NIA / Architect within seven days and if not dissented from in writing by the Architect / NIA to the Contractor within 7 days from receipt contractor's confirmation shall take effect as from the expirationsofthelettersaid7daysofgivingsuchoralinstructionsshall himself confirm the same in writing, then the Contractor shall not be obliged to confirm as

aforesaid and the said instruction shall take effect as from the date of NIA / Architect confirmation and provided that if neither the Contractor nor the Architect / NIA shall confirm such oral instructions in the manner and at the time aforesaid but the Contractor shall nevertheless comply with the same then the Architect / NIA may confirm the same in writing at any time prior to the issue of the Final certificate and the said instructions shall thereupon be deemed to have taken effect on the date on which it was issued.

7. The Contractor shall provide and do everything necessary for the proper execution of the works accordingto the true intent and meaning of the drawings and specifications taken together, whether the same may or may not be particularly shown on the drawings, or described in the Schedule of Quantities, providedthat the same can be reasonably inferred therein from. Figured dimensions and all dimensions and particulars to be taken from the actual work.
8. The whole of the work must be proceed with such sections and at such times as directed by NIA
9. Architect / NIA (authorised official) may from time to time issue further drawings or written instructionswhich are hereafter collectively referred to as `Architect's Instructions' in regard to:
    i. The variation or modification of the design, quality or quantity of works or the addition oromission or substitution of any work.
    ii. Any discrepancy in the drawings or between the schedule of quantities and / or drawingsand / or specifications.
    iii. The removal from the site of any materials brought thereon by the contractor and thesubstitution of any material therefor.
    iv. The removal or re-execution or both of any works executed by the Contractor.
    v. The dismissal from the works of any persons employed thereupon.
    vi. The opening up for inspection of any work covered up.
    vii. The amending and making good of any defects of works improperly carried out.

10. The contractor shall forthwith comply with and execute any work comprised in such Architect's Instructions. Any instructions given verbally shall be deemed as instructions for the proper execution of the works as long asthey do not involve any extra charges.
11. If the Contractor after receipt of written notice form the Architect / NIA requiring compliance within seven days fails to comply with such drawings or Architect instructions or both as the NIA / Architect may issue,NIA may employ and pay other persons to execute any such drawings or Architect instructions and all cost incurred in connection therewith as certified by the Architect shall be borne by the Contractor or may be deducted from any amount due or that may become due to the contractor under the contract or may be recovered as a debt.

A. INSPECTIONS AND APPROVALS:

1. All works embracing more than one process shall be subject to examinations and approval at each stage thereof and the Contractor shall give due notice to the NIA / Project Architect shall be entitled to appraisethe quality and extended thereof.
2. No work shall be covered up or put out of view and without approval of Architect NIA or his authorized representative and the Contractor shall afford full opportunity for examination and measurement of any work which is about to be covered up or put out of view and for examination or foundations before permanent work is placed thereon. The Contractor shall give due notice to the NIA / Project Architect or his authorised representative wherever any such work or foundation is ready for examination and the NIA

   / Project Architect or his representative shall without unreasonable delay unless he considers it unnecessary and advises the Contractor accordingly attend for the purpose of examination and measuringsuch work or of examining such foundation he shall, if required by the NIA / Project Architect uncover such work at the Contractor's expenses.
3. Duties and powers of NIA / Project Architect and his authorised representative and other officers of NIA. The duties of the representative of the NIA / Project Architect are to watch and supervise the progress of works and to test and examine any materials to be used or workmanship employed in connection with theworks. They shall have no authority to order any work involving any extra payment by NIA or to make any variations in the works except when authorised by the NIA. The NIA / Architect may from time to time in writing delegate to his representative any of the powers and authorities vested in him and shall furnishes to the contractor a copy of all such written delegation of powers and authorities. Any written instructions of written approval given by the representative of NIA / Architect to the Contractor within terms of such delegations shall bind the Contractor and NIA as though it had been given by the NIA / Architect.
4. Failure of the representative of Architect to disapprove any work or materials shall not prejudice the power of the NIA / Architect thereafter to disapprove such work or material and to order pulling downremoval or breaking up thereof.
5. If the Contractor shall be dissatisfied with any decisions of the representative of the

Architect / NIA he shall be entitled to refer the matter to the Architect / NIA who shall thereupon confirm, reverse or vary such decisions.

6. The whole of the materials (except where otherwise described), stores and equipment required for the faithful performance of the contract must be provided through normal trade channel, and must be the best of their kind available at the time and the Contractor must be responsible for the proper and efficient carrying out of the work. The work must be done in best and most workmanlike manner. Samples of all materials to be used must be submitted to the Architect / NIA on the site for approval prior to procurement. The Contractor shall furnish to the Architect / NIA for approval when requested or if required by the specifications, adequate samples of all materials and finished to be used in the work. Such samples shall be submitted before the work is commenced and in ample time to permit tests and examinations thereof. All materials finished and applied in actual work shall be fully equal to the approved samples.
7. During inclement weather the Contractor shall suspend concreting and plastering for such time as the Architect / NIA may direct and shall protect from injury all works in the course of erection.
8. Should the work be suspended by reason of rain, strike, lockouts or other cause the Contractor shall take all precautions necessary for the protection of the work and at his own expense shall make good any damages arising from any of these causes.
9. The Contractor shall keep accurate records of weather, temperature, visitors and any other occurrences affecting the progress or quality of the works.
10. All shavings, cuttings and other rubbish as it accumulates from time to time during the progress of the works and at completion including that of sub – Contractor and specific tradesman to be cleared and carted away and all materials condemned by the Architect / NIA shall be removed from site as and when required during the entire duration of the work at no extra cost.
11. The Contractor shall protect all projecting cills and mouldings and all concrete steps from injury during the progress of the work by rough timber casings securely fixed.
12. The Contractor shall provide all necessary templates, moulds for circular or shaped work, carpenters or joiners work or any other trade.

13. The Contractor shall protect joinery and make good all damages to the same from any cause whatsoever during the performance of the contract and leave perfect to the satisfaction of the Architect / NIA at thetime of completion. Before giving up possession, the contractor must see that all doors sashes etc. workeasily and shall make all necessary adjustments.
14. The Contractor shall provide suitable stone with flat tops and build the same in concrete for temporary bench marks. All the pegs for setting out the work and fixing the necessary levels required for the execution thereof shall if desired by the Architect / NIA likewise be built in masonry at such places and insuch manner as NIA may determine.
15. Particular care must be taken to see that the floors are not overloaded by stacks of materials during construction. It is important that no load comes on the reinforced concrete floors until they are at least 3weeks old and at no time must the load placed upon them exceed the load for which they are designed
16. The Contractor has to provide all necessary holes, slits and depression etc. in form work and concrete toplace pipelines or ancillary services in any form as shown in the drawings or as directed by NIA
17. The Contractor shall cover up and protect from injury from any cause all new work also for supplying all temporary doors, protection to windows and any other requisite protection for the whole of the works executed whether by himself or specified tradesmen or sub contractors and any damage caused must bemade good by the contractors at his own expenses.
18. The Contractor shall provided temporary teakwood barricading upto 4' 0" height from the floor level to all lift walls and / or shafts opening on all floors to safeguard against any accidental fall and maintain them till such time as permanent enclosures are installed. No extra payment will be allowed on the contractsum for complying with this clause.

D. STATUTORY

1. The contractor shall conform to the provisions of any regulations and by – laws of any water or lighting companies with whose system the structures are proposed to be connected and shall before making any variations from the drawings that may be necessitated by so conforming give to the Architect / NIA on site written notice specifying the variations proposed to be made and the reason for making to and apply for instructions thereon. In case the contractor shall in due course receive instructions, he

shall proceed with the work, conforming to the provision regulations or by-laws to the supply companies and shall provide forand pay all fees and charges.

2. The contractor will be fully responsible for complying with all relevant provisions of the Contractor LabourAct and shall pay rates of Wages and observe hours of work/ conditions of employment according to the rules in force from time to time.
3. The contractor shall comply with provisions of payment as per the following acts : Payment of wages Act,1936, Workmen's Compensation Act,1923 Industrial Dispute Act, 1947Minimum Wages Act, 1948Employees State Insurance Act, 1948 Maternity Benefit Act, 1961, Mines Act, 1952 or

   Any amendments / modifications thereof or any other law relating thereto and rules made there under fromtime to time. NIA / Architect shall on a report having being made by an inspecting office as defined in the contract labour regulations have the power to deduct from the money due to the Contractor any sum required or estimated to be required for making good the loss suffered by a worker (s) by reasons of no – fulfillment of conditions of contract for the benefit of workers no – payment of wages or of deductions made from his or their wages which are not justified by the terms of contract or non observance of the saidcontractor's labour Regulation.
4. The contractor shall pay to labour employed by him, and in the case of his giving any part of the work on sub

   – contract he shall ensure and be responsible to see that the sub – contractor pays to labour employed by such contractor, wages not less than wage or remuneration as provided in the contract labour (Regulationsand Abolition Act) and in the Rules, Regulations andorders.
5. The Contractor shall indemnify the NIA against any payments to be made under and for observance of theRegulations aforesaid without prejudice to his rights to claim indemnity from his sub - contractor.

E. SAFETY CODE:

1. The Contractor shall at his own expenses arrange for the Safety provisions as amended to these conditions or as required by the NIA / Architect in respect of all labours directly or indirectly employedfor performance of the works and shall provide all facilities in connections therewith. In case the contractor fails to make arrangements and provide necessary facilities as aforesaid, the NIA / Architectshall be entitled to do so and recover the cost thereof from the Contractor. Safety precaution to be takenin all respects (till completion of works) including for all concern human being. The contractor shall be responsible for any damage or loss of part / limb or death human

being.

2. From the commencement to the completion of the works, the contractor shall take full responsibility for the care thereof and of all the temporary works (defined as meaning all temporary works of every kind required in or for the execution, completion or maintenance of the works). In case damage, loss or injury shall happen to the works or to any part thereof or to temporary works or to any cause whatsoever (save except the Expected Risks as defined in) repair at his (Contractor's) own cost and make good the same sothat at the time of completion, the works shall be in good order and condition and in conformity in every respect with the requirements of the contract and NIA instructions. In the event of any such damage, loss or injury happening from any of the Expected Risks the contractor shall if any to the extent required by NIA repair and make good the same as aforesaid at the cost of NIA.

F. INSURANCES

1. The Insurance for the following will be covered and paid for by the contractor, and contractor shall indemnify the NIA and hold the NIA harmless in respect of all and any expenses arising from any suchinjury and / or damages in respect of:

    a. Workmen's Compensation and Risk of Accidents to contractor's own employees.
    b. Contractors all risk Insurance to cover the total cost of project with third party coverage.

2. The contractor has to insured building/site under construction/renovation till completion and it should beplace to be employer in the name of the NIA. Contractor shall submit the copy of policy details within 15 days of receipt of LOI/Work order.
3. If the contractor and / or his sub contractor fails to effect and keep in force the Insurance referred to above or else where in the contract or any other insurance which he may be required to effect and keep in force, NIA reserves the right to keep in force and such insurances and pay such premium or premia as may be necessary for the purpose and from time to time deduct the amount so paid by NIA as aforesaidfrom any moneys due or which becomes due to the contractor or recover the same as a debt from the contractor.

4. The aforesaid insurance policy / policies shall not be cancelled till the Architect / NIA has agreed to their cancellation.

5. The Contractor shall prove to the Architect / NIA from time to time that he has taken out all insurance policies referred to above and has paid the necessary premium for keeping the policies alive till the expiryof the defects liability period.
6. The contractor shall ensure that similar insurance policies are taken out by his sub–contractor (if any) andshall be responsible for any claims of losses to NIA resulting from their failure to obtain adequate insurance protections in connection thereof. The contractor shall produce or cause to be produced by his sub – contractor (if – any) as the

case may be, the relevant policy or policies and premium receipts as andwhen required by the Architect /NIA.

G. NOTICE TO LOCAL BODIES.

1. The contractor shall comply with and give all notices required under any Government authority, instrument, rule or order made under any act of parliament, state laws or any regulations or by-laws of anylocal authority relating to the works. He shall before making any variations from the contract drawings necessitated by such compliance give to the NIA / Architect a written notice giving reasons for the proposed variations and obtain the Architect instruction therein.

H. ARBITRATION

1. All disputes or differences of any kind whatsoever which shall at any time arise the parties hereto touchingthem or concerning the work or execution or maintenance thereof this Contract or the construction operation or effect thereof or to the rights or liabilities of the parties or arising out of or in relation thereto whether during or after determination, foreclosure or breach of this contract (other than those inrespect of which the decision of any person is by the contract expressed to be final and binding) shall after written notice by either party to the contract or the other of them and to the Appointing Authority who shall be appointed for this purpose by the Employer, be referred for adjudication to a sole arbitrator to be appointed as here in after provided.

2. For the purpose of appointing the sole Arbitrator referred to above, the Appointing Authority will send within thirty days of receipt by him of the written notice aforesaid to the Contractor, a panel of the threenames of persons who shall be presently unconnected with the organization for which the work is executed.
3. The Contractor shall on receipt by him of the names as aforesaid, select any one of the persons named to be appointed as a sole Arbitrator and communicate his name to the Appointing Authority within thirty days of receipt by his the names. The Appointing Authority shall thereupon without any delay appoint thesaid person as the sole Arbitrator, if the Contractor fails to communicate such selections as provided above within the period specified, the appointing authority shall made the selection and appoint the selected person as the sole Arbitrator.
4. If the appointing Authority fails to send the Contractor the panel of three names as aforesaid within the period specified, the Contractor shall send the Appointing Authority a panel of three names of personswho shall be unconnected with either party. The Appointing Authority shall on receipt by him of the names as aforesaid select any one of the persons named and appoint him as a sole Arbitrator. If the Appointing Authority fails to select the person and appoint him as the sole Arbitrator within 30 days of receipt by him of the panel and inform the Contractor accordingly,

the Contractor shall be entitled to appoint one of the person from the panel as a sole arbitrator and communicate his name to the Appointing Authority.

5. If the Arbitrator so appointed is unable or unwilling to act or resign his appointment or vacate his office due to any reason whatsoever another sole arbitrator shall be appointed as aforesaid.
6. The work under the Contract shall, however continue during the Arbitration proceeding and no payment due or payable to the Contractor shall be withheld notice on account of such proceedings.
7. The Arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties fixing the date of the first hearing.
8. The Arbitrator may from time to time, with the consent of the parties, enlarge the time for making and publishing the Award.
9. The Arbitrator shall give a separate award in respect of each dispute in accordance with the terms of the Contract and give a reasonable award.
10. It is also a term of the Contract that if Contractor (s) do/does not make any demand for arbitration in respect from the Clients / Architects that the bill after due verification is passed for payment of a lesser amount, or otherwise, the arbitration shall be deemed to have been forfeited and Client / Architects shall be relieved and discharged of their liability under this agreement in respect of such claim(s). Further, it is agreed that for the purpose of this clause such notice is deemed to have been received by the Contractor(s) within 2 days of posting of the letter by Clients / Architects or when delivered by hand immediately after receipt thereof by the Contractor(s), whichever is earlier. Further, a letter signed by
the officials of Clients / Architects that the letter was so posted to the Contractor(s) shall be conclusive.
11. The Fees, if any of the Arbitrator shall, if required be paid before the award, be paid half and half by each of the parties. The costs of the reference and of the award including the fees, if any of the Arbitrator who may direct to and by whom and in what manner, such costs or any part thereof shall be paid and may fix of settle the amount of costs to be so paid.
12. The award of the Arbitrator shall be final and binding on both the parties.
13. Subject to a fore said, the provisions of the Arbitration and Conciliation Act 1996, or any statutory modification of re- enchantment there of and the rules made there under, and for the time being in force, shall apply to the Arbitration proceeding under this Clause.

SPECIAL CONDITIONS OF CONTRACT

1. It shall be distinctly understood that notwithstanding the reviews and suggestion if any, by the NIA or Project Architect the sole and ultimate responsibility for the stability and performance of the form workand staging and all other temporary works shall be that of the Contractor.
2. The partners or Directors of the Contractor shall meet the officers of NIA or its consultants at the site ofworks or at their respective offices whenever requested to do so.
3. The Project Architect shall supply to the contractor reasonably complete engineering drawings. All **the drawings required for the complete execution** of the work shall be submitted by the Architect within 7 days of issue of work order. **Bar bending schedules and shop drawings** required for proper execution ofwork shall be prepared by the Contractor and submitted well in advance within 14 days of issue of work order to NIA and its Project Architect to permit scrutiny, corrections resubmissions and final approval without causing any delay in the construction/renovation work.
4. The Contractor shall confirm to the provisions of the Government Act relating to the work, and to the regulations and bye-laws of the local authorities. The contractor shall give all notices required by the said act, and obtain all required permission and license and pay all fees payable to such authorities in connection with constructing and maintaining temporary electric and water supply at site for the said project. All aspects of temporary works including their stability shall be the sole and ultimate responsibility of the Contractor.
5. NIA reserves the right to use the premises and any portion of site for execution of any work not includedin this contract which NIA may desire to get executed by other agencies. The Contractor shall allow all reasonable facilities for the execution of such work but shall not be required to provide any plant or material for such work except by special arrangement with NIA in such a manner as not to impede the progress of the works included in this contract and the Contractor shall not be responsible for any damage or delay which may happen or be occasioned by such work.
    i. In addition to previous stipulations, the Contractor shall be represented at site at all times duringthe tenure of the contract by responsible and qualified engineers approved by NIA Such
    engineer shall form the Contractor's Project Management & Site Supervisory Team. They shallbe in constant attendance upon all activities of the work. Contractors staff shall comprise of atleast the following to be permanently on site for the entire duration of the project.

        1. Engineer (Diploma holder with at least 7years' civil and interior works experience) – 1person.

2. Jr. Engineer(Min. 5years' experience having Diploma Holder civil and interior worksexperience) – 1persons.

ii. Cost of recovery against materials, utilities or services supplied or arranged for by NIA shall bemade by deducting the respective amount from the running as well as final bills.

6. Although Schedule of Probable Quantities & Rates has been divided into various sub – section, the ratesquoted for a particular item of work in one sub – section shall be made applicable to similar item of work in any other sub – section if that item is not listed in the Schedule of that other sub –section.
7. This project is subjected to inspection by various audit / vigilance agencies of Government of India / NIA if any inspection of works is carried out by such agencies contractor shall extend his full co- operation to these agencies in examining records, works etc. on inspection by such agencies, any and intheir inspection report, if it is pointed out that Contractor has not carried out work according to guideline laid down in this tender documents and also if any recoveries in some items is pointed out
therein, same shall be recovered from contractor's R. A. Bills / Final Bill. The items under dispute shallnot be paid in full till inspection agency gives their no objection report.
8. This work being prestigious NIA, quality of materials & workmanship are expected from the contractor ofvery high standard.
9. The successful tenderer is bound to carry out any item of work up to any deviation in quantities, for thecompletion of the job.
10. The Electrical works is to be executed through licensee electrical contractor only.
11. Material testing report can be asked for by NIA. The contractor must cooperate with the employer (NIA) tomake available such reports from the manufacturer of the material used in the tender with no extra cost.
12. NIA shall be the sole deciding authority on the brand and make of the materials to be used.

SCHEDULE – F

1	• Earnest Money Deposit	:	**Rs. 1,80,000/-**
2	• Initial Security Deposit	:	2% of the total tendered amount (for successful bidder)
3	• Defects Liability Period (DLP)	:	12 months from the date of issue of virtual completioncertificate and handing over the completed work to owners
4	• Period of commencement	:	7 days from the date of letter of intent / work order
5	• Duration of completion of work	:	**8 Weeks**
6	• Liquidated damages at the rate	:	0.5% of total contract value per week up of to maximum of5% of the contract value, there after the owner may get the work done at contractor's risk and cost i.e. beyonddelay of 5 weeks
7	• Retention money	:	a) 7% retention money to be kept from every running bill -to be released after completion of DLP
		:	b) Security deposit to be released on expiry of the defectsliability period after rectification in executed works.
8	• Terms of rate	:	The rates shall be at site of work and Should be excludingof GST
	• Period of validity of tender		120 days from opening of tender
	• Period for honouring interim bill		The interim bills if raised shall be paid within 15 workingdays of receipt from the architect)
	• Validity of rates after award of work	:	The rates shall be firm for period of 5 Months from the date of award of work or till final completion of work whichever is later. **"NO ESCALATION IN PRICES WILL BE ALLOWED"**
	• Minimum value of work of Interim bill	:	**Only one bill of full contract value**

1. Upon it becoming reasonably apparent that the work is delayed, the contractor shall forthwith give written notice of the cause of the delay to the client and the Architect. Then the client and the Architect shall as soonas they are able to estimate the length of the delay beyond the date or time aforesaid, make in writing a fair and reasonable extension of time for completion of the work, provided always that the contractor shall use constantly his best endeavour to prevent delay and shall do all that may reasonably be required to the satisfaction of the client and the Architect to proceed with work.
2. **Damage for non-completion:**If the contractor fails to complete the works by the date specified in the conditionsor within any extended time fixed, the contractor shall pay to NIA a sum calculated at the rate stated in the special conditions as agreed liquidated damages for the period during which the said work shall so remain or have remained incomplete. The client may deduct such damages from any money that is otherwise payable to the contractor, under this contract.
3. **Extra Items :** All authorised extra items where rates cannot be derived from tender the contractor shall submitrates, supported by rate analysis worked on the 'actual cost basis' plus 15% towards establishment charges, contractor's overhead and profit & GST etc
4. **Deviation in Quantities:** There is no variation limit in tender quantity, for any variation in plus or minus,contractor is supposed to execute the same at quoted rates.
5. **Photographs :**The rate quoted shall include the cost of supplying colour photographs of 8" x 10" size including soft copy to employer after completion of work from various angle one set each to Employer and the architectseparately in respect of each floor/dept as directed.

GENERAL SPECIFICATION

This specification are for the work to be executed items to be supplied and materials to be used in the works as shown and deafened on the drawings and described here in all under the supervision and to the satisfaction of the Architect /Employer.
The workmanship is to be the best available and of a high standard. Use must be made of specialist tradesmen in all aspects of the works, and allowance must be made in the rates for doing so.
The materials and items to be provided by the contractor shall be the best of their respective kinds, approved by the architect in accordance with any samples which may be submitted for approval and generally in accordance with the specifications. Where materials or products are specified in this specification and or / bill of quantities by the name of the manufacture or the brand trade name or catalogue reference the contractor will be required to obtained the approval of the architect / employer before using a material or product other than the specified. The contractor shall produce all invoices, vouchers or receipted accounts for any materials if called upon to do so by the Architect.
Sample of all material are to be submitted to the architect for his approval **within 10 days ofissue of work order** before the contractor orders or delivers in bulk to the site. Also, the contractor will be required to submit specimen finishers of colors, fabrics etc. for the approval of the architect before proceeding with the works. Should it be necessary to prepare shop drawings, then four copies of such drawings shall be submitted for the approval of the architect who will retain ONE copes all at the contractors expenses.

TIMBER:

Timber generally is to be best of its kind, well and properly seasoned, of mature growth, free from worm holes large loose or dead notes or other defects and sawn die square and will not suffer warping, splitting or other defects through improper handling.
The hardwood is to be C.P.teak weighing not lessthen45lbscubicfoot with a moisture content tax. Timber is to be out to the required sizes and length as soon as practicable after the works arebegun and stored under cover so that the air will circulate freely around it. Journey is to beprepared, immediately after the placing of contract, framed up (but not bonded) and stored untilrequired for fixing in position, when it is to be bonded and waged up. Any portions that warp ordevelop shakes or other defects are to be replaced before wedging up, the whole of the work is tobe framed and finished in a proper and workman like manner in accordance with the detaileddrawings and fitted

with all necessary motaties straps, belts screws etc. running bonded jointsare to be cross tongued with teak on guess and where over 1 – 1/28 thick double tongued. Joiner's work generally unless otherwise specified. Templates boxes and moulds shall beaccurately set out and rigidly constructed so as to remain accurate during the time they are in use.
Grounds are to be clean shown, free large knots, splayed as required, plugged and fixed to walls etc. at 1'6" centers.
Wood plugs are to be cut on the twist, patent wall plugs or plastic filling may be used in lieu of wood plugs with the approval of the Architect.
All unexposed surfaces of timber e.g. false ceilings, backings fillets backs of doors frames, cupboard framing, grounds etc. are to be treated withONE coats of approved timber preservative like solignim, kirticite, term seal or cast oral or vacuum pressure impregnated withand approved water soluble timber preservative before fixing or bedding.
The quality of timber shall be checked and ensured by the Architect.

JOINTS:

All joints will be standard, mortised and tenon, dovetail, dowe, cross halved, metered tongued and grooved and rebated, nailed or glued but joints, will not be permitted except in exceptional cases, ailed but joints will not be accepted. All joins shall be smeared with white lead.
Whenever solid wood is specified it shall be as per I.S.I. and of good quality. The type of wood shall be got approved before collecting the same on site. Fabrication of wooden members shall be started only after approval. It shall be free from large, loose, dead of cluster knots, flows, shakes, warps, bends or any other defect. It shall be uniform in substance and of straight fibers asfar as possible. It shall free from rats, decay, harmful fungi and other dejects of its usefulness for the purpose for which it is required. The colour of wood shall be uniform as far as possible. The scantlings planks etc. shall be seen in straight lines and planes in the direction of grain and of uniform thickness.

FIRST CLASS TEAK WOOD:

First class teak wood shall have no individual hard and sound knots, more than 6 sq.cm. in size and the aggregate area of such knots shall not more than 1% area of piece. The timber shall be closedgrained.

SECOND CLASS TEAK WOOD:

No individual hard and knot's shall be more than 15 sq.cm. in size and aggregate area of suchknot's shall not exceed 2% of the area of piece.

GLASS:

All glass shall be of the best quality, free from specks, bubbles, smokes, veins, air holes, blisters and other defects. The kind of glass to be used shall be as mentioned in the item or specification or in the special provisions or as shown in detailed drawings. Thickness of glass panel shall be uniform. All glass to be approved manufacture complying with IS:3548-196 or as per approved quality and sample.
The compound for glazing to metal is to be special non hardening compound manufacture forthe purpose and of 9 brand and quality approved the interior Designer.
In cutting glass, proper allowance shall be made for expansion. Each square of glazing to be in one whole sheet and after cutting the edges to be properly filled On completion, clean all glass inside and out, replace all cracked scratched or broken panes and leave in good condition to the satisfaction of the Architect.

Only etching is to be used on glass panels. No frosting shall be used.

MELAMINE FACED PARTICAL BOARD:

It should be three layered wood based particle board, such as Nova pan melamine faced pre- laminated on both sides. Particle board should be ISI 3087 FPTH (type II, 1965) marked on edges and should also confirm to German din standard Viz DIN 66761. It should impart good bending strength, modules of elasticity, internal bond strength and screw holding strength.
Melamine faced

surface should has resistant to crack at 100 and should pass cigarette burn test.

POLISH:
The wooden article to be polished shall be first prepared to smooth surface with 400 fit black water proof sand paper. All dents shall be filled with epoxy putty and to be finally finished with DUCO, N.C. clear lacquer to a silk smooth finish.

PLYWOOD:

Plywood for general purpose shall confirm I.S.I. 303-1975.

FASTENINGS AND HARDWARE:

1. THE fixtures and fastenings, that is, but hinges, teemed strap hinges, sliding door stoppers, casement window fasteners, casement stays and ventilators catch shall be madeof the metal as specified in the item orits specifications.
2. They shall be of iron, brass, aluminum, chromium plated iron, and chromium plated brass copper oxidized iron copper oxidized brass or anodized aluminum a sspecified.
3. The fixtures shall be heavy type. The fixtures and fastenings shall be smooth finishedand shall be such as will ensure case of operation.
4. The samples of fixtures and fastenings shall be got approved as regards quality andshape before providing them imposition.
5. Brass and anodized aluminum fixtures and fastenings shall be bright finished.
6. Screws, nails, bolts, will be of brass or other non-corrosive metal.In hardware, they will matchthe finish of the hardware item.
7. Nails, in a finished surface shall be neatly punched and the hole filled with wood fillermatching the finish. Screws, in a finished surface will be round head, raised head or sunk beneath the surfaces and the hole plugged with a wood plug with matching colorand grain of the wood surface, unless especially detailed.

HARDWARE:

Hinges, locks, latches, door tracks etc. shall be as specified by the manufacture specified. In any variation of this quality of the substitute shall be equal to or better than the original specified, and samples should be submitted to the Architect for prior approval.

HARDWARE AND METALS:

The hardware throughout shall be of approved manufacture and supply well made and equal in every respect to the samples to be deposited with the Architect. The contractor any be required toproduce and provided samples from many different sources before the Architect is able to makea decision and he should allow in his rates for so doing.
Fittings generally shall have a satin chrome or anodized finish unless otherwise specified, andshall be suitable for their intended purposes.
Screws are to match the finish of the article to be fixed and to be rounded of flat headed orcounter sunk as required.
Cover up and protect at the brass and bronze surfaces with a thick grease or other suitableprotective material, renew as necessary and subsequently clean off and clearway
On completion. Aluminum and stainless steel shall be of approved manufacture and suitable for its particular application. Generally the surfaces of aluminum shall have an anodized finish and both shallcomply with the samples approved the Architect. All steel brass, bronze, aluminum and stainless steel articles shall be submitted to a seasonable test for strength; if so

required by the Architect at the Contractor's expenses.
All brazing and welds are to be executed in a clean and smooth manner rubbed down and left inthe flat test and tidiest way, particularly where exposed.
Chromium plated shall be in accordance with B.S. 1224 or as per approved specification andshall be on a base materials of copper or brass or as specified by Architect.

ENAMEL PAINTS:

Oil paints shall be of 1st quality and the specified colour and shade, and as approved. The easy mixed paints shall only be used. However, if ready mixed paint of specified shade or tint is not available whileready mixed paint with approved strainer will be allowed. In such a case, the contractor shall ensure thatthe shade of the paint so allowed shall be uniform.
All the paints shall meet with the following general requirements:

1. Paint shall not show excessive setting in a freshly opened full can and shall easily be re-disbursed with a paddle to a smooth homogeneous stage. The paint shall show no curdling, levering, caking or color separation and shall be free from lumps and skins
2. Paint as received shall brush easily, possess good leveling properties and show norunning or slugging tendencies.
3. The paint shall not skin within 49 hours in a three quarters filled closed container.
4. The paint shall dry to a smooth uniform finish from the manufactures and generallyaccording to their instructions and without any admixtures what so ever.

Ready mixed paint shall be used exactly as received from the manufactures and generallyaccording to their instructions and without any admixtures what so ever.

PLASTIC EMULSIONPAINT:

Pigmented priming coat (emulsion thinned with water) followed by three or more finishing coats of plastic emulsion paint. Pasted filler to be applied every coat exempting the final finishing coatandsanded.
Company name: ASIAN PAINTS
Shade No. ROYAL ATMOS White – for wallsShade No. ROYAL ATMOS White – for ceilings
Shade No. Plastic Emulsion White – for Utility area like kitchen, toilet.

LAMINATES:

All the laminate to be used shall be of 1.0 / 1.5 mm. thickness in approved the color and shadeas proved and specified by the Architect. It shall be as given below.

VENEERS:
The best quality natural wood veneers of the specified wood and of the specified thickness shall be used. It shall be in matching group and of uniform shade and as per the selection and approval. The contractor shall have to obtained the approval of the prior to pressing of veneers. The contractor shall have to use the brand of veneers as approved bythe Architect.

RUBBER:

Natural latex rubber (Geo foam) of specified density and the thickness shall be used for all the cushions and padding for upholstered furniture. Loose cushions of all furniture should have solidfoam walling to keep up proper shape.

UPHOLSTERY:

This will be of first class standard workmanship with webbing no- sag springs, padding and filling as specified on drawing. Covering fabrics will be shown tufted and corded as shown on the drawing.

CUSHION VENTS:

Brass or aluminum "cushion vents" should be installed at the back or underside of seat cushions (especially) those covered in leather evenly plastic or very tightly woven fabric) to allow air to escape and to prevent torn seams.

LIST OF INDIAN STANDARDS REFERRED

01. **IS NO.1200**
Latest measurement of building, civil engineering works, methods of measurements

02. **IS NO.287-1973**
Recommendation for maximum permissible moisture content of Timber used for different purposes in different climate zones.

03. **I.S. NO. 1141 - 1973**
Code of practice for seasoning to timber

04. **I.S. NO. 6534-1971**
Code of practice for seasoning to timber

05. **I.S. NO. 1200 (Part XXI) – 1973**
Method of measurement of building and civil Engineering Fart wood work and joinery

06. **I.S NO. 3945 - 1966**
Code of practice for joints used in wooden furniture

07. **I.S NO. 4020 - 1967**
Wooden flush doors – typical method of test for

08. **I.S. NO. 4970 - 1973**
Key for identification of commercial timber

09. **I.S. NO. P40 3364 (Part 11) - 1976**
Methods of measurement and evaluation of defects in timber, part 11 – converted timber

10. **I.S. NO. 1708- 1969**
Methods of Testing small clear specimens of Timber.

11. **I.S. NO. 6342 1971**
Rosewood logs for production of sliced veneers

12. **I.S. NO. 5348 - 1969**
Teak logs for production of sliced veneers

13. **I.S. NO. 2202 (Part 1) - 1973**
Specification for wooden flush door shutters (solid core type Part I – plywood panel)

14. **I.S. NO. 2338 (Part 1) – 1967**
Code of practice for finishing of wood and wood base Part I – operations and workmanship

15. **I.S. NO. 7638 - 1975**
Methods of sampling of plywood

16. **I.S. NO. 303 - 1975**
Specification for plywood for general purposes

17. **I.S. NO. 3129 - 1965**

Specification for particular board for insulation purposes

18. **I.S. NO. 3513 (Part III & Part IV) - 1966**
High & medium density wood based purpose

19. **I.S. NO. 40. 1659 - 1979**
Block boards

20. **I.S. NO. 7316 - 1974**
Decorative Plywood using plurality of veneers for decorative faces

21. **I.S. NO. 1734 – 1966**
High density wood particle board

22. **I.S. NO. 1734 (Part I to XX)**
Plywood method of Test for
Part I - General
Part II - Plywood
Part – III - Battens

23. **I.S. NO. 1328 - 1970**
Veneer decorative plywood

24. **I.S. NO. 710** – Marine Ply

25. **I.S. NO. 3087 - 1969**
Wood particle boards (Medium density)

26. **I.S. NO. 848 - 1974**
Specification for synthetic resin adhesives for plywood
(Phenolic & Aminoplastic)

27. **I.S. NO. 8273 - 1976**
Fibrous gypsum plaster boards

28. **I.S. NO. 2095 1965**
Gypsum plaster boards

29. **I.S. NO. 2542 (Part I) - 1976**
Gypsum Plaster concrete and products methods of Test for Part 1 – Plaster end concrete

30. **I.S. NO. 8272 - 1976**
Gypsum plaster for use in that Manufacture of fibrous plaster boards

31. **I.S. NO. 2441 - 1963**
Fixing ceiling coverings, Code of practice for

32. **I.S. NO. 2933 - 1977**
Specification for flat transparent shift glass

33. **I.S. NO. 2395 (Part I – 1966 & Part II – 1967)**
Painting of concrete masonary, plaster surfaces – code of practice for Part – I – operation and workmanship, Part – II - Schedule

34. **I.S. NO. 3548 – 1966** – Glazing in building – code of practice for

35. **I.S. NO. 6228 - 1971**
White washing & color washing, code of practice for

36. **I.S. NO. 137 - 1965**
Specification for ready mixed paint, brushing, matt or egg-shell flat finishing interior to Indian standard color, as required

37. **I.S. NO. 113 - 1965**
Specification for ready mixed paint, brushing, matt or egg-shell flat finishing interior to Indian standard color, as required

38. **I.S. NO. 129 - 1950**
Specification for enamel, interior (a) under coating (b) finishing

39. **I.S. NO. 129 - 1950**
Specification for ready mixed paint brushing, gray filler for enamel for use over primers

40. **I.S. NO. 12- - 1950**
Specification for ready mixed paint brushing, finishing, interior, oil, glass for general purposes Indian Standard colors

41. **I.S. NO. 3 - 1973**
Specification for gum spirit of turpentine (oil of turpentine)

42. **I.S. NO. 101 – 1964 –** Method of tests for ready mixed paints & enamels

43. **I.S. NO. 75 - 1973**
Specification for Linseed oil and refined

44. **I.S. NO. 77 - 1976**
Specification for Linseed Oil, boiled for paint

45. **I.S. NO. 124 – (Part I) - 1976**
Specification for ready mixed paint, brushing, finishing, semi-glossy for general purposes

46. **I.S. NO. 5884**
Specification for wooden carpets

47. **I.S. NO. 109-1979**
Specification for ready mixed paint, brushing, Zinc chromate primer

48. **I.S. NO. 5391 – 1969 –** Adjustable metal chairs for use of typist and operators in telephone exchange

49. **I.S. NO. 8756 – 1978 –** Ball catches for use in wooden furniture

50. **I.S. NO. 3499 – 1976** (Part II) chairs for office purpose metal -

51. **I.S. NO. 5416 – 1969 –** General purpose wooden chairs, methods of test for

52. **S. NO. 6185 - 1971**
High Chairs – Specification & safety requirements for

53. **S. NO. 4116 - 1976**
Joints used in wooden furniture – Code of practice for

54. **S. NO. 3845 - 1966**
Joints used in wooden furniture – Code of practice for

55. **S. NO. 7070 - 1973**
Shelving racks – wooden (adjustable & adjustable type)

56. **I.S. NO. 1414 - 1977**
Table Tops (wooden)

57. **I.S. NO. 5967 - 1969**
Tables, wooden of test for

58. **I.S. NO. 3564 - 1975**
Door closures (hydraulically regulated)

59. **I.S. NO. 799 - 1979**
Drawer locks, cupboards & box locks

60. **I.S. NO. 7981 (Part I) - 1975**
Glossary for terms relating to builders hardware – Part I - locks

61. **I.S. NO. 704 (Part I – II) - 1976**
Tower bolts ferrous metals & nonferrous metals

62. **I.S. NO. 401**
Approved wood preservative

N.B.: - Various items to be used in the Interior decoration work shall be to ISI standards. Wherever the items / products do not have ISI mark / standard, these shall be got tested for their quality etc. at the approved laboratory and necessary testing charges shall be borne by the contractor.

The above list is only for guideline of the tenderer. Any Amendment / addition / deletion / substitution made by the Bureau of Indian standards as on date will have to be take consideration while executing the items.

PLASTIC EMULSION PAINT

Plastic emulsion paint (IS 428) of approved brand and manufacture shall be used. The primer, where used as on new work shall be cement primer or distemper primer as described in the item. These shall be of the same manufacture as Plastic Emulsion. The distemper shall be diluted with water or any other prescribed thinner in a manner recommended by the manufacturer. Only sufficient quantity of distemper required for day's work should be prepared.

The contractor in sealed tins shall bring the Plastic Emulsion and primer and sufficient quantities at a time suffice for a fortnight's work, and the same shall be kept in the joint custody of the contractor and the engineer-in-charge. The empty tins shall be not removed from the site of work, till this item of work has been completed and passed by the Engineer-in-charge.

REPORTATION OF THE SURFACE

For new surface shall be thoroughly cleaned of dust, old white or co lour wash by washing and scrubbing. The surface shall then be allowed to dry for at least 48 hours. It shall then be sand papered to give a smooth and even surface. Any unevenness shall be made good by applying putty, made of Plaster of Paris mixed with water on the entire surface including filling up the undulations and then sand papering the same after it is dry.

Incase of old work, all loose pieces and scales shall be removed by the sand papering. The surface shall be cleaned of all grease dirt etc.

Pitting in plaster shall be made good with plaster of Paris mixed with the color to be used. The surface shall then be rubbed down again with a fine grade sand paper and made smooth. A coat of the plastic emulsion shall be applied over the patches. The patched surface shall be allowed to dry thoroughly before the regular coat of plastic emulsion is applied.

APPLICATION

PRIMMING COAT: - The priming coat shall be with plastic emulsion primer or cement primer, as required in the description of the item. The application of the plastic emulsion primer shall be as described as above.

NOTE: - If the wall surface plaster has not dried completely, cement primer shall be applied before applying plastic emulsion on walls. But if emulsion is done after the wall surfaces are dried completely, emulsion primer shall be applied.

Oil bound distemper is not recommended to be applied, within 06 Months of the completion of wall plaster. However, newly plastered surface if required to the distempered before a period of 06 Months shall be given a coat of alkali resistant priming paint conforming to IS:109 and allowed to dry for at least 48 hours before distempering is commenced.

For old work no primer coat is necessary.

TECHNICAL SPECIFICATIONS FOR ELECTRICAL WORK

TECHNICAL SPECIFICATION (ELECTRICAL)

The Electrical installation work shall confirm to the following I.S. Standards (latest additions), Local Supply Authorities Rules and Regulations and Fire Safety Norms.

1) IS: 732 Code of Practice for Electrical wiring installation (System Voltage not exceeding 650V)

2) IS:1646 Code of Practice for fire safety of buildings (General Electrical Installation).

3) IS:9537, PART-II 1981 Rigid steel conduits for electrical wiring.

4) IS:2667 Fittings for rigid steel conduits for electrical fittings.

5) IS:2509 Rigid non-metallic conduits for electrical installations.

6) IS:1293 Pin Plugs and Sockets.

7) IS: 694 PVC insulated cables with copper conductors for voltages up to 1100 Volts.

8) IS:9532 Specification for conduits for Electrical Installation

9) IS:3854 5A & 15A Switches.

10) IS:3043 (1981) Earthing.

11) Indian Electricity Act, 1956 and Rules and Fire Insurance Regulations.

12) !S : 2026 Specification for power transformer.

13) IS : 2099 Specification for high voltage porcelain bushings.

14) IS : 355 Specification for insulating oil.

15) IS : 3639 Specification for fittings and accessories for power transformer.

A-01. POINT WIRING:

a) METAL CONDUITS:

All conduit pipes shall confirm to IS 9537 PART-II 1981. Metal conduits shall be ERW black enameled 20mm/25mm as the case may be depending upon the number of wires permitted as table-1. The conduits shall be fixed to walls/ceiling with M.S. saddles and spacers at an interval of 1 meter and on either side of bends.

All conduit accessories shall be 16 gauge & bends shall be of inspection type. All bends, couplers, threaded portions etc. Shall be painted with anti-corrosive paint. Bends in the pipes shall be done with bending hickies.

All pipes shall be cleaned for sharp burrs. Switch boxes shall be of G.I. 16G/14G. The switch boxes shall be concealed as per site requirement & as per Architect's/Consultant's Instructions.
Point shall be controlled with 5A switch or directly from DB as specified in schedule of quantities. Where plate type switches are not specified the switch board shall have 3mm thick hylum sheet on which switches shall be mounted. The wiring shall be carried out with multi stranded PVC insulated copper wires of 1.5 sq. mm. 2nos (Phase & Neutral) & 2.5sqmm(Earth) . In all cases the earth shall be of green color and neutral shall be black color. All wires used shall be of 660 V grade. The point wiring shall be inclusive of circuit wiring from Distribution Board to the switch board unless otherwise stated in schedule of quantities. The circuit wiring shall be with 3 nos. of 2.5 sq. mm PVC insulated multi stranded copper conductors color coded as detailed above. The rate shall also be inclusive of any chasing as directed by the Architects/Consultant/Client's Engineer to conceal the drops and finishing the same.

In case of group control directly from Distribution Board, the primary point shall be from D.B. to the first point and secondary point from first point to the next point looped. The point shall terminate into the 3 plate-ceiling rose.

While laying the conduits in the slab before casting the slab, all drops shall be laid accurately to fall in position of the switchboard. Junction boxes shall be sand filled. All joints shall be airtight. Conduits shall be fastened to the re-enforcement properly so that the conduits do not get dislocated while casting the slab. All conduits shall have 18 swg fish wire.

b) PVC CONDUITS:

The PVC Conduits shall confirm to latest IS standards and shall be of medium gauge. The conduits shall be joined with PVC adhesive at Joints. The Conduits shall be fixed to walls/ceilings with GI, Spaces and Saddles at an interval of 60 cms & on either side of bends. The number of wires drawn in the conduits shall be as per table 1. The point wiring shall be controlled as in (a) above. The wiring shall be done with 2nos. of 1.5 sq. mm (Phase & Neutral).& 2.5sqmm (earth) PVC Insulated, copper conductors, multi stranded and color coded with green as earth and black neutral.

The circuit wiring shall be with 3 nos. of 2.5 sq. mm PVC insulated, copper conductors, multi stranded from distribution board to switch board and the rate shall be included in the point wiring unless otherwise stated in the schedule of quantities . All other details shall be as for metal conduits.

C) CASING CAPPING/ TRUNK AND TRUNKLING:

PVC casing shall be fixed, wooden partitions by means of screws spaced not more than 60 cms apart. Holes for fixing the PVC capping shall be done by drilling machine only and these holes shall be plugged

with PVC plugs or grips to which the screws shall be fastened. No less than 1 inch PVC casing shall be used. All bends, tees, joints etc. shall be done in workman like manner with standard accessories. The number of wires in PVC casing capping shall be limited to a fill factor of not more than 60%. The point shall be controlled by 5 amp switch. The switch boards shall either be flush mounted with partitions or surface mounted or concealed mounted as per site requirements and as directed. The wiring shall be carried out as described in (a) and (b) above. This wiring shall not be done for concealed wiring & wiring over the false ceiling work.

A-02. DISTRIBUTION BOARDS:

These shall be of sheet metal and of standard design with copper bus bars. The board shall be fixed at accessible heights. The boards shall be solidly fixed to walls/partitions, concealed or open as directed. All connections inside the distribution board shall be neatly arranged and tied with PVC strings. The MCB's shall be of 9 KA for fault level. The distribution boards shall be suitably earthed. Legend shall be written on D.B. with paint for identification of D.B. & Circuits.

A-03. CABLES*:*
Cables shall confirm to IS 1554-1976. Cables shall be heavy duty, armoured, PVC insulated & PVC sheathed 1.1 KV grade aluminum or copper. Cable shall be fixed with G.I spacers & saddles at an interval of 45 cms and on every side of bends. The bending radii of cables shall be as per manufacturers instructions and in no case it shall be less than 12 times the overall diameter of the cable. Cable shall be so installed that they are not subject to mechanical damage. If there is a bend in the cable enclosed in a conduit, care has to be taken to prevent undue compression of insulation. This applies also to the top of vertical runs of longer than 5 meters where there could be compression caused by the weight of unsupported vertical cables. Cables may rest without fixing in horizontal runs or ducts or trunkings. The cables run in cable trays shall be fixed with cable ties at intervals of not more than 30 cms. No joints in the cables shall be permitted unless the cables exceed the standard drum length. Joints if so necessary shall be located in accessible position. Termination of the cables shall be done with heavy duty copper/Aluminum lugs and brass cable glands.

Cables laid under ground shall be to a minimum depth of 750 mm. It shall be ensured that cables laid underground are free of water lines, sewage lines etc. The trenches shall be at least 30 cm wide & filled with 10 cms thick of layer of dry sand on which the cable shall be laid. Further, 10 cms thick sand layer shall be put on the cable over which a brick layer shall be kept. The trench shall than be back filled with soft earth, rammed and consolidated to original level. Cable route indicators shall be laid at intervals of 20 metres and at all change in directions.

For cables laid on walls aluminum tags shall be fixed showing the size of the cable and the feeder number of the cable. These tags shall be at each ends and at least one or two places at intermediate positions.

The mode of measurement of the cables shall be as follows:

i) For top entry of the cable, the measurement shall be taken up to the bottom of that switch- gear.

ii) For bottom entry of the cable, the measurement shall be taken up to the top of that switch board. No wastage shall be allowed for measurements.

A-04. SWITCH FUSE UNITS:

Switch Fuse Units shall be of sheet metal or iron clad with HRC fuses as described in schedule of quantities. The unit shall be of robust construction of standard specified make, design to withstand adverse working conditions. It shall have quick break type mechanism with ON and OFF position

indicators of the operating handle. The switch shall be interlocked so that the unit cannot be opened in ON condition. The interior shall be so arranged that clearance from live parts is adequate and shrouded. Manufacturer's instructions shall be followed for installation of switch fuse units. The switch shall be solidly earthed. The switch shall be mounted on walls on angle iron support grouted to wall. The supports shall be treated for rust treatment & painted with 2 coats of synthetic enamel paint. The height of the switch board shall be such that it is accessible for operation & maintenance.

A-05. POWER PANELS:

The Power panels shall be fabricated from MS sheet steel 16 gauge and shall be of compartmental design. The main supporting framework shall be of angle iron or of heavier gauge sheet metal. The panel shall be self-supporting design, dust and vermin proof, dead front and fully inter locked with isolating switches. The panel-mounted switches shall have Interlock defeat for testing and inspection.

The panel shall be designed so as to facilitate inspection, cleaning and repairs. The clearance between phase to phase and phase to earth or metal parts shall be as per relevant IS standards. The metering instruments like volt meter, ammeter etc. shall be flush mounted and shall be of 1.0 class accuracy and of standard design size shall be 96 mm x 96. All indication lamps shall be of neon type.

The panel shall have separate cable ally and a bus bar chamber. The bus bars shall be rigid hard drawn tinned electrolytic copper & sleeved with heat shrinkable sleeves. The current density shall not exceed 1.30 amp per sqmm and the neutral bus shall be rated for capacity of phase bus unless otherwise stated in schedule of quantities/drawings. However, the minimum size of bars shall be 25mmx3mm.

The panel shall be powder coated comprising of degreasing and de-scaling in sulphuric acid etc with synthetic enamel paint for smooth finish. The color of paint shall be battle-ship grey or as directed. The Panel shall be tested at site before commissioning. The Panel drawings shall be got first approved from Consultants before taking up for fabrication.

All wiring inside the panel shall be done with switchboard copper conductors/cables solid copper links. The insulators for supporting the Bus-Bars shall be epoxy based cast resin. All hinged doors shall be earthed with flexible braided copper earth. An earth bus of copper shall be fixed along the length of the panel at the lower section. Adequate ventilation for the panel shall be provided. Logic diagram of operation of switches shall be painted on the panel. The name plates for each feeders shall be of engraved design and pasted to the respective switch gear. The letters shall not be less than 10 mm size for individual feeders and not less than 18 mm for the main feeders. All switchgear to be mounted in the panel shall be as per schedule of quantities.

A-06. EARTH PITS/STATION:

The Earthing station shall be done as per IS 3043 (1981) and as per drawing no. E1. The earth pit shall be at least 2.5mtrs deep with GI Plate electrode. The GI plate electrode shall be hot dipped of 600mm x 600mm x 6mm thick. The size for copper electrode shall be 600x600x3mm thk. An alternate layer of salt and charcoal shall be filled up to 200 mm above the top of the electrode. The electrode shall be connected with 50mm x 6 mm thick GI Flat for GI electrode & Copper flat of 40x5mm for copper Electrode, which shall be terminated with nuts and bolts into brick masonry chamber on top. The brick masonry chamber shall be of size 300mm x 300mm x 300mm deep with will carry the funneling arrangement for watering. A GI Flat of 50 mm x 6 mm or as specified in the schedule of quantities, from brick masonry chamber to the switch gear inside the switch room/Equipment shall be laid under ground and/or fixed to walls and the rate for this shall be paid as a separate item as per schedule of quantities.

A-07. INSTALLATION OF ELECTRIC FITTINGS:

All electrical fittings shall be fixed with down rods or on round blocks as stated in schedule of quantities. The down rods shall be 20 mm dia and 1.6mm wall thickness of ERW black enameled MS. The down rods

shall be fixed with ball and socket joints check nuts etc. Special fixtures like spot lights etc. shall be fixed to the false ceilings as per manufacturer's recommendations. The fittings shall be connected with 3 core 0.5 sq. mm. flexible copper cord/cable from ceiling rose and suitable earthed.

A-08 POWER FACTOR CORRECTION PANEL:

The power factor correction panel shall be fabricated from sheet steel & powder coated. The panel shall be compartmentalized with tinned copper bus bars TPN as described for power panels.
The power capacitors shall be heavy duty MD type, low loss, 3 phase, delta connected & self discharged type.
The power factor control shall be done by automatic power factor control relay for controlling the power factor within the set limits by auto switching of required capacitor Banks. The required Capacity /P.F Banks shall be as per schedule of quantities. The P.F. shall be automatically corrected to near Unity.
The C.T. ratio given in the Schedule/diagram is indicative. The same shall be matched for correct operation depending upon the operating load. The relay shall be totally microprocessor based for setting the desired target power factor band. The APFC relay shall have indications like power ON, low current etc & shall be of required stages as per schedule of quantities. The P.F Panel shall have Auto Manual switching facility.

The general specification shall be as follows:
i) System supply voltage 415 volts.
ii) C.T. secondary rating 5 A, 5 VA Burden.
iii) Output switching capacity 5A at 230 V AC & 2A at 440V AC, Operating temperature, 10 degree Centigrade to 50 degree Centigrade. Accuracy better than 1%.
Low current release 10% of full rated C.T.
iv) Switching time between stages 4 to 6 seconds.
v) Range of indications of PF 0.5 lag to 0.5 lead digital.
vi) Display LED indications.
vii) Range of target P.F. setting 0.7 to 0.99.
viii) Switch for auto/manual operation.
ix) Indications for selection of stages.
x) Selection of dead band.

TECHNICAL SPECIFICATIONS FOR HVAC (VARIABLE REFRIGERANT FLOW (VRF./VRV SYSTEM)

- **SECTION – 1.0**

TECHNICAL SPECIFICATION /DATA

NOTE: The tenderer should submit guaranteed power consumption for VRF / V equipment at DB 40 deg C and inside design temp of 22 deg C.

The tenderer should submit their IKW for 25% / 50% / 75% / 100% load conditions for different outdoor units selected. The power consumption for outdoor unit should include Compressor, Condensor Fan & Inverter Drive. You should also submit printed charts of power consumption to substantiate the actual data.

The tenderer should accept a power penalty of 35000/Kw for excess power consumed.

GENERAL CONDITIONS

01.01 **SCOPE**:

This scope under general conditions together with the tender drawings, covers the design, manufacture, assembly and testing, packing for transport to site, transport, loading and unloading, handling of equipment at site, erection, testing and commissioning into service, carrying out all the acceptance tests and handing over the VRV/F HVAC system to consultant.

01.02 **MATERIALS AND WORKMANSHIP**:

All materials used shall conform to the requirements of materials specified in this specification. Where material requirements are not specified they shall conform to the applicable standards and codes approved by the consultant. All materials shall be new free from defects and first class in all respects. Parts shall be free from flaws and objectionable imperfections and shall be machined true in a workman like manner. No deviation from the specified materials are permissible. Wherever materials are not specifically called out, they shall be properly selected by the contractor to the best standards for the particular application and with the prior approval of the consultant.

01.03 **STANDARDS & CODES**:

The design, manufacture and performance of equipment shall comply with all currently applicable statutory regulations and safety codes in the locality where the equipment will be installed. The equipment shall also conform to the requirement of the latest editions of applicable IS/ B.S Standards .The contractor shall refer the relevant sections of this specification for equipment standards and codes. Nothing in this specification shall be construed to relieve the contractor of his responsibility.

01.04 **TENDER DRAWINGS**:

01.04.01 The bidder shall prepare detailed working drawings and get them approved by the consultant before starting the work. After completion of work, the contractor shall have to submit "As built drawings" minimum eight copies each along with the tracing which will be kept as depart.

01.04.02 **INSTRUCTIONS**:

The contractors proposal must include everything required to make a complete working of the system with all statutory approval whether specifically shown and specified or not including all labour and material, transportation etc. necessary for the complete installation of everything described and provided for a complete the system and ready for Owner's use.

It shall be the responsibility of tenderer to check the suitability & site constrains for installing the system at site.

Any apparatus, appliance material and labour which may be necessary to complete the work in accordance with the intent or purpose of these specifications shall be furnished by the contractor without extra cost irrespective of specifically specified in and / or shown on the drawings, or not.

The work shall be done in conformity to the specifications, accompanying drawings and with the requirement of the general, architectural and structural plans & other regulatory & statutory bodies, if required.

01.05 **INSPECTION AND TESTING (GENERAL)**:

The contractor shall perform all tests and inspection necessary to ensure that the material and workmanship conform to the requirements of the contract including fabrication drawings approved by the consultant.

01.05.01 The contractor shall perform all tests and inspection necessary to ensure that the material and workmanship conform to the requirements of the contract including fabrication drawings approved.

01.05.02 The consultant shall have access to the contractor's or sub-contractor's works at all reasonable time to determine compliance with the provisions of this specification and /or to witness the contractor's inspection and tests.

01.05.03 All tests covered by this specification shall be subject to inspection and approval by the consultant

01.05.04 The contractor shall maintain records of all inspection works carried out in his works or in his sub-contractor's works. Copies of such records shall be made available to the department upon request and shall become the property of the Department. A procedure for the repair of defects shall submitted to the consultant for approval, prior to any repair modifications being made. If the previous quality test and inspection are impaired by the subsequent repairs, the work shall be re-inspected and re-tested to the satisfaction of the Purchaser or his authorised representative. Equipment found unsatisfactory as to workmanship or material shall be removed by the contractor and replaced to the satisfaction of consultant at no extra cost.

01.05.05 All materials of components, castings, foreign, piping instruments etc. shall be tested & inspected in the presence of consultant or his authorised representative. Test certificates of all imported components shall be made available for approval of the consultant.

01.05.06 No equipment shall be shipped to site unless it is inspected, tested and certified for acceptance by the consultant or his representative at factory as per latest additions IS, B.S. & other applicable standards.

01.05.07 Final acceptance will be after the equipment is installed and tested at site to give satisfactory performance.

01.05.08 The Contractor shall provide the consultant's Inspectors office facilities, necessary equipment and tooling instruments, drawings and personnel etc. required for inspection of the work.

01.05.09 Strict measures of quality control shall be exercised throughout the work.

01.05.10 Static and dynamic balancing of all rotating parts shall be conducted in the presence of the consultant or his authorised representative.

01.05.11 The contractor shall submit, the following documents before acceptance

1) All the tests observations & calculation, 2) All the operation & maintenance manuals, 3) Leaflet & literature, 4) Test Certificate, 5) Guarantee Certificate & 6) Person to be contacted during Guarantee period.

01.02 **TESTS AT SITE**:

01.02.01 During site fabrication, the pipe branches, elbows etc., shall be inspected and the joints and connections are to be checked before they are assembled in position. After assembly, the system shall be checked for leakage, vibration and noise.

01.02.02 After the complete erection of the system with all accessories are installed at site, these shall be tested as per applicable codes (unless otherwise specified) to check and access their functional performance. The test to be conducted at site in the presence of the consultant's representative, shall include but not limited to the following :

01.02.02a To check capability to deliver rated capacity and power consumption and performance factor after the installations of entire piping, ventilation, ducting etc.

01.02.02b To check capability of piping systems to deliver rated capacities after the installation of the valves & entire piping networks along with required capacities.

01.02.02c To check proper and continuously reliable operation of the system equipments & controls regulating the equipment for a period of minimum seventy two (72) hours, after the complete installation of system.

01.02.02d Leak testing of the pipe work, fittings, connections etc. as applicable.

01.02.02e To check noise and vibrations etc.

01.02.02f Any other tests as required to check compliance with specification and system requirements by statutory bodies

01.02.03 All required instruments consumables & services for the above tests shall be provided by the

contractor.

01.02.04 **SPARES AND TOOLS**:

01.02.04a **Spares**:

The contractor shall offer a complete list of recommended spare parts for the equipment supplied along with the item wise costs for the three years satisfactory maintenance of the System..

01.02.04b **Tools**:

All special tools required for operation and maintenance of the system shall be supplied by the contractor at agreed cost.

01.02.05 **GUARANTEES**:

01.02.05a **Equipment Guarantee**:

The contractor shall guarantee the trouble free & efficient performance of the System for design capacity. One year period (excluding shut down period due to fault) from date of acceptance will be treated as guarantee period. Contractor will have to attend all the faults and replace all material (including consumables) free of cost during guarantee period. Major equipment parts will have to be guaranteed for further one year, from the date of replacement. Any leakage of lubricants due to defective manufacturing or bad workmanship shall also be made good by the contractor free of charge.

01.02.05b The contractor shall further guarantee that the system for optimum operation, the power consumption shall not exceed, under any operating conditions the value specified in the Technical Data Sheets

01.02.05c **QUALITY SURVELLIANCE & PROGRESS REPORTS**:

Quality surveillance relating to all aspects of the contract will be carried out by the consultant or his authorized representative for which the contractor or his approved sub contractor shall:

01.02.05d Allow access at all reasonable time for inspection of manufacture, assembly, testing.

a) The premises in which the work is being carried out.
b) The drawing and /or tooling involved.
c) The gauges, instruments testing equipment etc. required for inspection work.

01.02.05e Produce an inspection plan to the satisfaction of the consultant and notify him when check points on the plan are imminent to enable his representative to be present, if he desires.

01.02.06 Inspection and tests shall be carried out as per the requirements of latest I.S. & details given in specifications of the tender document. Cost of the inspection will be borne by the contractor.

01.02.07 Parts found unsatisfactory, due to substandard workmanship or materials quality shall be removed by the contractor and replaced in a satisfactory manner acceptable to the consultant's

representative. Any modification of inspection procedure or acceptance of the work by the consultant's representative does not relieve the contractor from the responsibility of supply equipment in accordance with the requirements covered by the tender documents.

01.02.07 The contractor shall submit two copies of monthly progress report on the manufacture and assembly, delivery of all equipments covered by this tender documents in the contractor work. In addition, contractor shall submit two copies of monthly progress reports for the site work execution.

Delivery must not take place until the consultant has been notified and written release of the equipment obtained. All materials shall confirm to the standards specification specified in the specification and Technical Requirements. Proof in the form of certified test reports that the required test have been carried out will be acceptable if prior permission is obtained from consultant and he had granted such permission, but if those are not available then the tests shall be performed by the contractor at his own expense in the presence of consultant or his authorized representative.

01.02.08 No inspection & clearance either in verbal or written shall relieve contractor of his responsibility & guarantee.

01.02.09 **OFFER**:

The offer shall be kept open for the period of 60 days after the date of opening of financial bid.

01.02.10 **PROOF OF ABILITY**:

The tenderer shall submit a brief list of the works executed by him to standards and tolerance specified in this tender document.

01.02.11 **DELIVERY AND MANUFACTURE SCHEDULE:**

Delivery and manufacture schedule shall be submitted by the tenderer along with the tender.

01.02.12 **TECHNICAL DATA**:

Technical data of all equipments shall be furnished as required.

01.02.13 **CONTRACTOR'S LIABILITY FOR LOSS, DAMAGES ETC**:

During the execution of contract and until completion certificate issued, the contractor will be fully liable to compensate all concerned for any loss, damage or destruction of "Works" structures, Plant and machinery, persons, property etc., including third party risk arising due to causes attributable to the contractor as may be decided by whose decision in this regards shall be final.

01.02.14 **INFORMATION TO BE INCLUDED WITH THE TENDER**:

The tender shall contain sufficient information to permit a detailed comparison and evaluation of the tenders, including provision of data called for in this tender. All supporting information, technical data, specification required under the various sections of the tender forms and for which there is insufficient space included there in shall be set forth for each part as a separate appendix marked to show clearly specific sections to which it is an appendix. In each case where appendixes are necessary, the forms "See Appendix No. "shall be shown under its specific part and further such

appendixes shall be listed. Any tender not supported by the information requested in this tender document is liable to be rejected. Energy economy oriented equipment / design will only be considered.

01.02.15 **DEVIATIONS FROM ORIGINAL TENDERS** :

The contractor shall submit two (2) copies any suggested deviations from the tender documents in the bid itself for consideration.

01.02.16 **AFTER SALE SERVICE**:

The contractor shall ensure adequate and prompt after sales service in the form of maintenance personnel and spares as and when required with a view to minimizing the break down period. Particular attention shall be given to ensure that all spares are easily available during the normal life of the system.

01.02.17 **NOISE LEVEL**:

The contractor shall ensure that systems provided shall not cause or exceed following noise levels:

01.02.17a 1 m away from outdoor units: 70 dBa

01.02.17b 1 m away from indoor units: 40 dBa

Contractor should clearly state any special treatment if necessary to achieve above noise levels.

01.02.18 **VIBRATION LEVELS**:

The contractor shall ensure that systems shall not cause or exceed the following vibration levels as per ISO, which so ever is lower:-

Pumps & Engines:

i) Horizontal: 80 Micron

ii) Axial: 160 Micron

iii) Vertical: 40 Micron

Permissible allowance: 10%

The contractor shall provide all necessary accessories for limiting vibration level.

01.02.19 **INSURANCES**:

The bidder shall insure at his own cost all the materials during Transit from his factory to the execution site till the systems are handed over to the consultant as per work order specification in Schedule of quantity, drawings. The most stringent shall only be followed.

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SECTION-2.0

LIST OF STANDARDS FOR REFRIGERATION AND AIR CONDITIONING AND VENTILATION SYSTEM

No.	IS Code	Description
2.1		**A) Glossary of terms symbols & terminology**
1.	IS 3615	Glossary of terms used in refrigeration and air-conditioning.
2.	IS 4831	Recommendation on units and symbols for refrigeration
3.	IS 10609	Refrigerants – Number designation
2.2		**B) Safety Standards**
1.	IS : 659	Safety code for air-conditioning (revised)
2.	IS : 660	Safety code for mechanical refrigeration (revised)
2.3		**C) Standards relating to method of testing & code of Practice**
	IS : 5111	Code of practice and measurement procedures for testing refrigeration compressors
	IS : 7613	Method of testing panel type air filters for air-conditioning and ventilation purposes
	IS : 11561	Code of practice for testing of cooling towers.
	ASHARE : 23-59	Standard method of testing for rating water cooled refrigeration condensers.
	ASHARE : 33	Method of testing for rating forced circulation air cooling and air heating coils.
	BS : 4856	Method for testing & rating fan coil units.
	IS : 441	Standard for equipment testing, rating of room fan coil air conditioners.
	BS : 4485 (All parts)	Testing of cooling towers.
	CTI-Bulletin ATP- 105	Cooling tower institute acceptance test procedure for industrial water cooling tower.
10.	IS : 5456	Code of practice for testing of positive displacement type air compressor and exhausters.
2.4		**D) Product Standards**
1.	IS : 655	Metal air ducts (revised)
2.	IS : 1391	Room air conditioners
3.	IS : 1474	Commercial refrigerators
4.	IS : 1475	Self contained drinking water coolers

5.	IS : 1476	Domestic refrigerators (Mechanically operated)
6.	IS: 1669	Ice Cans
7.	IS : 2167	Bottle coolers
8.	IS : 2370	Sectional cold rooms (walk I type)
9.	IS : 2374	Ice tanks
10.	IS : 3315	Evaporative air coolers (Desert coolers)
11.	IS : 7872	Freezers
12.	IS : 8148	Packaged air – conditioners
13.	IS : 9210	Display cabinet
14.	IS : 10617 (Part I to III)	Hermetic compressors
15.	IS : 10594	Thermostat expansion valves
16.	IS : 11329	Finned type heat exchangers for room air – conditioners
17.	IS : 11330	Oil separators
18.	IS : 11338	Thermostats for use in refrigerators, water coolers, beverage coolers etc.
19.	IS : 4503	Shell and tube type heat exchangers
20.	IS : 2372	Specification for timber for cooling towers
21.	IS : 3724	Specification for cartridge type heating elements
22.	ARI : 450 – 61	Standard for water cooled refrigerant condensers
23.	ARI : 495-61	Standard for refrigerant liquid receivers
24.	ASA-B : 31.5	Code for refrigerant piping
25.	BS : 5720	Code of practice for mechanical ventilation and air-conditioning in building
26.	ARI : 410	Standard for forced circulating air-cooling and air heating coils.
2.5		**(E) Pipe work**
1	IS : 3589	Specification for ERW pipes for water & sewage
2	IS : 1234	M.S. tubes & tubular
3	IS : 554	Pipe threads
4	IS : 823	Code of practice of metal arc welding
5	IS : 1536	Flanges
6	IS : 814 (I & II)	Electrodes for metal arc welding
7	IS : 1239 (I & II)	Mild steel tubes, tubulars & other wrought steel pipe fitting
8	IS : 817	Code of practice for training & testing of metal arc welders
9	ASI: B 16.25	Butt welding joints

10	ASTM A 53	Pipe steel black & Galvanized welded & seamless
11	ASTM A 135	Electrical resistant welded steel piping
2.6		**(F) Sheet Metal work**
1		Galvanized steel sheets (120 GSM)
2	IS : 665	Metal air ducts (revised)
3	IS : 702	Hot bitmen
4	IS : 8183	Thermal conductivity
5	IS : 3183	Mineral Wool
6	IS : 1663	Method for tensile testing of steel sheet & Strip of thickness 0.5mm to 3mm.
7	IS : 2629	Recommended practice for hot-dip galvanizing of iron & steel
2.7		**(G) Equipments**
1	IS : 210	Grey Iron casting
2	ASME/ANSI B 16.1	Cast iron piping flanges / flanged fittings
3	ASME/ANSI 16.5	Pipe flanges/flanged fitting
4	IS : 848	Methods of performance tests for fans
5	IS : 2997	Air circulator type fan and regulators electric
6	IS : 3588	Axial flow fans, electric
7	IS : 4894	Centrifugal fans
8	IS : 6272	Industrial cooling fans (man coolers)
9	IS : 3963	Specification for roof extractor units
10	IS 4894	Specification for centrifugal fans
11	IS : 1520	Specification for horizontal centrifugal pumps for clear, cold, fresh water
12	IS : 5120	Technical requirement for roto dynamic special purpose pumps
13	IS : 9137	Code for acceptance tests for centrifugal mixed flow and axial pumps - Class-C
14	IS : 4928	Specification for quick closing clock valve for centrifugal pump outlet
15	BS : 599	Method of testing pumps
2.8		**(H) Electrical system**
1	IS : 325	Three phase induction motors
2	IS : 1231	Dimensions of three phase foot mounted motors.

3	IS : 4691	Degree of protection provided by enclosure for rotating electrical machinery
4	IS 3202	Code of practice for climate proofing of electrical equipment
5	IS : 4728	Terminal marking and direction of rotating for rotating electrical machinery
6	IS : 4029	Guide for testing three phase induction motors.
7	IS : 4729	Measurement & evaluation of vibration of rotating electrical machines
8	IS : 4889	Method of determination of efficiency of rotating machines
9	IS : 2253	Types of construction and mounting of induction motors
10	IS : 2223	Dimension flange mounted induction motors
11	IS : 2254	Dimension of vertical shaft motors for pumps
12	IS : 2968	Dimension of slide rails for electric motors.
13	IS : 4722	Rotating electrical machines
14	IS : 7816	Guide for testing IR of rotating machines
2.9		**(I) Power & control cables**
1	IS : 1554	PVC insulated electric cables (Heavy Duty)
2	IS : 694 (I)	PVC insulated cable with copper conductor
3	IS : 8130	Conductors for insulated electric cables
4	IS : 3975	Mild steel wires for armouring cables
5	IS : 5831	PVC insulted and sheathed electric cables
6	IS : 3961	Recommended current rating of cables
7	IS : 1554	G.I. armouring
8	IS : 732	Code of practice for electrical wiring installation upto 650 V
9	IS : 2274	Code of practice for electrical wiring installation above 650 V
10	IS : 1646	Code of practice for fire safety of bldg. (General) Electrical installations
11	IS : 5908	Method of measurement of electrical installation in building
12	IS : 3043	Code of practice for earthing
13	IS : 5216	Guide for safety procedures and practice in electrical works.
14	IS : 900	Code of practice for installation & maintenance of induction motors
15	IS : 5224	Code of practice for maintenance of A/C induction motor starter upto 1000 V
16	IS : 5561	Electric power connectors
17	IS : 3914	Code of practice for selection of A.C. induction motor starters. Voltage not exceeding 1000 Volts

18	Regulation & Rules	Indian electricity rules factory act and regulation other statutory local, state & municipal regulations, National electric code -1980

Note: For imported equipments, the equivalent International Standards shall be followed.

SECTION-3.0

GENERAL DESCRIPTION:

03.01 Scope:

This specification together with schedule of quantities and tender drawing enclosed, covers, the design, manufacture, assembly & testing at manufacturers works, delivery at site, installation testing & commissioning into service carrying out all acceptance tests for VRF air-conditioning and ventilation systems.

03.01.01 The air-conditioning and ventilation system shall mainly consist of following equipment and accessories. :

As per Schedule of Quantities.

03.02 Basis of Design & system proposed.

03.02.01 LOCATION: **"Ground floor, (erstwhile Ravissant Premises), New India Center, Dr. Babasaheb Ambedkar Chowk, 17-A, Cooperage Road, Colaba, Mumbai, Maharashtra 400001.**"

03.02.02 SCOPE OF WORK: The work proposed includes design, detailed engineering manufacturing, procuring, supplying, providing, fixing, testing, commissioning and handing over of the VRF Air-conditioning system for the proposed building.

03.02.03 DESIGN CONSIDERATIONS

It is proposed to provide Digital scroll / Inverter Type VRF HVAC system using Advance State Art of Technology. The air conditioning system will be designed to provide maximum flexibility reliability & less energy consumption in comparison to conventional HVAC system. It is proposed to use various types of indoor units like Cassette type, wall mount type or ductable type units in Zones/areas to be conditioned within individual remote control devices. The stale air from toilets would be exhausted by means of exhaust fans for nominal ventilation..

SYSTEM DESCRIPTION

The VRF system with R 410a Ref shall have both Indoor & Outdoor units Imported. The outdoor units shall be installed on terrace on each block & shall be connected by means of copper refrigerant piping to ensure optimum design efficiency.

The Ref Piping shall be insulated with 19 mm thick nitrile rubber insulation / cross Linked polyethylene with PVC coating

BASIS OF DESIGN

A Location : Mumbai
B Station Index : 43003
C Latitude (North) : 18. 9 ^{O}C
D Longitude : 72.82 deg. East
E Altitude : 11.00 SL

Outside conditions

	DB	WB	RH%
SUMMER (APRIL)	100 F (38 Deg. C)	83 F(28.3 Deg. C)	60%
MONSOON (JULY)	85 F (29.4 Deg. C)	82 F(278 Deg. C)	88%
WINTER (JAN.)	65 F(18.3Deg.C)	58 F (14.4 Deg. C)	65%

03.03 For optimum design the following has been considered for energy conservation based on Cooling DB/MCWB datas.

03.03A MC DB – 34.3 ^{O}C MCDB - Mean Coincident Dry Bulb
03.03B MC WB – 23.3 ^{O}C MCWB - Mean Coincident wet Bulb

03.03.01 For cooling WB/MCDB
DB : 31.3 ^{O}C, WB : 27.5 ^{O}C
(These ambient conditions are as per guidelines on weather data & design condition of India by ISHARE, ASHARE & TERI.)

03.03.02 Inside conditions:
Comfort Air-conditioning: 22 ^{O}C +/- 1 ^{O}C DB & RH in comfort range.
03.03.02A Lighting load : 15 W/ Sq.m.
03.03.02B Equipment load : 30 W / sq.m.

03.04 Fresh Air : 5 CFM per person with Air OZONE Injection System.

03.05 Occupancy : 6 Sq.mm per person.

03.06 Roof insulation: All the exposed roof shall be insulated with 50mm. thick expanded polystyrene or equivalent insulation.

03.07 Glazing – All windows will have heat reflecting glass in air tight frames & shall be preferable double glazed.

SECTION – 4.0

VARIABLE REGRIGERANT FLOW SYSTEM (V.R.F. SYSTEM)

04.01 **SYSTEM DESCRIPTION:**

The Variable Refrigerant Flow (VRF- R 410a refrigerant) System should be air cooled, spilt type air conditioning systems consisting of singular condensing units connected to multiple indoor units, each having the capability of individual set point control. Each Condensing unit should incorporate at least two digital scroll compressors to obtain 10% to 100% stepless capacity control for enhanced Power saving. The indoor units should be provided with Cordless Remote Control as a standard accessory.

The indoor and outdoor units should be BMS Compatible and it should be possible to monitor not less than 1000 indoor units from a single PC.

The VRF units shall be capable of operating within a wide range of ambient temperatures. The Condensing units should be capable of provide cooling within an ambient range of -5 Deg. C to 45 Deg. C DB and heating in the range -10 Deg. C to 15 Deg. C DB. The regulation in Refrigerant flow is to be achieved by Digital Scroll Compressors head pressure control (by varying fan speeds) & hot gas bypass connection.

Each outdoor unit upto 48 HP should have at least 1 Variable (Digital or Inverter) & 1 fixed compressor & for units above 12 HP should have 1 Variable & 2 fixed compressors.

04.02 **AMBIENT CONDITIONS:**

Minus 05 ^{O}C to plus 45 ^{O}C

04.03 **REFRIGERANT**:

The Entire Condensing unit and Evaporating unit should be factory assembled and tested. The units should come with an initial charge of refrigerant R410a from the factory. Any additional required refrigerant shall be added at site free of cost and loss of refrigerant due to defect in equipment or workmanship shall also be filled up free of cost during execution and guarantee period.

04.04 **REFRIGERANT PIPING DISTANCE LIMITS** :

To be capable of refrigerant piping runs up to 150 m between the condensing unit and indoor units with 50m level difference without any oil traps or double risers. The oil Equalizing line should be inside the Condensing unit, to avoid 'inverted' oil traps at site. The level difference between fan coil units connected to the same refrigerant circuit can be extended to 15m.

04.05 **REFRIGERANT PIPEWORK**:

The scope of Refrigerant Piping work shall include Supply, installation, testing and commissioning of all interconnecting pipe-work between the condensing unit & indoor units. Refrigerant quality seamless copper tubes with brazed connections and the appropriate Distribution joints and headers shall be used. The piping should be routed at site in such a manner, that brazed joints in the Refrigeration Piping are kept to a minimum.

04.06 **JOINT ORIENTATION:**

Proprietary Distribution refrigeration pipe joints and headers shall be installed in an appropriate orientation to enable correct distribution of refrigerant. The Distribution joints shall be factory insulated with pre-formed sections of expanded Polystyrene / equivalent.

04.07 **CLEANLINESS OF PIPING:**

All pipe-work must be kept clean and free from contamination to prevent breakdown of the system. All pipe ends shall be kept sealed until immediately prior to making a joint.

04.08 **PRESSURE TESTING**:

After complete installation of refrigerant, pipe work shall be pre-pressure tested and repaired if necessary and further pressure tested to 3,800 Pa, to hold for a minimum 24 hours with dry nitrogen prior to insulating the joints. After satisfactory testing, the refrigerant pipe shall be evacuated and dehydrated to (- 755 MM HG) and held for one to four hours depending on the pipe length.

04.09 **ADDITIONAL CHARGE**:

Additional refrigerant charge weight must be calculated based on the actual length of the refrigerant pipe work. The refrigerant charging process must be carried out with an appropriate charging station & under supervision of Consultancy.

04.10 **PIPING INSULATION**:

All suction lines in the Refrigerant pipe work shall be insulated with as specified to avoid condensation.

04.11 **FIXING PIPE WORK**:

Pipe works shall be fixed supported at a minimum of 2 metre centers suitable saddling arrangement. The exposed Refrigerant pipes on the terrace shall be covered with openable GI Cable trays.

04.12 **INDOOR UNITS**:

The indoor units shall be Hi-Wall / Cassette type as shown in drawings and site constraint. All indoor units shall be provided with Cordless Remote controls for ease of operation.

ELECTRONIC EXPANSION VALVE

Each indoor unit shall be fitted with an electronic expansion valve to control the refrigerant flow in response to the load variations in the room. The electronic expansion valve is to be controlled via a computerized control sensing the return air temperature, refrigerant inlet and outlet temperatures. During the cooling operation the electronic expansion valve shall control the refrigerant superheat degree at the evaporator.

INDOOR UNIT FANS

Shall be direct driven of the DIDW multi-blade type, statically and dynamically balanced to ensure low noise and vibration free operation. The noise level shall not exceed 40 dBa.

COOLING COILS

Shall be direct expansion, constructed from copper tubes expanded into Aluminium fins to form a rigid mechanical bond.

04.13 **SUPPLY AIR DISCHARGE LOUVERS**

The indoor units shall be provided with auto swing type supply air louvers for cassette and under ceiling type indoor units. The louvers shall be capable of providing continuous swing operation or to be fixed in any direction required.

04.14 **UNIT CONTROL BOARD**:
It shall Include in the indoor unit a printed circuit board complete with, address switches for a variety of operation controls, emergency operation switch and fault / operation indication LED's. The fan motors shall be thermally protected.

04.15 **UNIT CASING:**
The indoor unit casing (ceiling mounted units) shall be fully insulated and sealed to prevent condensation.

04.16 **CONDENSATE DRAIN**:
The Drain connection of each indoor unit to the main Header should be of Min.25mm dia. The header pipe should be of 40mm dia. The drain pipe should be of hard PVC, whereas the connection of the indoor unit to the hard PVC pipe / GI pipings shall be with flexible braided pipe. The drain piping should be insulated with 9mm., thick tubular Nitrile Rubber Elastomeric insulation and the cassette type units shall be provided with condensate drain water pump it should lift the water to the drain headers automatically.

04.17 **UNIT CONTROL**:
In case of individual and group control, set the addresses of each indoor unit to minimize commissioning time. In case of centralized control, set the addresses by the remote controller.

04.18 **CONDENSING UNITS**:
To be fully weatherproofed, factory assembled and pre-wired with all necessary electronic and refrigerant controls. Construct the casing from mild steel panels coated with a baked enamel finish and powder coatings. The condenser coil fins shall be provided with a corrosion resistant finish.

04.19 **LARGER CONDENSING UNITS**:
Each outdoor unit upto 12 HP should have at least 1 Variable (Digital or Inverter) & 1 fixed compressor & for units above 12 HP should have 1 Variable & 2 fixed compressors.

04.20 **MODULAR DESIGN**:
Make provision for side by side installation by the modular design of the condensing units.

04.21 **FAN MOTOR SPEED CONTROL**:
The condensing unit fan motors to have at least two speed operation to maintain constant head pressure control in all ambient temperatures and modes of operation.

04.22 **COMPRESSORS**:
Provide highly efficient hermetic scroll type compressors. Provide the Digital Scroll compressor with electronic controls, capable of loading and unloading to follow the variations on cooling and / or heating loads, using the latest axial compliant sealing technology. The microprocessor panel should incorporate control for precise monitoring of status of the system. The use of inverter type compressors shall be avoided as far as possible to prevent electromagnetic interference & conversion losses.

04.23 **HEAT EXCHANGERS**:
The heat exchanger shall be constructed from seamless copper tubes rigid mechanically bonded to Aluminium fins to form a cross fin coil. Treat the Aluminium fins with an anti-corrosion film.

04.24 **REFRIGERANT CIRCUIT**:
The refrigeration circuit for the condensing units shall be completed with refrigeration compressors, motors, fans, condenser coils, electronic expansion valve, solenoid valves, 4 way valve, distribution headers, capillaries, filters, shut down valves, service ports, receivers and accumulators and all other

components which are essential for safe and satisfactory operation.

04.25 **SAFETY DEVICES**:
Following safety devices shall be provided as a part of the outdoor unit. High pressure switch, fuses, crank case heater, fusible plug, over current protector.

04.26 **OIL RECOVERY**:
The unit shall be equipped with an oil recovery system to ensure stable operation for systems with long refrigerant piping. The oil recovery system shall be operated after the first hour of operation and then every consecutive 4 hours of operation. High efficiency oil separators shall be fitted to the discharge side of the compressor together with factory fitted oil equalization system.

04.27 **SELECTION SWITCHES**:
Shall fit the condensing unit printed circuit board (PCB) with selection switches for the length of pipe work, emergency operation switches and service mode switches, together with LED indications for operation / fault indications.

04.28 **CONTROL**:
Shall use computerized control to maintain a correct form of temperature. For the indoor units incorporate an on /off switch, fan speed selector, thermostat setting and liquid crystal display which indicates temperature setting. Operational mode, malfunction codes etc.

04.29 **INDOOR UNIT CONTROL**:
Shall be accomplished by the use of individual controllers for each indoor unit.

04.30 **FAULT DIAGNOSIS**:
The system shall be equipped with a diagnostic function for quick and easy maintenance and service.

INDOOR AIR QUALITY SYSTEM SPECIFICATIONS

The air ozone system shall be a product of a manufacturer normally supplying this type of equipment and who can show evidence having completed at least 3 installations of magnitude of size not less than 1000 TR of air conditioning in India, operating successfully in hot, humid and dusty environment for two years or more typically for high occupancy applications such as offices, office complexes, malls etc.

The local system provider should have a track record of having successfully engineered, installed and commissioned at least 50 numbers of air ozone systems in India with controls as specified and which are working successfully for more than a year. A listing of such projects shall be furnished along with contact details for reference and site verification.

The local system provider shall have qualified personnel competent in this trade and shall have adequate service set-up to render comprehensive maintenance service including scheduled calibration of sensors. He shall also maintain adequate stock of spares to meet any eventuality including replacement if necessary. He shall commit to a response and completion time of less than 48 Hrs in the event of a breakdown.

The manufacturer and the system provider shall offer necessary technical assistance in the event of a contingent litigation arising out of any issue related with the air ozone system provided by him.

The parameter of residual ozone concentration is the most critical in this application. In the event of this level consistently exceeding the permissible norms as spelt out in the basis of design (as recorded in the trend analysis by the sensor), for a period of one week, the system provider shall, at his expense, bring it back to acceptable levels within one week.

It is very important the manufacturer/systems provider must provide copies of system performance tests conducted at least 5 sites, by a nationally recognized and independent environment testing laboratory. These test results must show documented results of VOC, CO2, and residual ozone, before and after startup of ozone system.

Additionally, the test results should document individual VOC trace at each site and their extent of reduction after ozonization. Approved laboratories are OSHA, NEERI, or equivalent.

TECHNICAL SPECIFICATIONS

AIR OZONE SYSTEM

01.00 **SCOPE**

The scope of this section consists of but is not necessarily limited to the following:

Manufacture and supply of duct mounted air ozone generators with associated sensors, controllers and accessories.

All associated items herein to be supplied, delivered, installed, commissioned, tested and handed over.

Provide specialist's agencies representative's services including coordination and supervision in start up and testing.

Testing, start-up and supervision training and providing necessary documentation for operation. Carry out performance test at site.

02.00 **QUALITY ASSURANCE PROGRAMME**

The Ozone system shall be sized in accordance with the parameters indicated in the Basis of Design. The system shall be engineered to achieve results as recommended by ASHRAE STANDARDS 62-1999 table 3, page 13.

03.00 **CAPACITY**

The capacity of the ozone system shall be selected by the specialist manufacturer based on the data given in the Basis of Design.

04.00 **OZONE GENERATORS**

04.01 Ozone Generators shall be provided with the primary aim of achieving reduction in Volatile Organic Compounds (VOC), hydrocarbon gases, and organic odors, in Indoor Environment. They shall also serve purpose of depleting and inhibiting growth and propagation of microbial organisms and micro flora, commonly found in indoor environments, HVAC ducts, cooling coils and on air filters. VOC reduction shall be achieved by oxidation of VOC by ozone. Depletion of microbial colonies shall be achieved by inhibiting their growth and propagation.

04.02 The aim is to ensure the VOC are kept below the TLV (Threshold Limit Value) for occupied areas, as recommended by OSHA and or ACGIH.

04.03 Notwithstanding ASHRAE recommendations of residual ozone concentration not exceeding 50 PPB (v/v Parts Per Billion), the system should be engineered in a manner that this level does not exceed 30 PPB.

04.04 Ozone Generator shall be self contained unit, with all components factory assembled in one neat, compact package, suitable for duct mounting

04.05 Components in contact with air shall be enclosed in stainless steel casing 18 G thick with sufficient stamped integral openings to allow adequate flow of air over the corona discharge plates

04.06 Method of ozone production shall be by principle of corona discharge, with multiple numbers of double sided corona plates. Production density of ozone per unit surface area of corona surface shall be very low. Ozone shall be produced from the supply air of AHU/fan. Air pressure over the corona

surface shall not exceed air pressure in the duct. Electrical frequency applied on corona plates shall be the same as line frequency (60 Hz or 50 Hz). All corona plates shall be housed in a common stainless steel enclosure.

04.07 Detection/Sensing of VOC and production of ozone shall be in the same gaseous medium

04.08 Corona plates shall be mounted on generator head, specially manufactured to close tolerance, of material that repels accumulation of sediments from tar, nicotine and grease

04.09 The Transformer used in the Generators shall be electrical induction type. Solid state voltage converter shall not be acceptable. The Transformer shall be Cross Ferro Magnetic Type. The transformer windings shall not burn or elevate greater than 60°C, even if the high voltage secondary output is short circuited for extended period of time, in full load conditions. Upon removal of the short circuit, the transformer shall revert to normal operation without any damage

04.10 The transformer shall have dual encapsulation. The first encapsulation is to ensure the transformer windings and core are fully impregnated with epoxy rated for use in electrical equipment. The epoxy shall penetrate into various layers of primary and secondary windings, and into the various sections of the core. This is to ensure electrical spark, if any, shall be contained and isolated within the specific spot of occurrence in the windings, and temperature elevation if any shall be contained and isolated within the specific spot of occurrence of the winding or in the layers of the core. The electrical properties of the epoxy for this encapsulation shall be :

04.10A Dielectric strength at 23°C not less than 425 volt/mil

04.10B Voltage resistivity at 23°C not less than 2×10^{15} Ohm Cm

The second encapsulation is to ensure the transformer is rated to UL Flammability rating UL 94 V-0. This shall also allow maximum continuous transformer rating to 130°C.

The encapsulation shall also render the transformer totally safe to operate even if there is settlement of moisture or water on the transformer due to carry over moisture from Cooling Coil.
There are essential safety prerequisites as the Transformer/Generator is installed in the Air Conditioning Duct, and the facility houses occupants.

04.11 High voltage electrical wire from the transformer secondary terminal to the corona contact plates shall be rated for operation to 20KV, 150°C, certified to be ozone and corona resistant, have high flexibility, and shall be silicon insulated. Wire diameter shall not be less than 18 AWG. The wire shall be rated to UL3239. These shall be stamped on the wire. This is essential and cannot be waived from safety standpoint, as this wire carries high voltage.

04.12 At client's request, the manufacturer or their representative shall present a cut section of the transformer windings and core, to demonstrate penetration of the first encapsulation epoxy into various layers of the primary and secondary windings, and into the core.

04.13 Following tests are mandatory to check the system performance:

04.13a Transformer secondary output, under full voltage and load will be subjected to short circuit continuously for minimum of 24 hours. The primary and secondary windings shall not burn nor elevate in temperature greater than 60°C.

04.13b Upon release of the short circuit, the transformer shall revert to normal operation without any change or modification or repair.

04.13c Demonstrate safe and undamaged operation of the transformer at full secondary voltage and load,

even if the inspector liberally sprays water on the transformer.

04.13d At inspectors instructions, cut open a transformer through the windings and core to demonstrate the penetration of the first encapsulation epoxy into various layers of primary and secondary windings, and into the core.

04.13e Demonstrate that high voltage wire is stamped with ratings of voltage to 20KV, temperature to 150^{o}C, and UL rating 3239.

04.14 The generator shall be suitable for mounting in duct with airflow in horizontal or vertical or angular direction, and for air flow in either direction, right to left, or top to bottom, or vice versa

04.15 The generator shall have the feature for interlock to motor of the AHU, to prevent start of the generator unless the fan is energized

04.14 The generator shall be provided with stainless steel flange in either side to enable mounting to metal frame, to be installed inside the duct

04.15 Ozone Generator shall be manufactured to permit easy withdrawals and refitting in duct with minimum use of tools or hardware to refit the generator to duct

04.16 Generator output shall be suitable for modulation by automatic or manual controls

04.16.01 The generator shall be rated for operation on 0 to 100 % RH.

04.16.02 The generator shall be suitable for operation on electrical supply 220 to 240 Volts, Single Phase, 50 Hz 3 wire system.

04.18 Total Air Quality Monitor

04.18.01 Monitoring, Regulation and Reporting of Air Quality shall be performed automatically on continuous basis, by Total Air Quality Monitor.

04.18.02 The Monitor shall comprise two individual sections; Sensor Section and Display Section. Sensor and Display Sections shall be fully factory assembled complete with factory installed wiring between these, and mounted in one integral housing. All electrical and control cable termination shall be provided in a Terminal Block housed in a rated Junction Box, mounted on the Monitor. All field wiring shall be carried out through this, without the need to open the Monitor. The Junction Box shall also serve as an easy field wall mount device. Field wires shall terminate in one common connector head and shall clip into the terminal in the wall mount junction box of the Monitor.

04.18.03 The Total IAQ Monitor shall have individual Sensors to measure and track TVOC, CO2, Residual Environment Ozone, Temperature and RH. Sensors for all above parameters shall be factory installed in one neat compact Total IAQ Monitor. Individual Stand-Alone Monitors for each parameter is not acceptable.

04.18.04 The Sensors for TVOC and Ozone shall be of HMOS Type. EC Sensing Elements are not acceptable.

04.18.05 The Display on the Monitor shall be Monochrome 4 Line by 20 Character LCD. Programming shall be done by Membrane Switch Keypad. The Display Section shall scroll through all the parameters in quantifiable units. It shall also be possible by the user to stop the scroll and hold steady any parameter as chosen.

04.18.06 It shall be possible for the user to choose the units of the parameters.

04.18.07 The Monitor shall be fully programmable by EPROM Microprocessor Device. It shall be possible for the user to select and set for each parameter, the range of display, set points for activation of dry contact on rising or dropping values, and set alarm levels, in field.

04.18.08 The Monitor shall have at least 5 Dry Contacts. Each Dry Contact shall be user assignable to activate on any of the parameters, for dropping or rising values.

04.18.09 The Monitors shall have Real Time Clock. It shall be possible to view Time History and Real Time History Records of all parameters through Bluetooth Transmitter using Bluetooth compatible computer.

04.18.10 The Monitor shall have 5 user selectable 0-10 VDC Analog Proportional Output. This may be interfaced to client provided BMS/BAS.

04.18.11 Terminal Communicator Devices shall be Bluetooth Receiver Transmitter, LAN for Networking to client's facilities, and Serial Port RS232.

04.18.12 At user's option, it may also be possible to view all operating parameters, graphs, charts, and all programming features including Dry Contact settings through Bluetooth Device with user provided Bluetooth equipped Laptop/PC. The manufacturer shall provide Proprietary Software and Open License to the user for use on the users authorized Laptop/PC.

04.18.13 As Bluetooth communicates by RF, the manufacturer shall either provide FCC Compliance Certification, or a Certificate from the Manufacturer that the Bluetooth Device operates on a band that does not require FCC Certification or licensing.

04.18.14 The IAQ Monitor shall be provided with suitable port and EPROM Device to facilitate site upgrade of the software the manufacturer may provide periodically.

04.18.15 No electrical voltage higher than 24V shall be present in the Monitor.

04.18.16 All parts and components of the Monitor shall be lead free and shall comply to ROHS (Restriction in use of Hazardous Substances).

04.18.17 Power Supply for the Monitor shall be 12V, 1.5 Amp. External power adaptor for conversion of 220V to 12V shall be factory provided with plug in connector. The Monitor shall have factory installed Lithium Battery to prevent loss of data in the event of power failure.

04.18.18 The entire circuit sensor board shall be 24 carat Gold Plated to 3 micron thickness. This is an essential requisite to ensure the PCB and the components do not loose their electrical integrity, accuracy, and life span, due to continuous exposure of sensed air over it, over prolonged period of time. To ensure accuracy and longevity of operation, this clause cannot be waived.

04.18.19 The entire Sensor Board, Display Board, and all sensing elements shall be in one compact factory provided 18G CRS Powder Coated and Satin Finished Enclosure.

04.18.20 The Monitor shall be rated for continuous operation in covered ambient to 60^{o}C and 100% RH.

04.19 **VARIABLE LOAD CONTROLLER**

04.19a Controller shall be solid state, mounted in ABS plastic enclosure.

04.19b It shall be fully factory assembled. Field provided connections should be limited to power wiring.

04.19c The Controller shall be suitable for accepting signals from the Sensor. Based on the signals received, it shall provide variable output to operate IAQ devices.

04.19d Input voltage to controller shall be 220 to 240 Volts, 1 Ph, 50 Hz (Factory set). It shall be suitable for load rating of 10 Amps.

04.19e Controller shall be provided with terminal block to connect incoming power, variable outgoing power, and for interlock to AHU motor or other air moving device.

04.19f The Controller shall be provided with receptacle to accept easy plug in cable connector, for communication to Sensor.

04.19g Controller shall be provided with rocker switch to choose Automatic or Manual Mode of operation. In the Manual Bypass Mode, voltage output of the Controller shall be 100% of input voltage, regardless of the level of VOC.

04.19h Cable connector between Controller and Sensor of required lengths shall be factory provided. This shall be complete with cables to provide power to Sensor and transfer signals for the different levels of VOC from Sensor to Controller.

SECTION- 5.0

CONTROLS AND INSTRUMENTATION

05.01 **Scope**

The scope of this section comprises the supply, installation, calibration and testing of the different controls and instruments complete with control panels.

05.02 **Controls**

The controls required systems shall be electronic solid state type shall be BMS compatible as per the technical specification. The selector of a particular control component shall take into account the function and design requirement. The range and response of controls must be properly selected for a particular stringent application.

05.03 **Controls Panels**

The controls shall be housed in a custom fabricated sheet metal enclosure. The size of the enclosure (Control panel) shall be designed taking into account the type and nos. of control, relays, fuses, starters, etc. to be housed with sufficient, spacing in between and functional sequencing of the controls. The control wiring and cabling running in the enclosure (Panel) shall be neatly arranged in a workman like manner.

Power & control wiring & cabling from the department distribution boards /power supply point upto respective control panels and interconnecting same with controls / instruments and equipment. Every cable and wire leads must be given proper reference numbering to facilitate the checking of routes / termination at different components. All control panels shall have proper keys and locks or wherever asked for the door shall have switch inter lock. All push button / toggle switches, indication lamps etc. shall be surface mounted. The enclosure shall be made of 14 SWG, CRCA sheet metal and with totally enclosed neoprene gasketed metal clad / Dust and vermin proof confirming to IS 2147.

Cable trays, cable lugs, clamps, cable gland etc. Shall be suitably provided, Earthing conductors for individual equipment shall be provided.

Any other electrical item required for the job, not brought out specifically above & as required by local codes and authorities shall provided by the bidder at no extra cost to the department.

Voltage 415 V AC $\pm$ 10%, 3Phase, 4 Wire

Frequency 50 HZ $\pm$ 3 %

Control voltage 240 V AC$\pm$ 10%

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SECTION – 6.0

SHEET METAL WORK

1. **SCOPE:**
   Scope of this article covers supply & installation of sheet metal work, in accordance with the following specifications:

2. **MATERIALS:**
   Ducts shall be made of galvanized steel sheets of 120 GSM. GI sheets shall conform to IS 277-1965 of following thickness:

Maximum Side (mm)	Thickness (mm)
Under 750	0.63
751 - 1500	0.80
1501-2250	1.00
2501 & above	1.25

3. **DAMPERS:**

Provide 18G louver type dampers of robust construction. Design, method of operation etc. shall be suitable for the location & service required.

Provide suitable links, levers & quadrants required for proper operation & control of settings in any position. Dampers & other operating devices shall be made easily operable & accessible through access doors in ducts. Every damper shall have an indicating device clearly showing the damper position. Provide dampers in main ducts & for all branch connections.

4. **GRILLS:**
   All Aluminium side wall supply, return & exhaust air grills shall be similar & equal to **EP-15** with opposed blade dampers.

   Frames for fixing of grilles shall be supplied by the Owner.

   Samples of grilles shall be subject to approval of the architect.

5. **INSTALLATION:**
   Neatly erect all sheet metal work as shown on drawings or as required to carry out the intent of the specifications & drawings, subject to approval of Engineer in all its parts & details. Design ducting system within tender drawing parameter limits like velocities, static pressure etc.

   Make all necessary allowances & provisions for beams, pipes or any other obstructions in the building, whether or not the same are shown on the drawings. Where necessary to avoid beams or other structural work or building services, divert, transform or split ducts without changing the coefficient of friction & subject to approval & discretion of the Engineer.

   Erect ducting in dead spaces in time to avoid delays to other contractors. Support ducts from slab or beams. Support of ducts from false ceiling hangers or resting on hung ceiling is not permitted.

   Install rigidly fabricated ducts with adequate supports & bracing where required. Provide standing seams, tees or angles to maintain true shape of ducts & to avoid buckling, vibration or breathing.

Provide airtight joints with smooth interior surface. Bends to have radius of minimum half the width of the duct unless they are with interior curved vanes. Space vanes to limit aspect ratio of each elbow formed to five.

Fabricate 18 G GI connections, partitions & plenums stiffened with 25mm X 25mm angle iron where required, to confine flow of air to & through filters & fans. Provide necessary doors as required by Engineer to provide access to all parts of apparatus & fire dampers.

Where metal ducts or sleeves terminate in woodwork, brick or masonry provides airtight joints with closely fitting heavy flanged collars.

In case of extreme space limitations use of slip joints may be permitted by the Engineer at his discretion. However the joints have to be made airtight using mastic sealant if required. Also extreme care should be taken while installing these ducts so as to avoid tensions on the joint & also opening of the same.

Proper gaskets shall have to be provided on all joints so as to ensure air tightness.

Only GI nuts, bolts & washers are to be used at all mating connections.
Supports shall be taken from the sidewalls using anchor fastener of adequate size (so as to ensure proper embedment in the concrete & not the plaster). The holes shall be drilled with electric drills. Under no circumstances shall the concrete be chipped.

Connection of indoor units to duct work shall be through a smooth & rigidly held 150mm long double canvass sleeve, securely bonded & bolted to duct & units. Provide 75mm long ZIP fastener in canvass for inserting thermometers.

6. INSULATION:

1. SCOPE:

Scope of this article covers supply & application of insulation as specified.

ACOUSTIC INSULATION OF DUCTS/PLENUMS:

Unless plenums are acoustically insulated, provide acoustic lining with 12.5mm thick Fibreglass having density 48 Kg/cu.m with R.P Tissue Paper and stuck with CPRX cold compound. The insulation shall be carried out upto a distance of 5M from outlet of indoor units.

Insulation backed by 32 G perforated aluminium sheet with 3/32" dia. Holes at 3/16" staggered centers shall be mechanically attached to internal of ducts with 50mm long GI bolts, washers & nuts. Space bolts at maximum 300mm centres and at least 75mm from all corners.

2. Aluminium sheets along periphery shall be minimum 75 mm in excess of the insulation and turned in to avoid the fibres entering the air stream.

Method of applying insulation –

- Apply a thin layer of cold compound.
- Fix up fibreglass slabs.
- Cover up with perforated aluminium sheets as explained above.

3. THERMAL INSULATION

The supply air duct shall be insulated with 25mm thick Fibreglass Twiga – 200 (density – 32 kg/cu. M) and stuck with Bitumen as adhesive. The insulation shall be carried out for the entire supply air duct from outlet of the plenum.

Method of applying insulation –

- Clean the duct surface to be insulated
- Apply a thin coat of good quality bitumen on duct surface to stick the insulation.
- Fix the insulation of specified thickness over the surface of the duct tightly and seal all the joints using 75 mm wide self adhesive Aluminium tape.

4. **INSULATION OF SUCTION LINE :**

Suction piping shall be insulated with 19mm thick elastomeric nitrile rubber class 'O' pipe sections or Cross linked polyethylene with PVC coating

ELECTRICAL SYSTEM

5.1. **SCOPE**

This part defines the scope of design, manufacture, supply, delivery, installation, testing, commissioning, start-up and guarantee of all electrical equipment.

5.1.1 All equipments, control and instruments etc., to be supplied against this contract shall be of proven design by way of actual field operation without any deficiency or problem whatsoever.

5.1.2 The purchase reserves the right to reject any equipment/material or installation not conforming with this specification as well as to increase or decrease the scope of work.

5.1.3 The complete electrical work shall have the approval of Electrical Inspectorate of respective state, Regulation Authority and other local agencies, besides purchaser's engineers. Approvals shall be obtained in writing by vendor from these respective authorities prior to commissioning including approval of such authorities if required.

6.1 **Equipments to be supplied by Client**.

6.1.1 Main supply cubical distribution panel similar to E.E or LT/Zenith Engineers, makes, along with necessary starters, S.P.P. and other safety, and protection devices for safety and performance controls including interlocking of the system proposed.

6.1.2 Main supply cubical distribution panel similar to EF or LT /Zenith make comprising of suitable SFU, indication lamps for systems.

6.1.3 Power and control cable trays for routing the cables from main distribution board to various leads.

6.1.4 Local power and control cubical panel including switch fuse unit, starters, SPP, contractors and earthing for the system with provision for supply to various controls for the entire system.

6.1.5 T.E.F.C. squirrel cage induction motor in conjunction with respective driven equipment of specified make.

6.1.6 Supply, installation and termination of power and control cables between panels and various equipments with earthing.

6.1.7 Supply, installation and termination of earthing conductor for individual equipment for grounding.

6.1.8 Cable, lugs, clamps, clamps glands, etc.

6.1.9 **Equipment Specification**:

The specification for the above equipments and materials to be supplied by vendor shall meet the requirements as mentioned in subsequent clauses.

6.1.9.1 Squirrel cage induction motor :

6.1.9.2 **General**:

The induction motors shall be designed, constructed and tested in accordance with these specification and be suitable for continuous operation of the ambient condition mentioned.

6.1.9.3 **Standards**:

The motors shall confirm with the following Indian Standards unless otherwise explicitly specified herein

IS:	325	Three phase indication motors
IS:	1231	Dimensions of three phase foot mounted
IS:	4691	Degree of protection provided by enclosure for rotating electrical machinery
IS	3202	Code of practice for elimate proofing of electrical equipment
IS:	4728	Terminal marking and direction of rotation for rotating electrical machinery
IS:	4029	Guide for testing three phase induction motors
IS:	4729	Measurement and evaluation of vibration of rotating electrical machines
IS:	4889	Methods of determination of efficiency of rotating electrical machines
IS:	2253	Types of construction and mounted induction motors
IS:	2223	Dimensions of flange mounted induction motors
IS:	2254	Dimensions of vertical shaft motors for pumps
IS:	2968	Dimensions of slide rails for electric motors
IS:	4722	Rotating electric machines
IS:	7816	Guide for testing IR of rotating machines

6.1.9.4 **Technical Parameters:**

System voltage		415 ± 10% , 3 phase, 3 wire effectively earthed (with 3% unbalance in voltages)
Frequency		50 Hz ± 5%
Enclosure		TEFC as per IS :325
Starting		Direct-on-line below 7.5 HP accelerating at 80% voltage at the terminals
Locked rotor current		600% of full less current for DOL motors. 200% for star-delta motors
Pull out torque		200% at rated voltage (for short duration of 25-30 cycles if voltage drops to 75% of nominal motors shall pull out of step).
Degree of protection		IP 55 for all the pumps motors
Winding insulation		Class F maximum winding temperature 150 deg. C. on full load at any point of winding including single phase FHP motors
Space heaters		240 V 01 phase 50 HZ thermostatically controlled to keep the winding temperature 5 deg. C above ambient for motors above 10 KW.
Bearing		Anti-fiction ball or roller type for 1000 RPM upto 50 BHP motors sleeve bearings with two oil rings, lubricated for higher BHP motors. Vertical motors shall be provided with thrust and guide bearing
Mounting		Foot mounted, horizontal (unless otherwise specified).
Starting duty		Capable of at least 2 successive starts and third start after an interval of 15 minutes
Terminal boxed		Large enough for alum. Conductors with six terminals to be brought and shorted with heavy gauge tinned copper plate for DOL or star delta.
Star delta motors & 1 No. brass cable gland for DOL motors		Starter, starting 2 Nos. brass cable gland for ₤₤ Terminal box shall be suitable for top and bottom entry of cables.
Rotation		Be capable of rotating on forward and reverse direction

6.8 **Construction** :

The motor shall be so constructed that efficient cooling is achieved to keep the temperature rise within permissible limits as well as withstand the effect of abnormal operating conditions for a short period on infrequent basis without any damage or deterioration on the life and performance.

The design and manufacture shall be co-ordinated and approximately matched with the requirements of the driven equipment both mechanically and electrically. The motor frame shall be either fabricated or casting of approved quality.

The end windings of the tarter and rotor shall be properly braced and supported to cater for the various operation / starting conditions as well as the effect of the bus transfer.

The motors shall be high efficiency (No less than 95%) squirrel cage type and the design shall provided a rigid cage construction with base firmly webbed in slotter and solidly bonded to the end rings. The motors shall be capable of withstanding without mechanical damage at least 125% rated speed, which may be imposed by the driven equipment in both direction of rotation.

The main base frame shall have two ground terminals for earthing the motor with ground network by appropriate size conductor as specified in earthing clause.

The terminals shall be fitted with tinned copper serrated short barrel lugs. For belt driven motors or directly coupled machines protective covers/ guards shall be supplied for the whole assembled unit. Adjustable slide bases or rails shall be provided for all motors where belt or chain drives are used.

6.8.1 Inspection & Tests:

All motors shall be inspected at various stages of construction by purchaser and tests will be witnessed prior to acceptance. Manufacturer shall notify purchaser the schedule of manufacture to arrange stage wise inspection.

Routine tests shall be conducted on all motor and type tests as per IS : 325 & IS : 4029 will be carried out on one motor of each type.

Six copies of test certificate shall be submitted to purchaser for records.

6.8.2 Drawings:

General arrangement drawings, mountings details, foundations, terminal box drawings shall be furnished to purchaser for approval prior to manufacture. Approval drawings sets) shall be furnished for purchaser's records.

6.8.3 Instruction manuals:

Supplier shall submit 5 copies of instruction manual covering installation, operation and maintenance of motors which shall include procedure for checking alignment of motor shafts, coupling and base. Instruction shall also include lubricating details, inspection and replacement schedules, quantity of lubricant required and its specifications.

6.9 Starters

6.9.1 Motors below 7.5 HP shall have direct on line staring arrangement with in rush starting current of seven times full load current.

6.9.2 7.5 HP and above motors shall be started on reduced voltage by means of automatic star delta starter. C.T operated ammeters shall be provided on all phases on these meters.

6.9.3 The design, manufacture and testing of the starter components and whole assembly shall confirm with the following Indian Standards except for the specified deviation outlined in this specification.

IS :	1822		A.C. Motor starters of voltage not exceeding 1000
IS :	2147		Degree of Protection provided by enclosures for Low Voltage Switchgear and control gear
IS :	2705		Current transformers
IS :	2208		HRC Cartridge Fuse Link upto 650
IS :	4794		Push Button Switches
IS :	1336		Recommendations for colours of Push buttons
IS :	8623		Factory-built Assemblies of switchgear
IS :	6005		Code of Practice for phosphating Iron & Steel
IS :	2959		Contractors for voltages not exceeding 1000 V
IS :	722		AC Electricity meter
IS :	604		PVC insulated copper cables

6.9.3.1 Voltage & Frequency

Voltage	415 V AC $\pm$ 10% 3 Phase 4 wire
Frequency	50 HZ $\pm$ 3%
Control voltage	240 V AC $\pm$ 10% (tapped between phase & neutral)

6.9.3.2 Protective Features

Each starter shall be provided with following protective devices:

Manual reset type bimetallic thermal overload relay on all the phases.

HRC fuse protection on power and control circuitry

Single phase preventor for motor above 7.5 HP shall be provided

Under Voltage protection

6.9.3.3 Contactors:

Contactors shall be 3 pole air break type electro- magnetic rated for 120% of the respective load current confirming to Ac-3 duty as per IS: 2959. The coil voltage shall be 240 $\pm$ 10% and be insulated with class-B material, 2 No's $\pm$ 2 NC's spare auxiliary contractors shall be provided exclusively for purchasers use for remote control or alarm/annuniciator purposes. The drop-off voltage of contractors coil shall be 40-60% of rated voltage. The main contacts will be silver plated. Contractors shall be devoid of humming noise. The make contractors shall be "Siemens' or 'Andrew Yule' or 'Cutler Hammer' or 'Larsen & Toubro'

6.9.3.4 Fuses:

All fuses shall be of high reputing capacity with duty category of 80 KA as per IS : 2208. Diezd fuses shall not be accepted. Fuses shall be either 'English Electric' or 'Siemens make' Two fuse puller for each type of fuse shall be supplied, wherever required.

6.9.3.5 Over Load Relay:

The thermal overload relay shall be triple pole, bimetallic ambient temperature compensate with built-in single phase preventor for and auxiliary contacts of 5A rating at 240 V AC. The relays

shall withstand the net through energy of associated fuse caused by short circuit current.

The overload relays shall preferably be 'Culter Hammer' make. For longer duration starting time motors, saturable C.T. operated type overload relays shall be used. The over load relay setting range shall be between 70% to 120 % of respective motor load.

6.9.3.6 Push-button Elements:

Push button shall be rated 6A, 240 V, AC spring loaded with 'NO' contact for starting and 'NC' contact for stopping. Stop push button shall be recessed type 'red' colour and start push button Mushroom type 'Green colour'

A locking arrangement shall be incorporated on the enclosure in the form of a sliding latch which will keep the knob pressed. The latch shall be made of Chromium passivated M.S. strip.

6.10 Ammeters:

The ammeters shall be taut band suspension square pattern 144 X 144 mm 240 deg. C scale, flush mounted and shall be moving iron type of metering class accuracy. Indication lamps shall be of filament type having double contact bolyonet taps and low watt consumption. This shall be provided with series resistance.

6.11 Enclosure:

The starter enclosures wherever separately mounted, shall be made of 14 SWG CRCA sheet steel and shall be totally enclosed neoprene gasketted metal clad, dust and vermin proof. Conforming to IP 54 as per IS : 2147, inscription plate shall be provided under the push button knobs having appropriate start or stop nomenclature. Besides a separate black name plate or black lamicoid material shall be screwed on to case starter indicting the tag No. of the motor being controlled. The cable entry shall be through compression type chromium plated brass cable glands.

6.12 Terminal Blocks:

The terminal blocks shall be bolted /clamp type of Elemex make and the rating shall be as under.

Power – Suitable for load as per feeder current with minimum rating of 15A. The connections shall be crimped type, tinned copper lugs.

Control – Suitable for 2.5 sq.mm copper conductor. 15% extra terminal shall be provided.

6.13 Wiring:

The various sizes of internal cabling shall be as follows :

Power – Standard copper conductor PVC cable of appropriate size.

Control circuit – 2.5 sq.mm. copper conductor PVC cable circuit.

6.14 Painting & finishes:

The starter and the frame work shall be painted with two coats of air craft grey colour of shade No. 693 as per relevant over two coats of primer after thorough pretreatment of degreasing, pickling and phosphating.

Inspection & Testing

The following tests shall be conducted on each starter.

--- Visual check

--- High voltage tests

--- Insulation resistance test with a 500 V megger

--- Operation tests.

6.15 Power and Control Cables

6.15.1 Design, manufacture and testing of power and control cables shall be in accordance with the following Indian Standards.

IS		1554	PVC insulated electric cables (Heavy duty)
IS		694 (1)	PVC insulated cable with copper conductor
IS		8130	Conductors for insulated Electric cables
IS		3975	Mild steel wires for armouring cables
IS		5831	PVC insulated and sheath of Electric cables
IS		3961	Recommended current rating of cables

6.15.2 Technical parameter:

System voltage	-	415 $\pm$ 10% phase (power cables)
		240 $\pm$ 10% , 1 phase (Control cables)
Frequency	-	50 Hz $\pm$ 5%
System Fault level	-	35 MV for 1 sec.
Insulation level	-	1100 V grade (power cables)
		650 V grade (Control cables)
Conductor temperature	-	150 deg. C (Maximum) while operating on full load prior to short circuit.
Type of conductor	-	¾ Hard drawn annealed standard aluminium conductor for power cables
		Hard drawn solid copper conductor for control cables
G.I. Armouring	-	Strip / Wire (As per IS 1554 part-I)

6.15.3 **Construction**:

All cables shall be manufactured from first quality materials, free from any defects. The conductor shall be copper or aluminium as specified, insulated with tropical grade appropriate colour, code, polyvinyl chloride compound, laid together and surrounded by extruded PVC common covering i.e. leather sheath followed by galvanised wire armouring with overall jacked of black PVC compound. Manufacturers name, voltage grade etc. shall be embossed at regular intervals throughout the length of the cable.

6.15.4 **Inspection and Tests**:

Following routine tests shall be carried out on each type length of cable.

--- Resistance test

--- Insulation test

--- High voltage test

Type test certificates shall be submitted for each type of cable.

6.16 Earthing:

Earthing system and material shall conform to IS : 3043. The earthing conductor shall be of electrolytic copper as per I.S. shall provide for grounding of each equipment including structure, vessels, tanks etc. Each Electrical equipment shall be grounded by two separate and distinct connections as per IE rules. Earth continuity shall be maintained through any metallic conduit run.

The size of copper earth flat for various equipments grounding shall be as follows:

SIZE OF COPPER STRIP / WIRES FOR EARTHING:

Earthing of cables shall be carried out as under: -

Sr.No.	Size of cable	Size of copper/switches.
1.	a) 10 sq.mm/4 core b) 16 sq.mm/4 core c) 25 sq.mm/3 ½ core d) 35 sq.mm/3 ½ core	2 nos. of 8 SWG copper.
2.	a) 50 sq.mm/3 ½ core b) 70 sq.mm/3 ½ core c) 95 sq.mm/31/2 core	2 nos of 4 SWG copper.
3.	a) 120 sq.mm/31/2 core b) 15 sq.mm/3 ½ core c) 185 sq.mm/3 ½ core	2 nos of 25 x 3mm copper.
4.	a) 225 sq.mm/3 ½ core b) 300 sq.mm/3 ½ core c) 400 sq.mm/3 ½ core d) 500 sq.mm/3 ½ core	2 nos of 25 x 6 mm copper

Earthing conductors will be tested for all routine tests as per relevant IS. The earthing system shall be tested by meggar and measurement shall be recorded and submitted for department's approval.

6.17 Accessories

6.17.1 Cable lugs, clamps, cable glands etc.

The cable lugs shall be tinned copper and soldering / crimped type of Dowels or equivalent make. Petroleum conducting jelly shall be applied on inner surface for better conductivity and to prevent corrosion at contact surface. For cables upto 95 sq.mm. cables sockets can be crimped type and for size above 95 sq.mm. the lugs shall be soldered type.

Galvanized clamps for supporting cables, conduits etc., shall be of appropriate type sample to be got approved. Galvanized horizontal or vertical cable trays shall be used as per instruction of E-I-C. PVC chord (8mm dia minimum) shall be strapped instead of clamps or saddles.

Compression type brass cable glands shall be used for cable terminations. The cable glands shall be of Siemens make or equivalent, tinned copper earthing clamps of adequate size shall be provided and connected to earth bus.

6.17.2 The conduits shall be heavy gauge, solid drawn ERW, conforming to IS : 1653. Each length of conduit shall have manufacturer's trade mark or name embossed. All burrs shall be removed at the end to prevent abrasion of cable. Bending of conduits shall be by means of manually or hydraulically operated bending machines to gives a bending radii of 10-12 times of the OD of the cables depending upon the sizes. Bends shall be free from cracks and kinks.

-----The number of wires drawn in conduit as per table indicated in drawing.

----- For size of wires not indicated in table, E-I-C shall be consulted & work to be executed accordingly.

6.18 Installation of equipment's:

Installation of various electrical equipments and accessories shall be in accordance with relevant standards, code of practice and regulation as mentioned below :

IS: 732 : Code of practice for electrical wiring installation upto 650 V.

IS : 2274 : Code of practice for electrical wiring installation upto 650 V.

IS : 1646 : Code of practice for fire safety of buildings (General) Electrical installation.

IS : 5908 : Method of measurement of electrical installation in building.

IS: 3043 : Code of practice for earthing.

IS : 5216 : Guide for safety procedures and practices in electrical works.

IS : 900 : Code of practice for installation and maintenance of A.C. Induction motors.

IS : 5224 : Code of practice for installation and maintenance of A.C. Induction motor starters upto 1000 V.

IS : 5561 : Electric power connectors.

IS : 1554: PVC insulated (heavy duty) electric cables for working voltages (Part-1) upto and including 1100 V.

Regulation : Indian Electricity Rules Factory Act and Regulations and other

& Rules statutory local, State and Municipal Regulations. National Electrical code – 1980.

6.19 **General**:

Packing materials, rust, oil or grease shall be removed from equipment prior to installation. Manufacturer recommendation as stipulated in their manuals and guideline given in subsequent clauses of this specification will be followed for installation, testing and commissioning of all the equipment. The contractor shall guarantee the installation for a period of 12 months from the date of acceptance after commissioning. Any damage or defect that may arise or be discovered or in any way be connected with the equipment or materials supplied by him or in the workmanship will be rectified or replaced by the contractor at his own expenses as deemed necessary by the owner.

In order to meet the above guarantee, good workmanship shall be the essence of installation work. As such the contractor shall employ adequate number of competent and certified personnel at site, besides qualified and experienced engineering supervisors on full time basis for inspection and supervision of work being executed. The contractor shall furnished list of team to be employed for the job along with names, specification and experience.

6.19.1 **MOTORS**:

All motors shall be mounted on a common foundation with the driven equipment either directly coupled or through bell drive. Installation shall be in accordance with IS : 900. Flexible connections shall be provided to all motor terminals whenever the motor is mounted on guide rails for belt drive motors. The connections shall be flexible enough to prevent transmission of vibration. All drive arrange arrangement and couplings shall be provided with a safety guard.

All motors shall be provided with two no separate earth connections of size specified in technical parameters.

6.19.2 **STARTERS**:

The starters shall be installed in accordance with IS : 5124. The starters shall be mounted securely in accessible location on the panel or wall near the motor at a height of 1500 mm. Design of steel brackets and support for mounting of starters shall be of approved quality and shall be painted with epoxy paint after through pretreatment on completion of fabrication. For all outdoor installation G.I. encloser shall be provided. The starter shall have push button stations for motor wherever required.

Internal wiring and mechanical operation shall be checked including setting the protection relays.

All power and control cable connections including earthing connection shall be completed.

6.19.3 CABLING:

All cables shall be laid in neat and orderly manner by skilled experienced and competent workman in accordance with standard practices. All cables shall be carefully handled specially avoiding rubbing against sharp edges in the working area. Bending radii of cables shall be 10-12 times the overall dia of armoured cables. This shall be taken care while unwinding and laying the cables in trays or conduits etc.

Each cable shall be tagged at both ends with tags made out of Aluminium strips and designation shall be in accordance with cable schedule.

All cables irrespective of type of installation shall be protected by means of G.I. pipe class B conduit or sheet steel ducts upto a height of 2000mm from floor and platforms for protection against mechanical damage.

Cables shall be laid in one piece length and no joints shall be allowed. At the cable ends suitable

loops of at least one meter length shall be kept for future requirements. Ends of cables shall be properly sealed to prevent entry of moisture prior to installation. Cable termination shall be done with suitable compression type brass glands. The armor shall be connected to the earth conductor. The insulation over each conductor upto the end where lugs shall be stripped thereon for connection. All connections shall be equipped with two plain and one spring washer to make vibration proof. Cable jointing shall be using soldering type cable sockets for cables above 95 sq.mm. size crimping shall be done by means of hydraulic crimping machine. Method of installation routing of cable etc. shall be subject to the approval of purchaser and there shall be minimum interference with buildup areas etc. The cables laid in built up trenches shall be properly fixed with angles iron /trays etc. depending upon the number of cable.

The cables laid on cable trays shall be dressed neatly avoiding cross crossings of cables and strapped on the trays at an internal of 1000mm. Power and control cables shall be separately segregated and laid. Power cables shall be laid in one layer only.

Cables or group of cables when run on structures etc. shall be provided with saddles and clamps. Clamps shall be spaced at 750mm. For vertical runs and 500mm for horizontal runs.

6.20 TOOLS AND INSTRUMENTS:

The contractor must possess necessary tools, tackles, instruments and machines (on hire or otherwise) for carrying out the installation and commissioning work.

6.21.INSPECTION, TESTING & PRE-COMMISSIONING CHECKS:

6.21.1 General:

After completion of installation work but before switching 'ON' all necessary visual /physical checks and tests shall be conducted by the contractor on each of the equipment system installed by him to ensure that complete installation conforms to IE rules and other statutory authorities.

The checks and tests shall be in accordance with the guidelines / schedule indicated here and shall cover all necessary adjusting, setting, co-ordination and calibration jobs. Any other test or repetition of any test, if required by the Electrical Inspector or any other statutory authorities prior to approval of installation shall be carried out by the contractor at no extra cost to the owner.

On satisfactory completion of testing and obtaining of necessary Electrical Inspector's statutory approval, the contractor shall render all necessary assistance to owner in commissioning the installation.

On satisfactory commissioning of the installation, the contractor shall submit to owner 'Certificate' of test and completion in triplicate on prescribed form duly countersigned by owner's authorized Engineer for the installation within 3 days of commissioning of installation.

All testing shall be scheduled by the contractor with approval of owner.

No testing shall be done in absence of owner's authorized representative. No high voltage test shall be carried out without specific permission of owner. All temporary arrangements circuit simulation and connections required for testing shall be done by the Contractor at no extra cost to owner.

Complete personnel safety and prevention of equipment damage during carrying out any test, the earthing system shall be checked and tested satisfactorily. If desired by the owner, the contractor shall submit for conducting any tests.

6.21.2 Visual Inspection

Such checks on all equipment's components shall generally be carried out in line with manufacturer's instructions, relevant standards / code of practices good engineering norms. However the specific points enumerated below shall be followed.

6.21.3 Motors:

Proper Alignment.

Direction of rotation.

Adequacy of bearing lubrication based on manufacturer's recommendations.

Tightening of all loose connections.

General checking to ensure that the motor is in satisfactory condition for testing and commissioning.

If possible, uncoupling the motor from driven equipment before energizing.

Earthing termination.

6.21.4 Starters:

Cleaning and adjustment.

Tightening of all loose connections.

Continuity of all auxiliary and control circuits.

Tightness of enclosure earth connections.

Operation of all switches, push buttons, SPP and other controlling devices.

Earthing termination.

6.21.5 Testing & Pre-commissioning checks:

For all equipment, pre-commissioning site tests shall be carried out by the contractor in line with the procedure / recommendations of relevant IS or manufacturer's instruction. However, specific points mentioned below shall in any case followed.

6.21.6 Insulation Resistance (Megger) Test

Megger tests wherever specified shall be applied only to the particular equipment which is to be tested. This equipment shall be disconnected from another equipment which may damaged by such tests. The Megger test shall be applied to rotating machines for three minutes and reading shall be taken at one minute intervals for three minutes.

6.21.7 High Voltage Test

High Voltage tests shall be carried out at specified voltage for a period of one minute in the presence of owner's engineer. As per relevant I.S.

Prior to any high voltage test, a Megger test shall be made on the equipment, which should indicate a satisfactory minimum acceptable IR Value.

After marking high voltage test, another Megger test shall be made on the particular equipment and minimum acceptable values as indicated by owner'

6.22 Acceptance:

Owner's provisional acceptance of the installation shall be subject to satisfactory materials and workmanship, successful completion of checks and tests, demonstration of satisfactory start up / commissioning and submission of proper ' Certificates' of test and completion to the complete satisfaction of E-I-C.

6.23 CABLE TRAYS (SPECIFICATION-TECHNICAL REQUIREMENT)

6.23.1 SCOPE

This specification covers the design, manufacture, testing packing and delivery to site and installation of G.I. cable pans, accessories and cable pan supports. The design manufacture, identification and testing installation of the material covered by this specification shall comply with the latest revision of the relevant Indian Standards unless otherwise stated in this specification. The cable pans shall be fabricated out of G.I. sheets free from any flaws. The M.S. sheet used for fabrication shall conform to the latest provision of Indian Standard IS : 1079.

6.23.2 Perforated type Cable Pans and Accessories

1.	Cable pans		Channel shaped side with bottom perforated G.I. Sheet fabricated out of 12 SWG (2.64 mm) single M.S. sheet
2.	Accessories		Channel shaped side members with bottom of perforated M.S. sheet
3.	Side members of accessories		Channel forms fabricated out of 12 SWG (2.64mm) G.I. Sheet.
4.	Bottom member of		12 SWG perforated G.I. sheet with perforations as pr instructions of E-I-C.
5.	Fixing of bottom members to side members		Nut bolting
6.	Fabrication		Perforations, Burns and sharp edges shall be filled after performating the sheet and the surface shall be smooth to prevent damage to cables.
7.	All corners		Smooth with radius not exceeding 6 mm.
8.	Dimensions & Details		As per requirements.
9.	Straight length of cable pan		As per requirement (but not more than 2.5 mts.)
10.	Holes for clamping side		Two 12 mm dia. Holes at either end of pans and accessories.
11.	Drilling of side		5 mm diameter tapped holes are to be provided in the top of the side members as per instructions of E-I-C for all the pans and accessories.
12.	Drilling of side members for grounding conductor & connectors		12mm diameter holes are to be provided.

6.23.3 Side Coupler

Each 2.5 M section of all types of cable pan and each elbow, tee, cross. Etc. shall be provided with side coupler plates and associated bolts, nuts and washers. The side couplers shall be fabricated from 14 SWG (2mm thick) G.I. sheet strip with two circular holes and two elliptical holes. Detailed dimensions of the strip, centre line of holes, nuts and bolts are as per instruction of E-I-C.

6.23.4 Cable Covers

Bidder shall supply sheet steel covers for cable pans and fittings where specified.. The covers shall be fabricated out of 16 guage (1.6mm thick) M.S. sheet, cable pan covers shall be the same width as the cable pans. Suitable screws with washers shall be supplied for fixing cable pan covers to the cable pan elbow, reducers, tees, crosses etc. Welding if required shall be in accordance with the latest revision of Indian Standard IS 813 and IS 816. All fabricated components shall meet the material requirements of latest revisions of relevant Indian standards.

6.23.5 Galvanising

All cables, pans and accessories including coupler plates etc. shall be hot dip galvanised after fabrication according to the latest revisions of IS 2629, 2633, 4759. The galvanizing shall be uniform clean, smooth, continuous and free from acid spots. Should the galvanizing of the samples of found defective, the entire batch of steel shall have to be regalvanised a suppliers cost. The amount of zinc deposits shall not be less than 610 grams per square meters of surface area and in addition the thickness of the zinc deposit by an Elko meter or any other instrument acceptable to Purchaser and reject any component which shows thickness of zinc at any location to be less than 75 microns.

At any spot whatsoever, shall not be less than 75 microns, for all cable pans and accessories excepted for covers. For covers the zinc deposit shall not be less than 460 grams square meters of surface area and the thickness of zinc coating shall not be less 60microns. The purchaser reserves the right to measures the thickness of zinc deposit.

Holes on all cable pans for fixing covers shall be cleaned and proper for accepting screws. The amount of zinc deposit over threaded portion of bolts nuts and screws shall not be less than 300 grams per square meters of surface area. The amount of zinc deposit for washer shall be not less than 340 gm / sq.m surface area.

Nuts, bolts, screws and washer shall be zinc electroplated in accordance with relevant standard.

6.23.6 Inspection and Tests

All material and equipment furnished and work performed shall be subject to rigid inspection by the purchaser. The supplier shall perform all the routine tests and inspection to ensure that material and workmanship are according to the relevant standards. Following tests in addition to the tests specified in relevant standards shall be conducted in the presence of purchaser's representative on the samples selected randomly from each set.

i) Visual Inspection.
ii) Dimensional checking.
iii) Copper sulphate Test (Uniformity test)
iv) Zinc coating thickness check.
v) Tripping test.

INFORMTION TO BE SUBMITTED BY TENDERER

1. **CONTROL & INSTRUMENTS**

Brief write up of control scheme including BMS compatibility and remote operation of indoor units make & Model of Major Components.

2.	**Main electrical panel :**
	a) Manufacturer
	b) Type capacity (Bus bar) amps
	c) Bus bar clearances, mm
	d) Capacity at incomer, amps
	e) Whether the following are provided
	i) O/L trip
	ii) E/F trip
	iii) U/V trip
	iv) Indicating Lamps / Alarm
	Electrical Sub Items
3	**CONTACTORS**
	a. Make & Type
	b. Rated insulation voltage
	c. Pick up voltage
	d. Drip off voltage
	e. Rated current and category of duty
4	**SWITCHES**
	a. Make & type
	b. Rated voltage & current
	c. No. of poles
	d. Neutral link (yes / No.)
5	**FUSES**
	a. Make & Type
	b. Rated Voltage & current
	c. Rated A.C. breaking in KA

6	**PUSH BUTTONS**
	a. Make & type
	b. Rated voltage & current
	c. Type of contact
7	**BIMETAL OVER LOAD RELAY**
	a. Make & type
	b. Current range
	c. Built in single phasing
	d. Protection provided (yes /No)
8	**AMMETERS AND VOLTMETERS**
	a. Make & type
	b. Applicable standard
	c. Range
	d. Dial size
	e. Class index.
9	**POWER & CONTROL**
	a. Make & types
	b. Applicable standard

INFORMATION TO BE SUBMITTED BY TENDERER WITH TECHNICAL BID (PART-II) –

Sl. No	Description	
	Outdoor Units of VRF Systems	**Data to be given for all models selected**.
1.	Model	
2.	Capacity (TR / HP and nos of compressors)	
3.	Condenser Area (air refrigerant)	
4.	Supply & operating weight	
5.	Overall Dimensions	
6.	Compressor	
	a. Model	
	b. Type	
	c. Volume efficiency	
	d. Swept Volume	
	e. Suction pressure	
	f. Discharge pressure	
7.	Name of refrigerant	
8.	Quantity of charge	
9.	Type & Qty of oil	
10.	Details of oil recovery system	
11.	Condenser fan details	
	Model	
	Size	
12.	Condenser fan motor wattage	
13.	Speed control of condenser fan motor	
14.	Condenser motor insulation	
15.	Protection for condenser fan	
16.	Class of ingress protection	

17.	Compressor suction & discharge port dia.	
18.	Base frame details of VRF outdoor unit	
19.	Power requirement for compressor	
20.	Condenser fan power	
21.	Refrigerant piping details discharge	
	a. Headers	
	b. Suction Headers	
	c. Distribution for discharge & suction	
22.	Details of Indoor units	
	Cassette type	
	a. Model	
	b. Capacity	
	c. Size	
	d. Remote control details.	
	e. CFM	
	f. Air filter details.	
	g. Cooling Surfaces area	
	1 Refrigerant side	
	2 Air side	
	h. Temperature of refrigerant	
	1 IN	
	2 OUT	
	h. Fan Details	
	1 Model	
	2 Make	
	3 Type	

	4 Motor Wattage	
	5 Type of insulation	
	6 Class of protection	
	7 Speed regulation details	
	j. Drainage pump details	
	1. Model	
	2 Type	
	3 Make	
	4 Operational details	
	k. Total weight of unit.	
23.	High wall mounted indoor units	
	High Wall mounted type	
	a. Model	
	b. Capacity	
	c. Size	
	d. Remote control details.	
	e. CFM	
	f. Air filter details.	
	g. Cooling Surfaces area	
	1 Refrigerant side	
	2 Air side	
	h. Temperature of refrigerant	
	1 IN	
	2 OUT	
	i. Fan Details	
	1 Model	

	2 Make	
	3 Type	
	4 Motor Wattage	
	5 Type of insulation	
	6 Class of protection	
	7 Speed regulation details	
	j. Total weight of unit.	
24.	Details of Condensate drainage arrangement	
	i. Piping dia	
	ii. Material	
	iii. Make	
	iv. Class of Construction	
25.	Insulation details on condensate piping as well as refrigeration pipings.	
	i. Material	
	ii. Make	
	iii. Conductivity	
	iv. Thickness	
26.	Outdoor air induction provision details for cassette type units	
27.	Mounting details of indoor units	
28.	Details of protection of refrigeration piping and platform at terrace walking	

MODE OF MEASUREMENT:

7.0 UNIT PRICES IN THE SCHEDULE OF QUANTITIES:

7.1 The item description in the schedule of quantities is in the form of a condensed resume. The unit price shall be held to include every thing necessary to complete the work covered by this item in accordance with the specifications and drawings. The sum total of all individual item prices shall represent the total price of the installation ready to be handed over.

7.2. The equipment, machinery, apparatus and include the following:-

7.2.1 All equipment, machinery, apparatus and materials required as well as the cost of any tests which the Engineer-in-charge may request in addition to the tests generally required to prove quality and performance of equipment.

All the labour required to supply and install the complete installation in accordance with the specifications, SOQ, site constraints & drawings.

Use of any tools, equipment, machinery, lifting tackle, scaffolding, ladders, etc. required by the contractor to carry out this work.

All the necessary measures to prevent the transmission of vibration.

The necessary material equipment foundations from the building structure, wherever necessary

Storage and insurance of all equipment, apparatus and materials.

The contractor's unit price shall include all equipment, apparatus, material and labour indicated in the drawings and/or specifications in conjunction with the item in question, as well as all additional equipment, apparatus, material and labour usual and necessary to make in question on its own (and within the system as a whole) complete even though not specifically shown, described or otherwise referred to.

7.3 PIPE:

7.3.1 The VRV HVAC system, refrigerant piping & drain piping, etc.

7.3.2 All the pipes shall be measured in linear meters (to the nearest cm) along the axis of the pipes and rates shall be inclusive of all fittings, e.g. Tees, bends reducers, elbows & flange etc. Deduction shall be made for valves in the line.

7.3.3 The department will leave cutouts in RCC structures on the basis of tender drawings and contractors drawings if issued in time, however, wherever necessary, if functionally required, contractor may have to make the necessary arrangements for cutouts.

7.3.4 Rates quoted shall be inclusive of providing and fixing vibration pads and wooden pieces wherever specified or required by the Project Co-ordinator, or Engineer-in-charge.

7.3.5 Flexible connections, wherever required or specified shall be measured as part of straight length of same diameter, with no additional allowance being made for providing the same.

7.3.6 The length of the pipe for the purpose of payment will be taken into account through the centre-line of the pipe and all fittings (eg. Tees, bends, reducers, elbows, etc.) as through the fittings are also presumed to be pipe lengths. Nothing extra whatsoever will be paid for over and above for the fittings for the valves.

The rate shall inclusive cutting holes in walls and making good the same and inclusive of all items as specified in specification and schedule of quantity.

7.4 STRUCTURAL SUPPORTS

Structural supports including supports fabricated from pipe lengths for pipe shall be measured as part of pipe line and hence no separate payment will be made. Rates shall be inclusive of hoisting, cutting, jointing, welding, cutting of holes and chases in the walls, slabs or floors, painting supports and other items as descried in specifications, drawings and schedule of quantities or as required at site by Project Coordinator.

7.5 PAINTING:

Painting of all pipes, valves and fittings shall be measured as part of pipes as installed. Nothing extra shall be paid for this work.

Painting of tanks and equipment wherever required shall be measured as a part of equipment price.

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SCHEDULE OF APPROVED MAKES

Note: The Contractor should obtain prior approval from Architects before placing orderfor any specific material / agency.

LIST OF RECOMMENDED MATERIAL OF CIVIL & FURNITURE WORK

1	COMMERCIAL PLY (MR-303)	Greenply/ Anchor / Samrat/ Century/Kutir
2	FLEXI PLY (MR-303)	Greenply/ Anchor / Samrat/ Century/Kutir
3	LAMINATES (1.00 mm thk)	Greenlam / Advance /Aica / Dorby mica / Royal Touch/ Marino.
	0.8 mm thk. Laminate	Century/ Heritage / Durian
4	VENEER	Greenlam / Durian / Kutir
5	WOOD (Well Seasoned)	C.P.T.W. / Malayasian /African
6	SCREWS, NAILS & OTHER ACCESSORIES	GKW/Nettle Fold or Equivalent.
7	BRASS HINGES (Heavy Duty)	Kich/haffle/Hettich/Doorset/Enox or equivalent
8	DRAWER SLIDING FITTINGS (TELESCOPIC)	Kich/haffle/Hettich/Doorset/Enox or equivalent
9	HARD WARE	Kich/haffle/Hettich/Doorset/Enox or equivalent
10	DRAWER SHUTTER / LOCK	Kich/haffle/Hettich/Ebco or equivalent
11	BALL CATCH	Magnetic (M.2.) / Brass
12	DOOR LOCK / HANDLES	Kich/haffle/Hettich/Doorset/Enox or equivalent
13	DOOR CLOSUER	Dorma/Ozone/Enox/Doorset/Haffele Or equivalent
14	FLOOR SPRING	Dorma/Ozone/Enox/Doorset/Haffele Or equivalent
15	ADHESIVE	Fevicol/Araldite/Anchor or Equivalent
16	STAINLESS STEEL	Salem / Japan 16 gauge thick.
17	GLASS TINTED / MIRROR	Saint Gobian / Asahi India
18	GLASS TINTED	Saint Gobian / Asahi India
19	MELAMINE ACRYLIC POLISH	Asian / British Paint / Fevelite.
20	ALUMINUM GRILL	Alumgrill
21	P.V.C. Flooring	Hanwha / Armstrong / L.G.
22	WOODEN LAMINATE FLOORING	Pergo/Armstrong/Euro or equivalent
23	FALSE FLOORING	D.G. / NEP Floor

PAINT

1	PLASTIC EMULSION	Asian/Nerolac//Berger or equivalent
2	SYNTHETIC ENAMEL PAINT	Asian / Nerolac / British Paint.
3	TEXTURE PAINT	Birla / Nitco / Spectrum
4	CEMENT PAINT	Snowcem, Nitcocem, Birla, ICI, Asian, Nerolac, British.
5	ALUMINUM METAL FALSE CEILING	Armstrong/Unimech/AMF
6	FIBRE MINERAL FALSE CEILING	Hunter Douglas / AMF
7	ALUMINUM DOOR & WINDOW SECTION	Jindal / Indal
8	UPHOLSTERY	Golden / Vimal / Orkay / Raymond / Champagne.
9	WOOD PRESERVATION	Asian Paints / British Paint / Pest Control of India
10	VERTICAL BLINDS	Vista, Mac, Luxaflux, Aerolux.
11	VENETIAN BLINDS	Vista, Mac, Luxaflux, Aerolux.
12	CEMENT	Ultratech/ACC/JK Cement/Ambuja
13	SUN CONTROL FILM	Lunar / Birla 3M
14	STAINLESS STEEL SINK	Nirali / Diamond.
15	PLANTS (Artificial)	China / Taiwan.
16	PICTURES	Selection from Sadguru& Paint Rhythm.
17	AIR CURTAIN	Air Pack / Crompton / Russel.
18	CARPET	Unitex/Armstrong or equivalent
19	CASTORS	Relaxo / Paramount.
20	CERAMIC TILES/ (Flooring)	HR Johnson/Kajaria/RAK or equivalent
21	CERAMIC TILES (Dado)	HR Johnson/Kajaria/RAK or equivalent
22	VITRIFIED FLOORING	HR Johnson/Kajaria/RAK or equivalent
23	GRANITE TILES	South Quarrys (Banglore / Manglore)
24	"U" FOAM	Prince / Supreme / Swastik.
25	POLYURETHANE FOAM	Sleepwell
26	SOFT BOARD	Jolly Board
27	GLASS WOOL	Fibre Glass / Pilkington.
28	ALUMINUM COMPOSITE PANEL	Al-Strong / Alucobond / Allu-bond/Flexi Bond/Alto-bond
29	TOUGHENED GLASS	Saint-Gobain/Indo Asahi/Modi or equivalent
30	ACRYLIC SOLID SURFACE	Dupont/ Merino/ Hi-Mac or equivalent

LIST OF MAKE FOR PLUMBING WORKS

S.no	Material		Brand/ Manufacturers OR EQUIVALENT
1	Stainless Steel Sink	:	Nirali
2	Sanitary Ware	:	Hindware/Jaquar
3	Plastic seat cover of W.C	:	Hindware/Jaquar
6	Centrifugally /Sand cast iron pipes &fittings	:	Neco, Hepco
7	G.I. Pipes	:	Jindal-Hissar, Tata, Prakash-Surya B.S.T.,SAIL,
8	G.I. Fittings	:	Jindal-Hissar, Tata, Prakash-Surya B.S.T.,SAIL,
9	Gunmetal Valves	:	Zoloto, Leader,
10	Brass stop & Bib Cock	:	Hindware/Jaquar
11	Ball valve with floats	:	Zoloto, Leader, Sant, Jayco
12	Stoneware pipes & Gully Traps	:	IS Marked pipes
13	R.C.C. pipes	:	IS Marked pipes
14	D.I. Manhole Covers	:	RIF, NECO,
15	Water Tank	:	Sintex, Polycon, Uniplast
16	Mirror	:	Golden, Atul, Modi guard ,Gujrat Guardian
17	Hand drier	:	Kopal, Automat, Euronics
18	PVC flushing cistern	:	Parryware, Hindware,Jaqvar

19	Insulation of Hot water pipes	:	Vidoflex insulation, Superlon insulation orequivalent
20	PVC Rain Water Pipes.	:	Supreme, Prince, Finolex. Astral
21	Sluice valve / NRV	:	Kirloskar, Kilburn, Zoloto ,Castle,
22	Water supply pumps	:	KIRLOSKAR, WILO, GRUNDFOS
23	UPVC pipes & fittings	:	FInolex , Prince, Supreme, Astral
24	Chlrorinator	:	ALFA, USA, Ion exchange, Sigma DHCombine Inc.
25	HDPE Solution tank	:	WATCON, ION EXCHANGE, Water Supply Specilist P (Ltd)
26	C.P Flush Valves	:	Jaquar, Seiko, Nelson
27	C.P Angle Valves, bib cock	:	, Jaquar, Seiko ,Nelson
28	Level controller	:	Femac or equivalent
29	Drainage Pumps	:	Grundfos, KSB, Kirloskar
31	R.O System	:	Thermax, Aqua Process, Ion-Exchange,Akar- Impex, Polycon Technologies, Fontoos
32	PE-AL-PE	:	Kitec, Jindal, NEXGEN
33	HDPE pipes and fittings	:	Oriplast, So-Soon, Finolex
34	Infrared Sensor operated Urinals	:	Jaquar, Euronics,U-tec
35	Grab Bars	:	Marino or equivalent
36	CPVC pipe	:	Prince, Supreme,Finolex, Astral
37	Solar Panel	:	Tata BP, BHEL, EMMVEE
38	Copper Pipe	:	Raj Co., Maxflo
39	Copper Fittings	:	Viega, IBP
40	Lab drainage	:	Viega or Equivalent as approved.
41	Lab Fittings	:	Vijay, Viega, or equivalent
42	CP Grating for Floor Trap		Chilly,Cardin, Cammry
43	UPVC Over Head Water Tank		EURO, SYNTEX, DIPLAST

LIST OF MAKE FOR ELECTRICAL WORKS

SR. no	Material	Brand/ Manufacturers OR EQUIVALENT
1	CABLES ISI MARK, 1100V (GRADE FR)), XLPE	KEI, POLYCAB, RRKABLES
2	WIRES: 1100V/660V GRADE FRLS	KEI, RRKABLES,FINOLEX, POLYCAB,
3	PVC CONDUITS & ACCESSORIES	PRECISION, SUPREME,AKG
4	6A / 16A MODULAR SWITCHES &SOCKETS, ISI MARK	CRABTREE ,M.K.INDIA, LEGRAND
5	DISTRIBUTION BOARDS, MCB's – 10.0KA	LEGRAND, HAGER, SCHNEIDER
6	ELCB/RCCB/RCBO – 10.0KA.	LEGRAND, HAGER, SCHNEIDER
7	ELETRICAL FITTINGS	PHILIPS, WIPRO
8	HRC SWITCH FUSE UNITS	GE, L&T, SIEMENS, ABB
9	CABLE GLANDS & LUGS	BRACO, DOWELS.
10	INDUSTRIALSOCKETS	LEGRAND,SCAME, NEPTUNE
11	FLOURESCENT TUBES & BULBS	PHILIPS, OSRAM.
12	CONTACTORS	L&T,MERLINGERIN, LEGRAND
13	ACB / MCCB	L&T, LEGRAND, HAGER, SCHNEIDER
14	C.T	INDCOIL, MECO
15	CAPACITOR	SUBODHAN, L&T
16	P.F. RELAY	TRINITY, ENERCON, SECURE, L&T
17	ALUMINIUM RACEWAYS	JINDAL, INDAL.
18	MANUAL CHANGE OVER SWITCH	L&T,MERLINGERIN, LEGRAND
19	RG59 OUTLETS	KEI, RRKABLES,FINOLEX, POLYCAB, RAJANIGANDHA
20	RACEWAYS / CABLE TRAYS	PROFAB,ASIAN,SHIVSHAKTI
21	PANEL ACCESSORIES	L&T, SIEMENS, MG,GE
22	LOAD MANAGERS & EM	TRINITY , HPL ,ENERCON,SECURE,
23	TVSS/ SPD	LIBERT(ASCO),LEGRAND,SCHNEIDER

APPROVED MAKES OF MATERIALS OF AIR-CONDITIONING

Sr No.	Material	Brand/ Manufacturers OR EQUIVALENT
1.	VRF Systems	HITACHI / Daikin / Mistubushi
2.	Indoors Hi-Wall & cassette type unit	HITACHI / Daikin / Mistubushi
3.	Ductable / Splits / Window Air-conditioners	HITACHI / Daikin / Mistubushi
4.	Grilles & Diffusers.	Cosmos / Air Master / Dynacraft / Air Product
5.	Air Handling Units.	Nutech / HPS / Carryaire
6.	Collar / Volume Dampers	Cosmos / George Rao / Carryiare / Air Master.
7.	Propeller Exhaust fans	GEC/ crompton
8.	Centrifugal fan / Inline / Axial	Kruger / COMEFRI / NICOTRA /NADI
9.	Motors	Siemens /ABB/ Crompton/ AUE
10.	Starter / contactor	Siemens /L& T / Cutler Hammer
11.	Air Filter	Air tech / Johan flower / Pure Air
12.	Insulation fiber glass	UP Twiga / kimco
13.	Expanded Polystryene	Beardsell / Lloyd
14.	Phenotherm / Nitrile Rubber	Hylam/Superlon/Armaflex/Trocellen
15.	GSS Sheets	Jindal/SAIL
16.	Vibration isolation	Dunlop / Cushy Foot / Resistroflex
17.	Control cable	Finolex / CCI / Polycab / Universal
18.	Power cable	ICC/Asian cables / Polycab / /Incab/Siemens/Universal
19.	HRC fuses	EE/L & T / Siemens
20.	Timer	Siemens/ L & T/EE/Cutler Hammer
21.	Termining block	Elmex
22.	G.I. sheets	Tata /SAIL/Jindal
23.	Copper Refrigerant Piping	Mandev Tubes / Rajco / Indigo Metalloys / Janya.
24.	Refrigerant Piping Insulation	Vidoflex / Supreme
25.	PVC Drain Pippe	Prince / Supreme
26.	Thermostat	DAN Foss/RANCO/ Cutler Hammer

27.	Humidistat	Penm/Honeywell/RANCO
28.	Solenoid valve	Sporlan
29.	Thermostat expansion valve	Sporlan /Danfoss/ ALCO
30.	Air Flow Control Regulators.	Aldes / Trox.
31.	Flexible Insulated Ducts	Bailiwick India.
32.	Indoor Air Quality (Air Ozone InjectionSystem)	Ruks /Trimed.

Primary Details of the Bidder

Name of the Bidder	
Address	
Email id	
Contact Details	
Year of Establishment:	
Status of the Firm : Proprietary / Partnership / Pvt.Ltd./Pub. Ltd.	
Registration number and date with Registrar of Companies/Firms :	
PAN Card Number :	
GST Number :	
Name Of the banker	
Account Number	
IFSC Code	
Type of account	

MANDATORY INFORMATION REQUIRED FOR PREQUALIFICATION OF THE BID

S.No.	Eligibility Criteria for the Bidder	Complied (Yes/No)	Documents Required(tobe uploaded)
1	The bidder should be on empanelment with banks/Financial Institutions/Insurance Companies/PSU		Valid Empanelment letter.
2	Current solvency certificate from your Banker only for notless than 50% of estimate value :		Banker Certificate only
3	Value of the total work done till date		Supporting document
3.1	At least particulars of minimum 1 successfully completed similar work during last seven years amounting to 80% of estimate value or more: Successful completion Certificate from clients is mandatory.		Successful completion Certificate from clients
	OR		
3.2	At list particulars of minimum 2 successfully completed similar works during last Seven years amounting to 50% of estimate cost or more: Successful completion Certificate from clients is mandatory.		Successful completion Certificate from clients
	OR		
3.3	At list particulars of minimum 3 successfully completed works during last Seven years amounting to 40% of estimate cost or more: Successful completion Certificate from clients is mandatory.		Successful completion Certificate from clients
3.4	Whether Solvency certificate (for minimum **Rs. 50 Lacs)** enclosed (Valid till completion of work)		
3.5	Annual Turn-over during the last 3 financial years (**in Rs. 55 Lacs/-**) (Attested by Chartered Accountant)		i) FY YEAR 2020-2021 Rs_____ ii)FY YEAR 2021-22 Rs_____ iii)FY YEAR 2022-23 Rs_____

4	For electrical work, valid license from State Government ismust. Subletting is allowed for only Electrical, data cablingand Lighting Fixtures. Sub contractor's license can also be submitted for this purpose but final liability of work will beof main Contractoronly.		Valid electrical license from State Government
5	Have you in past carried out any works for Financial Institutes/Nationalized Banks/ PSUs or its subsidiaries?		Successful completion Certificate from clients
6	Have you been ever disqualified or blacklisted or leviedpenalty by the Organization/Bank/PSUs in past for non-fulfilment of the contractual obligations. If yes, please provide details in brief.		Self-declaration on letterhead of bidder

Bidders meeting the above mentioned criteria are eligible to submit their bids alongwith supporting documents. If the Bid is not accompanied by all the required documents supporting eligibility criteria, the same would be rejected.

I/We confirm that to the best of our knowledge this information is authentic and accept that any deliberate concealment will amount to disqualification at any stage.

Note: Similar works means, the vendor should have completed comprehensive work consisting of furniture work, false ceiling work, modular work stations and electrical, data cabling, computer wiring, Distribution board/panel board & lighting fixtures wok being the selection criteria.
Seal and Signature of the Bidder/s.

Date:

Place:

Annexure-1-(Technical Bid)

THE NEW INDIA ASSURANCE CO. LTD

<table>
<tr><td>S.No.</td><td colspan="3">ESSENTIAL/MANDATORY DOCUMENTS/CRITERIA</td><td></td></tr>
<tr><td>1</td><td colspan="3">Name and Address of the contractor</td><td>Address proof to be attached(mandatory)</td></tr>
<tr><td>2</td><td colspan="3">PAN No & GST</td><td>Copy of each to be attached (mandatory)</td></tr>
<tr><td>3</td><td colspan="3">Tender Fee (Rs 1770/-)</td><td>Scanned copy to be attached online and hardcopy to be submitted to office
(MSE are exempted) (MSE must submit scanned MSE certificate for claiming exemption) (mandatory)</td></tr>
<tr><td>4</td><td colspan="3">EMD (Rs 1,80,0000/-)</td><td>Scanned copy to be attached online and hardcopy to be submitted to office
(MSE are exempted)) (MSE must submit scanned MSE certificate for claiming exemption) (mandatory)</td></tr>
<tr><td rowspan="2">5</td><td colspan="3">Similar Works (Interior furnishing works)</td><td rowspan="2">Certificates/work completion certficates to beattached for similar work (merely work orderswill not be considered)
(mandatory)
[Please note that the qualifying value shouldcorrespond to one single work /two single works/three single works (i.e. the bidder should not combine value of different small
works to show as value of single work]</td></tr>
<tr><td>1 similar work amounting to 80% ofestimated value</td><td>2 similar works amounting to 50% of estimatedvalue</td><td>3 similar works amounting to 40% of estimatedvalue</td></tr>
<tr><td>6</td><td colspan="3">Self declaration regarding not disqualified/not blacklisted byany organization/bank in the past</td><td>To be attached (mandatory)</td></tr>
<tr><td>7</td><td colspan="3">Balance sheet/ Profit & Loss Statement for the last 3 years. (
to be attached herewith)</td><td>To be attached (mandatory)</td></tr>
</table>

Date:- **Place:-**

ANNEXURE - 2

(SECURITY DEPOSIT-BANK GUARANTEE PROFORMA)

To,

The Chief Regional Manager,

Corporate & Broker's Office (CBO II),

Ground Floor, New India Center,

Dr. Babasaheb Ambedkar Chowk,

Cooperage Road, Colaba,

Mumbai, Maharashtra 400001

WHEREAS

M/S , (hereinafter called "the Contractor") has undertaken,in

Pursuance of TenderReferenceNo.....dated to undertake workstitled

"......"

AND WHEREAS it has been stipulated by you in the said Tender that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein, as security for compliance with the contractor's performance obligations in accordance with the contract.

AND WHEREAS we have agreed to give the contractor a guarantee:

THEREFORE, WE hereby affirm that we are Guarantors and responsible to you, on behalf ofthe Contractor, up to a total of Rs.....(in words.....) and weundertake to pay you, upon your first written demand declaring the contractor to be indefault Under the Tender and without cavil or argument, any sum or sums within the limit of Rs /-

(Amount of Guarantee) as aforesaid, without your needing to prove or to show grounds orreasons for your demand or the sum specifiedtherein.

This guarantee is valid until the.....

Signature and Seal of Guarantors (Contractor's Bank) Date:

Address

ARTICLES OF AGREEMENT

(**On STAMP PAPER of Rs.200/-**)

ARTICLE OF AGREEMENT made this .....day of **TWO THOUSAND TWENTY FOUR (2024)** BETWEEN the **The New India Assurance Co. Ltd.**, a company incorporated and registered under the Companies Act, 1956 and having its registered Regional office at The New India Center, **Corporate & Broker's Office (CBO II), Ground Floor, New India Center, Dr. Babasaheb Ambedkar Chowk, 17-A, Cooperage Road, Colaba, Mumbai, Maharashtra 400001**. hereinafter called "Employer" (which expression shall include its successors and assigns wherever the context or meaning shall so require or permit, of the one part and .... (hereinafter called the "Contractor") (which expression shall include its successors and assigns wherever the context or meaning shall so require or permit) of the other part.

WHEREAS the Employer is desirous of carry out the Proposed Civil, Interior Furnishing, Electrical, Air Conditioning, Networking and Allied work (on Turnkey Basis) at Ground floor, (erstwhile Ravissant Premises), New India Center, Dr. Babasaheb Ambedkar Chowk, 17-A, Cooperage Road, Colaba, Mumbai, Maharashtra 400001.

as mentioned, and has got drawings, specifications and the bill of quantities prepared by their Architects/Consultants, which have been signed or on behalf of the parties hereto.

AND WHEREAS the Contractor has agreed to execute upon and subject to the conditions set forth herein and to the conditions set forth in the special conditions and in the Bill of Quantities and conditions of contract (all of which are collectively hereinafter referred to as "The said terms & conditions", the works, shown upon the said drawings and/or described" in the said specifications and included in the said bill of quantities at the respective rates therein set forth amounting to the sum as therein arrived at or such other sum as shall become payable there under (herein after referred to as the said "contract value").

NOW IT IS HEREBY AGREED AS FOLLOWS:

01. In consideration of the said Contract Value to be paid at the times and in the manner set forth in the said terms & conditions; the contractor shall upon and subject to the said terms & conditions execute and complete the works shown on the said drawings, and described in the specifications and/or bill of quantities.

02. The Employer shall pay the contractor The Said Contract Value or such other sum as shall become payable at times and in the manner specified in the said terms & conditions.

03. The said terms & conditions and Appendices thereto shall be read & construed as forming part of this Agreement and the parties hereto shall respectively abide by submit themselves to the said terms & conditions and perform the agreements on their part respectively in the said terms & conditions contained.

04. The contract is neither a fixed lump sum a contract nor a piece work contract but is a contract to carry out the work in respect of the entire work as defined in the contract documents to be paid for according to actual measured quantities at the rates contain in the bill of quantities or as provided in the said contract documents.

05. The contract shall afford every reasonable facility for the carrying out of all works relating to DG Sets in the manner laid down in the said conditions, and shall make good any damages done to walls, floors, etc. after the completion of such works.

06. The Employer reserves to itself the right of altering the Drawings and nature of the work by adding to or omitting any items of work or having portions of the same carried out without prejudice to this Contract.

07. Time shall be considered as the essence of this Contract and the Contractor hereby agrees to commence the work from date of Letter of Acceptance and to complete the entire work within **8 WEEKS** subject nevertheless to the provision for extension of time.

08. All payments by the Employer under this contract will be made only at Mumbai.

09. All disputes arising out of or in any connected with this agreement shall be deemed to have arisen at Mumbai and only court in **MUMBAI** shall have jurisdiction to determine the same.

10. That the several parts of this Contract have been read by the Contractor and fully understood by the Contractor. The Contractor shall not be entitled for the payment for the quantities beyond the tendered quantities unless ordered for by specific written instructions from the engineer.

IN WITNESS WHEREOF THE Employer and the Contractor have set their respective hands to these presents and two duplicates hereof the day and year first hereinabove written. (If the contractor is a partnership or an individual).

IN WITNESS WHEREOF the Employer has set its hand to these presents through its duly authorized official and the Contractor has caused its common seal of to be affixed hereunto and the said two duplicates/has caused these presents and the said two duplicates hereof to be executed on its behalf, the day and year first hereinabove written (If the Contractor is a company).

Signature Clause

SIGNED & DELIVERED by the **The New India Assurance Co. Ltd.** by the hand of

Shri_____
(Name and Designation)
_____ in
the presence of
(1)_____

Address_____

(2)_____

Address_____

Witness

SIGNED AND DELIVERED BY _____ in the presence of

If the party is a partnership firm of an individual should be signed by all or on behalf of all partners.

(1) _____

Address _____

(2) _____

Address _____
Witness

THE COMMON SEAL OF _____
Was hereunto affixed pursuant to the resolutions passed by its Board of Directors at the meeting held on _____ in the presence of

(1) _____

(2) _____

Directors who have signed these presence in token thereof in the presence of

(1) _____

(2) _____

If the contractor signs under its common seal the signature clause should tally with the sealing clause in the Articles of Association.

SIGNED AND DELIVERED by the contractor by the hand of Shri _____
And duly constituted attorney

If the Contractor is signing by the hand of power of attorney whether a company or individual.

ANNEXURE 4 PRICE BID

SUMMARY

No.	Particulars	Amount (Exclusive of GST)	Amount (Exclusive of GST) in words
A	DISMANTLING WORK	0.00	
B	CIVIL WORK	0.00	
C	FURNITURE WORK	0.00	
D	ELECTRICAL WORK	0.00	
E	NETWORKING WORK	0.00	
F	AIR CONDITIONING (HVAC) WORK	0.00	
	TOTAL	0.00	
GST WILL BE EXTRA AS APPLICABLE			

S.No.	Description of items	Qty	Unit	Rate	Amount	Amount (Rs) in words
DISMANTLING WORK						
(A)	DISMANTLING WORK					
A01	Removing the existing damaged marble flooring					
	Remove the existing damaged marble flooring & raceway flooring along with bedding material etc. and carting away the unserviceable materials out of compound, cleaning the site etc. complete as per site requirement and instructions of Architect / NIACL Engineer.					
	(Mode of Measurement : Length X Width)	110.00	SMT		0.00	
A02	Removing of existing Glass panel from external façade					
	Remove the existing glass panel including its fitting and carting away glass panels out of the site & dump at municipal dumping ground. etc. complete as per instructions of Architect / NIACL Engineer.					
	(Mode of Measurement : Length X Width)	17.00	SMT		0.00	
A03	Removing of existing Toilet fittings & fixtures (Ground & First Floor Toilet)					
	Removing existing Kithen Platform, Basin counter, toilet fittings & fixtures, external, internal G.I. , C.I., PVC Pipe line, drain line & carting away debries at municipal dumping ground. etc. complete as per instructions of Architect / NIACL Engineer.					
	(Mode of Measurement : JOB)	1.00	JOB		0.00	
A04	Removing of existing granite / marble counter along with wash basin					

	Remove the existinggranite / marble counter along with wash basin, wall cladding, window cill along with back coat of plaster restore the same for applying new plaster and carting away debries at municipal dumping ground. etc. complete as per instructions of Architect / NIACL Engineer.					
	(Mode of Measurement : Length X Width)	4.00	SMT		0.00	
A05	Removing existing toilet flooring along with waterproofing treatment					
	Remove the existing all types of flooring along with existing waterproofing traetment from both the toilet (Gents & Ladies), Pantry i.e. Drinking water area along with the bedding material and carting away debries at municipal dumping ground. etc. complete as per instructions of Architect / NIACL Engineer.					
	(Mode of Measurement : Length X Width)	24.00	SMT		0.00	
A06	Removing of existing wall dado					
	Removing of existing toilet dado with back coat of plaster restore the same for fixing of new tiles and carting away debries at municipal dumping ground. etc. complete as per instructions of Architect / NIACL Engineer.					
	(Mode of Measurement : Length X Width)	85.00	SMT		0.00	
A07	Removing of existing Toilet door with Granite frame					
	Carefully removing of existing all types of doors & windows along with the granite frames as per site requirement and carting away debries at municipal dumping ground. etc. complete as per instructions of Architect / NIACL Engineer.					
	(Mode of Measurement : Length X Width)	11.00	SMT		0.00	
A08	Dismantling of existing brick wall					

	Carefully dismantle the existing brick wall of cement block / siporex block of all thickness including finishing material, plaster etc. and carting away debries at municipal dumping ground. etc. complete as per instructions of Architect / NIACL Engineer.					
	(Mode of Measurement : Length X Height)	50.00	SMT		0.00	
A09	Remove existing all types of elec. cable tray, cables, light fittings above flase ceiling and underfloor raceways and handover the servicable material to NIACL and cating away debries out of the site.					
	Removing of existing all types of cables, wire, panels, light fitting ,boards from above the false ceiling and underfloor raceways and carting away debries at municipal dumping ground. etc. complete as per instructions of Architect / NIACL Engineer.					
	(Mode of Measurement : Length X Width)	320.00	SMT		0.00	
	DISMANTLING WORK				**0.00**	
	GST WILL BE EXTRA AS APPLICABLE					

S.No.	Description of items	Qty	Unit	Rate	Amount	Amount (Rs) in words
(A) CIVIL & PLUMBING WORK						
A01	2" THK. P.C.C. (1:3:6)					
	Providing & laying 4" thick plain cement concrete for leveling the surface with cement mortar as per site requirement, curing, cleaning and removing the unserviceable material out of the compound etc. complete as per the instruction of the Architect/ NIACL Engineer.					
	Mode Of Measurement - Length X Width	30.00	SMT		0.00	

A02	Toilet Waterproofing					
	Providing and Laying cement based patented waterproofing treatment to the floors of toilet blocks, pantry, kitchen after removing the existing water proofing treatment OR floors with bedding upto the top of the slab, cleaning the surfaces of muds, sand, other particles & apply 3 coats of POLYALK WP and cement in proportion 1:1.25 by weight for first coat and 1: 15 for second coat and provide 150mm thk. brick bat coba in Cement Mortar (1:3) of two parts of bricks & one part of mortar laid in proper slope along with watta at junction of walls upto 300 mm in height including making inject grouting in the existing slab with SUNEPOXY 368 of proportion (3:1) or as per Manufacturer's Specification carting away debris out of compound, cleaning the site etc. complete as per instructions of Architect/Engineer /SBIIMS..					
	(Note:-10 Years Guarantee For Waterproofing on appropriate Court Fees Stamp Paper)					
	Mode Of Measurement - Length X Width	24.00	SMT		0.00	
A03	Toilet Waterproofing (Verticle Surface)					
	Do-do-as above item no. A02, but without brick bat coba and apply waterproofing treatment to vertical surfaces of wall as per instruction of the Architect / Engineer.					
	(Mode Of Measurement - Height X Width)	14.00	SMT		0.00	
A04	6" Thk. Siporex Wall					
	Providing and Constructing 4" thick SIPOREX block wall made out of 450mm X 225mm X 100 mm thick siporex block masonary in Cement Mortar (1 : 4) with necessary scaffolding, racking out joints, curing, carting away debris out of compound cleaning site etc. complete as per instructions of the Architect / Engineer.					

	Mode Of Measurement - Length X Height	8.00	SMT		0.00	
A05	Filling Cavity with Siporex					
	Providing & Laying in line & level upto average 225 to 300 mm deep light weight siporex block filling to raise toilet blocks with waterproofing Cement Mortar (1:4) including 75 mm thick top layer in Plain Cement Concrete (1:2:4) mixed with waterproofing compound as per the Manufacturer specification, carting away debris out of compound, cleaning the site etc. complete as per instructions of Architect/Engineer .					
	Mode Of Measurement - Length X Width	33.00	SMT		0.00	
A06	Waterproof Plaster					
	Providing 12mm to 15mm thick Single coat waterproof cement plaster in cement mortar (1 : 3) on the wall, R.C.C. Frame work OR behind tiling dado inclusive of patent waterproofing compound in the cement as per the Manufacturer's specifications, curing, scaffolding etc. complete as per the instructions of Architect / Engineer.					
	Mode Of Measurement - Length X Height	90.00	SMT		0.00	
A07	Waterproof plaster with gypsum finish					
	Carefully removing the existing all types of plaster, Providing waterproof plaster with gypsum finish to Walls, Beams, Columns, Slabs, Pardi etc. in FIRST coat of 12mm thick to 15mm thick waterproof cement plaster in Cement Mortar (1:3) and second coat of 8mm thick to 10mm thick gypsum finish in all level and lines making grooves etc. as per the site requirements including scaffoiding, curing, cleaning, carting away debris out of compound cleaning the site etc. complete as per instructions of the Architect .					

	Mode Of Measurement - Length X Height	45.00	SMT		0.00	
A08	18 mm thk. Granite cill in step design (Architrave) to door (200 mm wide)					
	Providing & Laying in required position regular BLACK Granite slab 20mm to 25mm thk & 200 mm wide for door cil in one piece with one side moulding fixed on 1:4 cement mortar including filling joints with colored cement slurry, curing, rubbing, polishing and cleaning, scaffolding etc. complete as per instruction of the Architect / Engineer.					
	Basic Rate: Rs. 2200/- SMT					
	Mode Of Measurement - Per Running Length	35.00	RMT		0.00	
A10	Anti Skid Flooring					
	Providing & Laying 600MM X 600MM X 8mm to 10mm thick full body double charge Italian marble finish Vitrified tiles in approved colors to floor in required position fixed with bed of Cement Mortar (1:4) about 50mm to 75mm thick including 4mm to 5mm thk. float of cement, filling the joints with neat matching color cement slurry, rubbing, washing, carting away debris out of the compound, cleaning the site etc. complete as per instructions of the Architect.					
	Cost to be inclusive of taping on all the joints & covered the entire flooring with good quality plastic (300 microns) & POP above. Cover & Tape to be removed before final cleaning etc. complete as per detail drg. & instruction of the Architect.					
	Basic Rate: Rs. 750/- Per SMT					
	Mode Of Measurement - Length X Width	24.00	SMT		0.00	
A11	Vitrified Tile Dado					

	Providing & Fixing approved color ceramic tiles 600 X 600mm or 300 x 600 mm first quality with design for dado and skirting in required position with back coat of plaster, float of cement, including filling joints with coloured cement slurry, curing, cleaning etc. complete as per instruction of the Architect.					
	Basic Rate: Rs. 760/- Per SMT					
	Mode Of Measurement - Length X Width	95.00	SMT		0.00	
A12	Granite Counter for wash basin					
	Providing and Fixing 675 mm deep Granite counter for wash basin made out of 38 mm thick kadappa frame work for bottom and sides 18mm thick approved color granite shall be fixed with 10mm to 12mm thick float of cement slurry on the kadappa with making necessary cut out shall for fixing of wash basin & pillar tap, 150 mm wide granite facia horizontally on wall and counter front vertically as bottom of the counter two sides, carting away debris out of site etc. complete as per instructions of Architect/Engineer .					
	(Basic Cost Rs.2400 /- Per SMT)					
	Mode Of Measurement -Per Running Length	5.00	RMT		0.00	
A13	Glass Urinal Divider					
	Providing & Fixing urinal partition made out of 12mm thick Saint Gobain / Asahi India make frosted glass of overall size 650 X 1350 mm fixed with Stainless Steel 316 Grade patch fitting along with stainless steel brackets at bottom etc. complete as per the detail drawing & instructions of the Architect / Engineer.					
	Mode Of Measurement - Per Nos.	3.00	No.s		0.00	
A14	8 mm thk. Mirror with fix with SS Stud					

	Supplying & Fixing Mirror made out of 8mm thk imported plate glass, silvered, with beveling fixed over 12mm thick marine ply wood applying 2 coats of Enamel paint over 1 coat of wood primer to plywood fixing the mirror with 20 mm dia. &50 mm deep stainless steel studs in 4 Nos. for fixing etc. complete as per site requirements & instructions of the Architect.					
	Mode Of Measurement - Length X Height	6.50	SMT		0.00	
A15	Polymer concrete to RCC Framework					
	1) Rust remover - Brushing with wire rush and removing all rust scales from rebar's and washing with water as required and providing and applying Rust Remover on existing exposed reinforcement bars.					
	2) R.I. Coat - Providing and applying Rust inhibition Coat / system to exposed rebar's and also new rebar's complete.					
	3) Bond Coat - Providing and applying raw polymer bond coat / system to all exposed concrete surfaces and rebar's prior to polymer treatment complete.					
	4) Polymer Modified Mortar - Providing and applying polymer modify mortar in ratio 1: 5 : 15 (one part - By weight of polymer : 5 parts By weight of Cement : 15 parts By weight of Quartz Sand) upto 25mm thick of two coats OR as per directed by Architect / Engineer .					
	Mode Of Measurement - (Length X Height)	60.00	SMT		0.00	
A16	Neeru Plaster					
	Providing 20mm thick internal smooth cement plaster in cement mortar (1:4) with Neeru finish to concrete / brick surface in all positions including curing, scaffolding, carting away the debris out of site, cleaning the site etc. complete as per instructions of Architect / Engineer.					

	Mode Of Measurement - Length X Height	50.00	SMT		0.00	
A17	Gypsum Finish Plaster					
	Do as above Item No. A06, but plaster shall have 12 -15 mm thk. gypsum finish etc. complete as per instructions of Architect / Engineer.					
	Mode Of Measurement - Length X Height	65.00	SMT		0.00	
	TOTAL OF SECTION 'A'				0.00	
(B) PLUMBING WORK						
B01	Europeon WC (Wall Mounted)					
	Supplying & Fixing Jaquar make light color glazed European W.C. of wall mounted type fixed with M.S.Brackets fixed with Nut Bolt or as per Manufacturer specification including Seat Cover, Heavy Quality C.P. Hinges, fixing the closet on to wall with suitable teak wood Plugs, Sheet Metal screws, Cutting Masonry OR concrete surfaces, restoring damaged portions with Cement Mortar (1:4) mixed with polymer & 6mm thick size stone metal, scaffolding, carting away the debris of compound, cleaning etc. complete as per instructions of the Architect / Engineer. and as per following fixtures: -					
	Model - JAQUAR Make - ARS-WHT-39951UFSM-ARIA					
	Flush plate: JCP-CHR-102415					
	Mode Of Measurement - Per Numbers	3.00	No.s		0.00	
B02	Urinal					
	Model - JAQUAR Make - URS-WHT-13253N					

	Providing & Fixing Jaquar make urinal in light color, auto flushing fixed to wall including all mountings, waste coupling, bottle trap, C.P. connector, cutting and making good wall / floors, sealing of joints, testing etc. complete as per instructions of the Architect /Engineer.					
	Mode Of Measurement - Per Numbers	3.00	No.s		0.00	
B03	Concealed Flushing Cistern					
	Providing & Fixing Jaquar make light color concealed cistern 3/6 Liters flushing along with adjustable flush with flush plate (Crome Mat)fixed as per site manufacturer specification & requirements with necessary fittings including making necessary opening in walls, Cutting Masonry or concrete surfaces, restoring damaged portions with Cement Mortar (1:4) mixed with polymer and 6mm thick size stone metal, carting away debris out of compound, cleaning etc. complete as per instructions of Architect/Engineer.					
	Model - JAQUAR-JCS-WHT-2400FS					
	Mode Of Measurement - Per Numbers	3.00	No.s		0.00	
B04	Wash Basin(Over the counter)					
	Providing and Fixing JAQUAR make light color glazed Rectangular shape wash basin above counter including fixing wash basin above counter the counter slab with Cast Iron Brackets along with suitable T.Wood Plugs, Sheet Metal Screws, Cutting Masonry or concrete surfaces, restoring damaged portions with C.M. (1:4) mixed with polymer & 6mm thick size stone metal, carting away debris out of compound, cleaning etc. complete as per the instructions of Architect/ Engineer & as per following fixtures: -					
	JAQUAR Make - ARS-WHT-39901 ARIA OR OPS-WHT-15905					
	CP Brass waste coupling - JAQUAR Make					
	10mm, 1'-6" Long C.P. Copper Connector Pipe - JAQUAR Make					

	CP Bottle Trap (JAQUAR - ALD-WHM-769L300X190-ALLIED)					
	35mm CP Brass Connector For Outlet					
	Mode Of Measurement - Per Numbers	5.00	No.s		0.00	
B05	Angular Stop Cock (VGP-CHR-81053-Vingette Prime)					
	Providing & Fixing in position heavy duty concealed angular stop cock with wall flange including non-return valve, sealing of joints, taflon taping, testing etc. complete as per instructions of the Architect / Engineer.					
	Mode Of Measurement - Per Numbers	10.00	No.s		0.00	
B06	Stop Cock (JAQUAR - VGP-CHR-81083K Vingette Prime)					
	Providing & Fixing in position extra heavy duty concealed stop cock with wall flange including of non return valve, sealing of joints, taflon taping, testing etc. complete as per instructions of Architect / Engineer.					
	Mode Of Measurement - Per Numbers	5.00	No.s		0.00	
B07	Bib Cock (JAQUAR - CON-CHR-047KN)					
	Providing & Fixing in position bib cock with wall flange in toilet with sealing of joints with taflon taping, testing etc. complete as per instructions of the Architect / Engineer.					
	Mode Of Measurement - Per Numbers	3.00	No.s		0.00	
B08	Long body Pillar cock (JAQUAR - OPP-CHR-15021PM)					

	Providing & Fixing in position Long body pillar cock on counter as per site location with sealing of joints with taflon taping, testing etc. complete as per instructions of the Architect /Engineer.					
	Mode Of Measurement - Per Numbers	5.00	No.s		0.00	
B09	Two Way Bib Cock with Jet Spray					
	Providing & Fixing in position bib cock with wall flange in					
	toilet with sealing of joints with taflon taping, testing etc.					
	complete as per instructions of the Architect / Engineer.					
	(Model -health faucet - ALD-CHR-577)					
	Mode Of Measurement - Per Numbers	3.00	No.s		0.00	
B10	Toilet Paper Holder (ACN-CHR-1151N)					
	Providing & Fixing in position Toilet Paper Holder in Chromium Plated finish.					
	Mode Of Measurement - Per Numbers	3.00	No.s		0.00	
B11	HAND DRYER (JAQUAR- HDR-SSF-AK2803D)					
	Providing and fixing Hand Dryer of JAQUAR make as					
	per the site location & instructions of Architect / Engineer					
	(Mode Of Measurement - Per Numbers)	3.00	No.s		0.00	
B12	TISSUE DISPENSER (JAQUAR - PTD-SAP-DT0106CSN)					
	Providing & Supplying stainless steel wall mounted tissue					
	(paper towel) dispenser with necessary fittings & fixtures etc.					

	complete as per site requirements & instructions of Architect/Engineer.					
	(Mode Of Measurement - Per Numbers)	3.00	No.s		0.00	
B13	Floor Nahani Trap					
	Providing & Fixing of approved make cast iron nahani trap					
	with Single or Multiple inlets varying from 40mm dia outlets					
	upto 110mm dia with water seal, Embedding trap in cement					
	concrete for thickness of 3" alround providing Chrome plated					
	gratting along with cast iron floor trap etc. complete as per site requirement and instructions of the Architect/Engineer.					
	(Mode Of Measurement - Per Number)	7.00	No.s		0.00	
B14	Towel Rail (JAQUAR - CPA-CHR-1111)					
	Providing & Fixing in position chrome plated towel rail of 600 mm long as per site requirements & instructions of Architect /Engineer.					
	Mode Of Measurement - Per Number	3.00	No.s		0.00	
B15	Towel Ring (JAUAR - CPA-CHR-1121)					
	Providing & Fixing in position chrome plated towel rail of 24" long as per site requirements & instructions of Architect /Engineer..					
	Mode Of Measurement - Per Number	2.00	No.s		0.00	
B16	Soap Dispenser (JAQUAR - SDR-WHT-DJ0010FN)					

	Providing & Fixing stainless steel soap dispenser of approved make/design as fixed as per site requirements & instructions of Architect/Engineer.					
	Mode Of Measurement - Per Numbers	5.00	No.s		0.00	
B17	Double Coat Hook					
	Providing & Fixing in position double coat hook in toilet as per site location etc. complete as per instructions of the Architect/ Engineer .					
	Mode Of Measurement - Per Numbers	5.00	No.s		0.00	
B18	UPVC Concealed Pipe					
	Replacing all internal UPVC pipelines with Finolex or Equivalent make of following sizes of required Standard Thickness confirming to IS - 4985 including necessary fittings i.e. Bends, Tees, Reducers, Elbows, Enlargers, Plug with M.S. Clamp, chiesel the walls for concealing pipes and necessary drilling for making holes in Walls, Slabs etc., restore the same in original condition neatly including necessary scaffolding removing existing pipes and carting away debris out of the compound etc. complete as per site requirement and instruction of the Architect .					
	Mode Of Measurement - Length In Running Feet					
	15 mm dia	100.00	RMT		0.00	
	20mm dia	90.00	RMT		0.00	
	25 mm dia	75.00	RMT		0.00	
	40 mm dia	65.00	RMT		0.00	
B19	40 mm dia CPVC Pipe for Waster Water Line					

	Do as above ITEM No.B18 But providing fixing CPVC pipe for waste water of 40mm dia. and restore the same in original condition neatly including necessary scaffolding removing existing pipes and carting away debris out of compound etc. complete as per site requirement and instrcution of Architect .					
	Mode Of Measurement - In Running Feet	55.00	RMT		0.00	
B20	75 mm dia CPVC Pipe for Waster Water Line					
	Do as above ITEM No. B18 But providing fixing CPVC pipe for waste water of mm dia. and restore the same in original condition neatly including necessary scaffolding removing existing pipes and carting away debris out of compound etc. complete as per site requirement and instrcution of Architect .					
	Mode Of Measurement - In Running Feet	45.00	RMT		0.00	
	TOTAL OF SECTION 'B'				0.00	
	GRAND TOTAL (A + B)				**0.00**	
	GST WILL BE EXTRA AS APPLICABLE					

S.No.	Description of items	Qty	Unit	Rate	Amount	Amount (Rs) in words
(A)	FURNITURE WORK					
A01	CRM Table with side table (Veneer Finish & Lamination for Table & Side Table top)					
	Table Size: - 7'-0" X 3'-0" X 2'-6" Side Table Size: -5'-6" X 1'-6" X 2'-3"					

	Providing & Fixing Chief Manager table with side table made out of 19mm thick BWR ply frame work for table and side table Tops, sides, apron, shelves, drawer units, shutters, drawers front, stiffners, borders, 12mm thick BWR ply for drawer sides, keyboard, borders, foot rest and 6mm thk. BWR ply for drawer unit back, drawer bottom, side unit back, grooves etc.teak wood with edge bedding along with 75mm X 65mm, 40mm X 40mm TEAK WOOD MOULDINGS of veneer matching color.					
	The table shall have one drawer unit with one tea tray, one pencil tray					
	& 3 Nos. of equal drawers below. The side table shall have drawers at					
	top & sliding shutters below along with provision for C.P.U. hanger.					
	The table shall have 750mm in height and side table shall have 675mm					
	in height finished with 3mm thk. Veneer of approved make / color.					
	The front apron shall have 19mm thick BWR ply along with 3mm thick					
	approved make/color veneer etc. complete.					
	All the exposed surfaces of the table, side table, drawer units shall have approved make/color 3mm thk veneer finish with Melamine polish with 10 mm thk. plain glass for top and shall have approved make/color 0.80mm thick laminate to all INSIDE surfaces including HETTICH / BLUM / KICH make Heavy Type Telescopic Drawer Sliding Channel, Drawer Locks With One Master Key, CPU Hangers, make Brush Finish Stainless Steel Hinges, Stainless Steel Handles, Stainless Steel Brass Wire Manager, Rubber Matting for foot rest including making holes in glass top for wire manager etc. complete as per the detail drawing & instructions of the Architect.					
	(Basic Cost Of Veneer Rs. 1200/- Per SMT with Single Matching Group)					
	Mode Of Measurement – Per Number	1.00	No.s		0.00	

A02	Regional Manager Table with side table (Veneer Finish & Lamination for Table & Side Table top)					
	Table Size: - 6'-0" X 3'-0" X 2'-6" Side Table Size: -4'-6" X 1'-6" X 2'-3"					
	Do as above item no. 'A01' but table shall made of above mentioned size, table shall be made as per detail drawing & instruction of Architect/ NIACL Engineer.					
	Mode Of Measurement – Per Number	1.00	No.s		0.00	
A03	RM's Table with side table (Laminate Finish)					
	Table Size - 5'-0" X 2'-6" X 2'-6" Side Table - 4'-6" X 1'-6" X 2'-3"					
	Do as above item no. 'A01' but table shall made of above mentioned size and design as per detail drawing. All exposed surface of table shall finish with 1.00 mm thk. Appd. Color laminate including laminate matching color PVC edge bidding etc complete as per detail drawing & instruction of Architect/ NIACL Engineer.					
	Mode Of Measurement – Per Number	8.00	No.s		0.00	
A04	Underwriter's Table without side table & appron (Laminate Finish)					
	Do as above Item NO. A03 but, table shall be in size of 4'-6' in legth instead of 5'-0" etc complete as per detail drawing & instruction of Architect/ NIACL Engineer.					
	Mode Of Measurement – Per Number	8.00	No.s		0.00	
A05	Table with side table without appron for Claims Staff (Laminate Finish)					
	Do as above Item NO. A03 but, table shall be without front appron or modesty panel etc complete as per detail drawing & instruction of Architect/ NIACL Engineer.					

	Mode Of Measurement – Per Number	13.00	No.s		0.00	
A06	Reception Table (Corian Finish)					
	Table Size - 4'-0" X 2'-0" X 3'-6"					
	Providing & Fixing Reception table made out of 19mm thick BWR ply frame					
	work for table top, sides, apron, shelves, drawer units, shutters, drawers front,					
	stiffners, borders, 12mm thick BWR ply for drawer sides, keyboard, borders, foot					
	rest & 6mm thick BWR ply for drawer unit back, drawer bottom, grooves etc.					
	teak wood with edge bedding.					
	The table shall have two drawer units with one tea tray, one pencil tray					
	& 3 Nos. of equal drawers below along with provision for C.P.U. hanger.					
	Table top shall have 6 mm thk. Acrylic solid surface (Corian) on Table Top & Edges.					
	customer top shall have 975mm with Saint Gobain / Asahi India make 10mm thick					
	FROSTED GLASS with Edge Moulding and front apron shall have Teak wood patti finish with matching color polish.					
	All exposed surfaces of the table drawer units shall have approved make / color 1mm thk. laminate in two or three shades and all INSIDE surfaces shall have 0.8 mm thk. laminate of apprd make including necessary hardwares i.e. HETTICH /BLUM / KICH make Heavy Type Telescopic Drawer Sliding Channel, Drawer Auto Locks With One Master Key, C.P.U. Hangers, KICH make Brush Finish Stainless Steel Hinges, S. Steel Handles, stainless steel brass wire manager, rubber matting for foot rest including making holes in glass top for wire manager. etc. complete as per the detail drawing & instructions of the Architect/PMC.					
	Mode Of Measurement – Per Number	1.00	No.s		0.00	

A07	Conference Table (Corian & Veneer finish)					
	Table Size - 10'-0" X 4'-0" X 2'-6"					
	Providing & Fixing Meeting table made out of 2" X 1 1/2" imported teak					
	wood frame work at 1'-6" c/c bothways for table top cover with 9mm thick					
	BWR ply from bottom and 19mm thick BWR ply from top.					
	Table top along with edges shall have 6 mm thk. acrylic solid surface (corian).					
	The Meeting table stand made out of 2" X 1 1/2" C.P.T.Wood frame work					
	1'-6" c/c bothways covered with 6mm thick flexible plywood in 3 layers					
	finish with 4 mm thick veneer in two shades including 3/4" X 3/4" moulding					
	of matching color of veneer and foot rest shall have 19mm thick BWR					
	ply slopping design with 4 mm thick veneer finish with 3 coats of melamine					
	polish.					
	all exposed surfaces shall have approved make / color 4 mm thk. Veneer					
	in 2 shades finish with 1.5mm thick to 2mm thick lamination for top					
	& 1.00 mm thick PU coating to vertical surface including Stainless Steel					
	Cable Tray 2'-0" X 6" X 6" deep made out of 2mm thick Brush Finish Stainless					
	Steel Tray with Auto Hinges Flap for electrical switches including					
	necessary openings for wire manager, mikes etc. complete as per detail					
	drawing & instructions of the Architect/PMC.					
	(Basic Cost Of Veneer Rs. 1350/- Per SMT)					
	Mode Of Measurement - Per Number	1.00	No.s		0.00	

	TOTAL OF SECTION 'A'				0.00	
(B)	STORAGE					
B01	Full Height Storage (Laminate Finish)					
	Providing & Fixing full height storage 450mm deep made out of 25mm thick BWR ply frame work for sides, bottom, shelves, top, shutters, 6mm thick BWR ply for backside of storage along with teak wood edge bedding, 40mm X 25mm laminate matching color edge moulding & stainless steel pin for adjustable shelves fixing etc. complete.					
	All exposed surfaces shall have approved make/color 1.0mm thick laminate including edges, grooves and 0.8mm thick white colour laminate to all internal surfaces.					
	along with necessary approved make/design hardware i.e. Blum/ Haffle / hettich / Kich Stainless Steel Hinges ,Stainless Steel Brush Finished Handles, 150mm Stainless Steel Tower bolts at top and Bottom Magnetic Ball Catches, Apporved make locks etc. complete as per detaildrawing and instructions of Architect /Bank's Engineer.					
	Mode Of Measurement - Length X Height	35.00	SMT		0.00	
B02	Low Height Storage (Laminate Finish)					
	Providing & Fixing low height storage 450mm deep made out of 19mm thick BWR ply frame work for sides, bottom, shelves, top, shutters, 6mm thick BWR ply for backside of storage along with teak wood edge beading					

	All exposed surfaces shall have approved make/color 1.0mm thick laminate including edges, grooves & 0.8 mm thick white color laminate to internal surfaces along with necessary approved make hardware i.e. Blum / Haffle / hettich / Kich Stainless Steel Hinges , Stainless Steel Brush Finished Handles,150mm Stainless Steel Tower Bolts at top & bottom, Magnetic Ball Catches, Locks, carting away debris out of compound, cleaning the site etc. complete as per site requirements, detail drawing and instructions of the Architect / Bank's Engineer.					
	Mode Of Measurement - Length X Height	30.00	SMT		0.00	
B03	Low Height Storage Veneer Finish					
	Do as above ITEM NO. B01 (LOW HEIGHT STORAGE - LAMINATE FINISH),					
	but external surfaces shall have approved make/colour 4 mm thick					
	veneer fixed with horizontal or vertical pattern including grooves					
	finish the all surfaces including top with MELAMINE polish along					
	with 1.00mm to 1.5mm thick LAMINATION on top etc. complete as per					
	the site requirements, detail drawing & instructions of the Architect /Engineer.					
	(Basic Rate of Veneer : Rs. 1200/- Per SMT)					
	Mode Of Measurement - Length X Height	5.00	SMT		0.00	
B04	Storage for Electrical Panel					
	Providing and Fixing shutters for electrical panel made out of 50mm X 40mm C.P.T.Wood frame work for sides and shutters made out of 19mm thick BWR ply with edge beading.					

	All exposes surfaces shall have approved make/color 1.0mm thick laminate and 0.8mm thk. approved color laminate from inside along with 150mm wide Aluminum powder coating A.C.grill at top and bottom for exhaust including approved make/design hardware i.e. S. S. Hinges with S.Steel Bearing (AISI 316 Grade) & Stainless Steel Pin (AISI 316 Grade), Stainless Steel Brush Finish Handles, 150mm Stainless Steel Tower Bolts at top and bottom, Magnetic Ball Catches,Locks, etc. complete as per site requirements, detail drawings and instructions of the Architect / NIACL Engineer.					
	Mode Of Measurement - Length X Height	3.50	SMT		0.00	
	TOTAL OF SECTION 'B'				0.00	
{C}	PARTITION					
	FULL HEIGHT PARTITION					
C01	Both Side Laminate Finish					
	Providing and Erecting in position approximate 9'-0" to 10'-0" in height partitions to be made out of 2" X 2" X 1.5mm thick Aluminum Tubular section frame work 2'-0" c/c bothways (Vertical & Horizontal) fixed with 2" X 2" X 2.5mm thick Aluminum Angle Cleats with Pan Headed Screws covered with 9 mm thk. BWR Ply (ISI 303 Grade) from both sides fixed with Flat Headed Metal Screws. The aluminum members of partition shall rigidly fixed to the existing Ceiling / Floors / Beams & Side Walls, whichever is applicable & as directed, the alternate members and corner members fixed upto existing Slab, Beams, whichever applicable.					
	All exposed surfaces of the partition shall have approved make / color 1.0 mm thick laminate from both sides or as per site requirements etc. complete. The necessary openings in the partitions shall be provided for A.C. Grill, Electrical Conduits, Electrical Switches, Light Fixtures, A.C. Opening, etc. complete as per detail drawing & instructions of Architect/ Bank's Engineer.					

	Note: Rate shall be inclusive of providing & fixing of 2" thk. glasswool upto slab / beam level in the partition framework before fixing of ply from both the sides.					
	Note :- Height of the partitions upto sofit of false ceiling shall be considered for payment.					
	Mode Of Measurement - Length X Height	22.00	SMT		0.00	
C02	One Side Laminte One Side Veneer finish partition with 12 mm thk. toughened glass to be fixed on S.S.Runner					
	Do as above item no. A01 but partition shall have one side 9 mm thk. BWR ply covered with 4 mm thk. appd. Veneer in required design to be finished with melamine polish. Veneer grooves shall be finished with inlay patti in rosegold finish. Other side of partition shall have approved color/ make 1 mm thk. laminate in given design etc. complete as per site requirements detail drawing & instructions of Architect / Engineer.					
	Note: Rate shall be inclusive of providing & fixing of 2" thk. glasswool upto slab / beam level in the partition framework before fixing of ply from both the sides.					
	(Basic Rate of Veneer : Rs. 1250/- Per SMT)					
	Mode Of Measurement - Length X Height	12.00	SMT		0.00	
C03	Both Side Veneer finish fully glazed 12 mm thk toughened glass partition					

	Do as above ITEM NO. A01. but partition shall have12 mm thk. TOUGHENED float glass for full height partition in single piece or 2 or 3 pieces (minimum 2400mm in length) with computerised diamond cut & diamond edge polish. The TOUGHEN Glass fixed with Brush finished Stainless Steel Runner for top, bottom, sides or as per site requirements including making required cutouts/ holes for Locks, Handles, "V" cut grooves to be filled with 'T' Section in S.S.finish from both the ends etc. along with Sunk Headed Metal Screws, adhesive, nails. other exposed surfaces of partition shall be finished with 4 mm thk. veneer from both sides with melamine polish etc. complete as per site requirements detail drawing & instructions of Architect / Engineer.					
	Note: Rate shall be inclusive of providing & fixing of 2" thk. glasswool upto slab / beam level in the partition framework before fixing of ply from both the sides.					
	(Basic Rate of Veneer : Rs. 1250/- Per SMT)					
	Mode Of Measurement - Length X Height	11.00	SMT		0.00	
C04	Both Side Veneer Finish Partition					
	Do as above item no. A01but, but partition shall have 9 mm thk. BWR ply from both sides covered with 4 mm thk. appd. Veneer in required design to be finished with melamine polish. Veneer grooves shall be finished with inlay patti in rosegold finish. etc. complete as per the site requirements, detail drawing and instructions of Architect / Engineer. partition shall have 6 mm thk. Inlay patti (Rosegold finish).					
	Note: Rate shall be inclusive of providing & fixing of 2" thk. glasswool upto slab / beam level in the partition framework before fixing of ply from both the sides.					
	(Basic Rate of Veneer : Rs. 1200/- Per SMT)					
	Mode Of Measurement - Length X Height	22.00	SMT		0.00	

C05	12 mm thk. toughened glass partition to be fixed on S.S.Runner					
	Do as above ITEM NO. B01. but partition shall have12 mm thk. TOUGHENED (double soundproof) float glass for full height partition in single piece or 1 or 2 pieces (minimum 2400mm in length) with computerised diamond cut & diamond edge polish. The TOUGHEN Glass fixed with Brush finished Stainless Steel Runner for top, bottom, sides or as per site requirements including making required cutouts/ holes for Locks, Handles, "V" cut grooves to be filled with 'T' Section in S.S.finish from both the ends etc. along with Sunk Headed Metal Screws, adhesive, nails etc. complete as per site requirements detail drawing & instructions of Architect / Engineer.					
	Mode Of Measurement - Length X Height	34.00	SMT		0.00	
C06	Low Height Partition / Both Side Laminate partly glazed 10 mm thk. Plain glass					
	Do as above ITEM NO.A01 (Both Side Laminate), but low height partition shall have 4'-6" in height . aluminiumn framework (Upto 3') shall be at 1'-6" C'C covered with 9 mm thk. BWR ply finish with 1 mm thk. appd color laminate. 10 mm thk. Plain glass to be fixed above 3'-0" in height or as per detail drawing. Glass to be fixed S.S. Finish approved bracket etc. complete as per the site requirements, detail drawing and instructions of Architect / Engineer.					
	Mode Of Measurement - Length X Height	110.00	SMT		0.00	
	TOTAL OF SECTION 'C'				0.00	
(D)	Doors					

D01	Fully Glazed 12 mm thk. toughened glass Door with door frame					
	Providing and Fixing Main doors made of Sait Gobain / Asahi India make 12mm thk. edge toughened glass in single piece with computerised diamond cut and diamond polish for Main doors including making required cutouts, holes for locks, handles, pivot, patch fittings, corner fittings, hinges etc. The rate is inclusive of supply and fixing of Blumor equivalent make floor spring, Pivot (Top & Bottom) patch fitting with cover plate, Locks, Signages with necessary hardware etc. complete as per site requirement and instructions of the Architect/ Engineer.					
	Mode Of Measurement - Length X Height	11.00	SMT		0.00	
D02	Both side laminate door with door frame					
	Providing & Fixing solid core flush door with door frame made out of 100 mm X 63 mm IMPORTED teak wood frame work in required shape and shutters made out of 32mm thick approved make Solid Core BWR Flush Door along with approved make/color 1.00 mm thick appd. Color/ design laminate from both side , 6mm thick imported teak wood edge beading. The edge of the Doors / Shutters frame at edge finish with melamine polish of laminate matching shade along with approved make / design hardware i.e. Door Closure,S.S. Hinges, Stainless Steel Handles, Locks, Signage's, Name Plate with necesasry hardware i.e. Sheet Metal Screws, Nails, Fevicol etc. complete as per instructions of the Architect Engineer.					
	Mode Of Measurement - Length X Height	16.00	SMT		0.00	
D03	Trap door for rolling shutter & AC duct					
	Providing & Fixing trap door for AC & Rolling shutter units made out of					
	50mm X 50mm II Class C.P.T.Wood frame work covered with 9mm thick					

	BWR (IS 303) / IS 710 BWP Ecotech or Equivalent ply from one side for shutters & 50mm X 75mm II class C.P.T.W. outer frame with vertical supports upto RCC slab.					
	All the exposed surfaces shall be finish with approved make					
	1.5 mm thick WHITE color laminate on outer side & 3 coats of					
	enamel paint on internal side including necessary approved					
	make/design S.S. Hinges, Concealed Handle, S.S. Stopper,					
	S.S.Locks etc. complete as per requirements of Air Conditioning Co. & instructions of the Architect.					
	Mode Of Measurement - Length X Height	6.00	SMT		0.00	
D04	Both side veneer finish door					
	Providing & Fixing solid core flush door with door frame made out of 100 mm X 63 mm IMPORTED teak wood frame work in required shape and shutters made out of 32mm thick approved make Solid Core BWR Flush Door along with approved make/color 3.00 mm thick appd. Color/ design veneer with melanine polish from both side , 6mm thick imported teak wood edge beading. The edge of the Doors / Shutters frame at edge finish with melamine polish of laminate matching shade along with approved make / design hardware i.e. Dorma / Haffle / Hettich / Kich Door Closure,S.S. Hinges, Stainless Steel Handles, Locks, Signage's, Name Plate with necesasry hardware i.e. Sheet Metal Screws, Nails, Fevicol etc. complete as per instructions of the Architect Engineer.					
	Mode Of Measurement - Length X Height	5.00	SMT		0.00	

	TOTAL OF SECTION 'D'				0.00	
(E)	PANELLING / WALL CLADDING					
E01	Laminate Finish Panelling					
	Providing and Fixing laminate finish paneling for walls, columns etc. made out of 2"X 1" X 1.5 mm thick Aluminum Tubular frame work at every 1'-6" c/c (Vertical /Horizontal) both ways, covered with 6 mm thk. BWR ply.upto ceiling height etc. complete.					
	All the exposed surfaces of the paneling shall be finish with approved make/color 1.00mm thk. solid core laminate upto ceiling height along with groove at junction of laminate etc. complete as per site requirements, detail drawing and the instructions of the Architect/Engineer.					
	Mode Of Measurement - Length X Height	28.0	SMT		0.00	
E02	Veneer Finish Panellling					
	Providing and Fixing laminate finish paneling for walls, columns etc. made out of 2"X 1" X 1.5 mm thick Aluminum Tubular frame work at every 1'-6" c/c (Vertical /Horizontal) both ways, covered with 6 mm thk. BWR ply.upto ceiling height etc. complete.					
	All the exposed surfaces of the paneling shall be finish with approved make/color 3.00mm thk. appd. Veneer with melamine polish upto ceiling height along with groove at junction of laminate etc. complete as per site requirements, detail drawing and the instructions of the Architect/Engineer.					
	(Basic Cost Of Veneer Rs. 1250/- Per SMT)					
	Mode Of Measurement - Length X Height	20.00	SMT		0.00	
E03	MDF (Fluted Panel) Panelling					

	Providing & Fixing MDF fluted panel sheet of 12 mm thk. (interior grade) including making of cutout of approved design and fix the grill on veneer / laminate/ glass panelling finished with duco paint (matt finish) of appd. make/ color and fix with necessary hardware & fittings etc. complete as per site requirements, detail drawing and the instructions of the Architect/Engineer.					
	Mode Of Measurement - Length X Height	35.00	SMT		0.00	
E04	ACP Panelling (Exterior)					
	Providing and Fixing 3 mm thk.A.C.P. finish paneling for walls, columns etc. made of 50 mm X 25 mm X 1.5mm thick Aluminum Tubular frame work at every 450 mm c/c (Vertical/Horizontal) both ways upto ceiling height.					
	All the exposed surfaces of the paneling shall be finish with approved make/color 3.0mm thick A.C.P. finished with upto ceiling height along with 6mm wide groove etc. complete as per site requirements, detail drawing and the instructions of the Architect/Engineer.					
	Mode Of Measurement - Length X Height	38.00	SMT		0.00	
E05	8 mm thk. Acoustic Board fixing on partition					
	Providing & Fixing acoustic panel made up of 12 mm thick Acoustic panel					
	in required shape / Design. Fixed the panel on the existing plywood of partition /					
	panelling with adhesive or fixed as per the manufacturer's					
	specifications etc. complete as per the site requirement and instructions					
	of Architect / Engineer.					
	Mode Of Measurement - Length X Height	31.00	SMT		0.00	
E06	8 mm thk. Calcium board panelling					

	Providing and Fixing laminate finish paneling for walls, columns etc. made out of 2"X 1" X 1.2mm thick Aluminum Tubular frame work at every 1'-6" c/c (Vertical /Horizontal) both ways, covered with 8 mm thk. calcium silicate board upto ceiling height with Sunk Headed Metal Screws as per the site requirements in required shape.					
	All the exposed surfaces of the paneling shall be finish with approved make/color two hours fire rated paint in two coats etc. complete as per site requirements, detail drawing and the instructions of the Architect/Engineer.					
	Mode Of Measurement - Length X Height	15.00	SMT		0.00	
	TOTAL OF SECTION 'E'				0.00	
(F)	Chairs / Sofa					
F01	High Back Chair					
	P/& Supplying HIgh Back Cushion Chairs of below given make / model no.					
	Model: Godrej - Versa Neo					
	Featherlite: HF 366 HB (LEATHERETTE)					
	Mode Of Measurement - Per Number	3.00	No.s		0.00	
F02	Medium Back Chair					
	P/& Supplying Medium Back Cushion Chairs of below given make / model no.					
	Model: Godrej - Versa Neo					
	Model: Featherlite - Aplha Cushion MB / Opus					
	Mode Of Measurement - Per Number	56.00	No.s		0.00	
F03	Low Back Chair					
	P/& Supplying Low Back Cushion Chairs of below given make / model no.					

	Model: Godrej - Versa Neo					
	Model: Featherlite - Aplha Cushion MB / Opus					
	Mode Of Measurement - Per Number	16.00	No.s		0.00	
F04	Sofa (Composite Leather Sofa)					
	Provide sofa made of 3" X 1 1/2" & 4" X 1 1/2" C.P.T.Wood frame work along with 6mm thick marine ply for arms on either side in flexible ply of two layers The sofa shall have 9" height vertical type spring shall be fixed with thk nylon thread for the seat along with 4" thick MM foam for seat, 3" thick MM foam for back, 2" thick MM foam for handles with covering mix pieces of foam should be spread over the individual seat to have comfort along with 1" thick layer of foam for back & seats, white kantan, approved make Composite Leather shall be used in wrinkle type design as a finishing material etc. complete as per detail drawing or as per approved sofa pattern, instructions of the Architect.					
	(Basic price of composite leather : Rs. 600/- per mtr.)					
	Mode Of Measurement - Per Number	6.00	RMT		0.00	
F05	Side Table (Veneer Finish)					
	Providing & supplying side table made of 19 mm thk. BWR ply					
	framework along with 12 mm thk. BWR ply finished with 3 mm thk. approved					
	color veneer top and edges, base and all exposed surfaces along with 10 mm thk. glass on top etc. complete as per detail drawing and instructions of Architect / Engineer.					
	Mode Of Measurement – Per Number	2.00	No.s		0.00	
F06	Side Table (Laminate Finish)					

	Do as above item no. F05 but, all exposed surface shall have 1 mm thk. appd color laminate in two shades with necessary hardwares & adhesive etc. complete as per detail drawing and instructions of Architect / Engineer.					
	Mode Of Measurement – Per Number	1.00	No.s		0.00	
	TOTAL OF SECTION 'F'				0.00	
(G)	FLOORING WORK					
G01	Marble Flooring					
	Providing and fixing 18 / 20 mm thk. marble flooring on floor as per existing size of existing macthcing color white makrana marble as per site required size in the instead damaged floor / above new raceway. The 18/ 20 mm Thick marble floor laid on bed of 2" to 3" thick cement mortar (1 : 4), 4mm to 5mm thick float of cement slurry ,filling the joints with matching joints with matching cement slurry , polishing , cleaning , carting away debris out of compound etc. complete as per detail drawing and instrucitons of Architect / Engineer.					
	(Basic Rate Rs.3250/- per SMT)	110.00	SMT		0.00	
G02	Engineer Wooden Flooring					
	Providing & Fixing approved make 18mm thick Engg. Wooden flooring					
	of NILOTIKA,TEAK or Equivalent panels of approved colour. Of					
	1380mm X 195mm X 18mm thickness (hardwood base) imported tiles					
	of the teak veneer OR approved shade along with the 6mm thk. PVC					
	underlay shall be laid on existing floor as per manufacurer's Specification					

	etc.,complete as per site requirements and instructions of the Architect.					
	(Basic Rate Rs. 2850/- per SMT)					
	Mode Of Measurement - Length X Width	21.00	SMT		0.00	
G04	Tin oxide polish to existing marble (Machine polish)					
	Providing machine tinoxide polish to the existing & new marble flooring,					
	staircase midlanding, treads & risers in two coats & carting away debries out					
	of the site etc. complete as per instructions of Architect / engineer.					
	Mode Of Measurement - Length X Width	172.00	SMT		0.00	
	TOTAL OF SECTION 'G'				0.00	
(H)	FALSE CEILING					
H01	Gypsum Ceiling					
	P/Fixing Gypsum Board false ceiling of Gypsum India or equivalent make. METALLIC GRID (conforming to IS:2095:1982): - The metallic grid shall consists of GI Perimeter channels of size 27mm X 0.5mm thick having one flange of 20mm & another flange of 30mm, GI Intermediate channel of size 45mm X 0.9mm thick with two flange of 15mm each at 1200mm center to center, GI hanger of size 25mm X 10mm X 0.5mm thick at 1200mm center to center distance along with GI Cleat & Steel Expansion Fasteners.					

	The Ceiling section of 0.5mm thickness having curled wedge of 51.5mm and two flanges of 26mm each with lips of 10.5mm at 450mm c/c. along with connecting clips of 12.5mm drive fixed with sheet metal screws at 230mm c/c. METAL GRID INSTALLATION: - Perimeter channel fixed to all side of walls, partitions, beams, columns, whichever applicable fixed with sheet metal screws with rawalplugs at 225mm center to center & intermediate channels at 1200mm center to center including GI steel hangers fixed to the slab, beams soffit, whichever with GI cleats & steel expansion fastners.soffit, whichever with GI cleats & steel expansion fastners.					
	The ceiling section placed in a direction perpendicular to the intermediate channel at 450mm c/c. fixed to the intermediate channel with the help of connecting clips & 12.5mm dry wall Sheet Metal Screws at 230mm c/c. Distance.					
	COVERING: - Fixed 12.5mm thick gypsum board to the metal frames in required shape in taper / square edges of the gypsum board shall be finish with filling the joints with fibre tape finish the surfaces in one level & line finish with three coats of approved make / shade Plastic Emulsion paint including making grooves, cutouts for Light Fittings, AC Grills, AC Diffusers, Smoke Detectors, Sprinklers System, Security System etc. as per the other vendors requirements along with additional frame for Light Fittings & AC Grills, scaffolding etc. complete as per instructions of Architect. OR do as per Manufacturer's Specification.Cutouts will not be deducted while measuring the ceiling area.					
	Mode Of Measurement - Length X Width	180.00	SMT		0.00	
H02	9" High Band for Side Verticle (Gypsum)					
	Providing & fixing gypsum for verticle drop ceiling (1'-0" high) for the provision of cove light including appd. color paint etc. complete as per instruction of Architect / Engineer. Note: Measurement for the said item will be considered in Running Feet.					

	fix the glasswool in ceiling and cover the same with foil with necessary adhesive, fittings and fixture etc. complete as instructions of the Architect / Engineer.					
	Mode Of Measurement -Running Feet	140.00	RMT		0.00	
H03	4" High Band for Side Verticle (Gypsum)					
	Providing & fixing gypsum for verticle drop ceiling (6" high) for the provision of cove light including appd. color paint etc. complete as per instruction of Architect / Engineer. Note: Measurement for the said item will be considered in Running Feet.					
	fix the glasswool in ceiling and cover the same with foil with necessary adhesive, fittings and fixture etc. complete as instructions of the Architect / Engineer.					
	Mode Of Measurement -Running Feet	165.00	RMT		0.00	
H04	Veneer False Ceiling					
	Providing & fixing veneer false ceiling made out of 2" X 2" C.P.T.Wood					
	frame work, 1'-6" c/c cover with 12mm thk BWR at one side finish					
	with 3 mm thick approved colour VENEER & 12mm wide INLAY work & 1" X 1", 2" X 1" C.P.T.Wood moulding & 2" X 2" C.P.T.W. Suspension, scaffolding.					
	All exposed surface finished with approved colour melamine polish in two tone colours etc. complete as per detail drawing & instructions of the Architect/Engineer.					
	(Basic Cost Of Veneer Rs. 1200/- Per SMT)					
	Mode Of Measurement - Length X Height	13.00	SMT		0.00	
H05	Modular False Ceiling					

	Providing & Fixing mineral fibre board false ceiling of AMF / ARMSTRONG or equivalent false ceiling system (THERMATEX FEINSTRATOS MICRO PERFORATED with FINELINE of 15mm GRID with Black GRID REVEAL) of grid size 600mm X 600mm with G.I. ceiling frame work as per Manufacturer's specifications including filling of Acoustic ceiling tiles 15mm thick of size 600mm X 600mm microlook having 0.55 NRC, 38dB & 95% RH and 90% Light Reflector.					
	Smoke Development - 0% Fire Resistance - 120 Minutes A2-s1, d0 & DIN EN 13501-1 The cost of include the cost of frame work for fixing light fixtures. The light fixtures shall not be fixed directly on to the tiles. Complete in all respects as per detail drawings and instructions of Architect. Cutouts will not be deducted while measuring the ceiling area.					
	Mode Of Measurement - Length X Width	104.00	SMT		0.00	
H06	MDF Ceiling					
	Do as above item No. H04 but provide & fix 12 mm thk. approved design MDF Sheet (flutel or designed) with necessary hardware and finish the same with approved color duco paint etc. complete as instructions of the Architect / Engineer.					
	Mode Of Measurement - Length X Width	25.00	SMT		0.00	
	TOTAL OF SECTION 'H'				0.00	
(I)	SUNDRIES					
I01	Rolling shutter with MS framework (Motorised)					
	providing and fixing perforated rolling shutter made of M.S. sheet with necessary spindle , spring , GI hood , guiding channels fixed firmly to walls,necessary locks , including cutting holes and mending good all damages complete as per direction (opening size to be considered for payment), rolling					

	shutter shall be morised operated.					
	Mode Of Measurement - Length X Width	12.00	SMT		0.00	
I02	Motorised Zebra Blinds					
	Providing and fixing of motorised Zebra Blinds of Approved make / Approved fabric fixed with Aluminium powder coated Head rail along with Stainless Steel drivc Rod OR fixed as per Manufacturer's Specification etc. complete as per site requirement and instructions of Architect.					
	Mode Of Measurement - Length X Height	41.00	SMT		0.00	
I03	Zebra Blinds (Manual)					
	Providing and fixing Zebra Blinds of Approved make / Approved fabric fixed with Aluminium powder coated Head rail along with Stainless Steel drivc Rod OR fixed as per Manufacturer's Specification etc. complete as per site requirement and instructions of Architect.					
	Mode Of Measurement - Length X Width	77.00	SMT		0.00	
I04	3M Glass Film (Abstract Design)					
	Cleaning & wiping glass surface free of any dust or foreign bodles & then fixing plain frosted film of LUNAR or 3M or equivalent make on a GLASS partition of Abstract Design with warranty as per the Manufacturer Specification. Cost inclusive of cutout, design etc. as per pattern in detail drawing or as per instructions of the Architect.					

	Mode Of Measurement - Length X Height	32.00	SMT		0.00	
I05	3M Glass film with Company Logo & Advertisment					
	Cleaning & wiping glass surface free of any dust or foreign bodles & then fixing plain frosted film of LUNAR or 3M or equivalent make on a GLASS partition of Company Logo OR advertisment Design with warrantee as per the Manufacturer Specification. Cost inclusive of cutout, design etc. as per pattern in detail drawing or as per instructions of the Architect.					
	Mode Of Measurement - Length X Height	119.00	SMT		0.00	
I07	PELMET					
	Providing and Fixing pelmet made out of 19mm thick BWP ply frame work with necessary					
	2" X 1 1/2" II Class C.P.T.W. frame work finished with approved make/colour enamel					
	paint from inside and outside, fixed with necessary screws, hardware, carting away					
	debris out of compound, cleaning etc. complete as per detail drawing and					
	instructions of the Architect / Engineer.					
	Mode Of Measurement - Per Running Feet	23.00	RMT		0.00	
I08	PLASTIC EMULSION PAINT					

	Removing the existing color wash/distemper/oil bond distemper / plastic/ luster etc. paint by scrapping, washing and scrubbing. The surface shall then be allowed to dry for atleast 24 hours. It shall be then sand papered to give a smooth & even surface. Holes shall be filled with BIRLA putty made of plaster of paris. Then first coat of primer to be applied. After this necessary leveling shall be done with putty and second primer coat shall be applied. The plastic emulsion paint of approved shade and make shall be applied in minimum 3 coats (finishing paint) including scaffolding,cleaning the floors, fittings, furniture's, ladders, glasses, removing of debris out of the compound etc. complete as per the instructions of the Architect / Engineer.					
	Mode Of Measurement - Length X Height	235.00	SMT		0.00	
I09	ENAMEL PAINT					
	Removing the existing enamel paint on doors, windows, grills etc. paint by scrapping, washing & scrubbing. The surface shall then be allowed to dry for atleast 24 hours. It shall be then sand papered to give a smooth & even surface. Holes shall be filled with putty made of plaster of paris. Then first coat of primer to be applied. After this necessary leveling shall be done with putty & second primer coat shall be applied.					
	The enamel paint of approved shade shall be applied in minimum 3 coats (finishing paint) including scaffolding, cleaning the floors, fittings, furniture's, ladders, glasses, removing of debris out of site etc. complete as per the instructions of the Architect.					
	Mode Of Measurement - Length X Height	10.00	SMT		0.00	
I10	6 mm thk. Acrylic Solid Surface					

	Providing and fixing 6mm thick Approved colour L.G./ MARINO/ DUPOND/GRANIUM MAKE OR Equivalent make (Pure) fixed on plywood OR Partition with necessary adhesive in required shape OR fixed as per Manufacturer's Specification to requiredsurface including moulding etc. complete as per detail drawing and instructions of Architect.					
	Mode Of Measurement - Length X Height	15.00	SMT		0.00	
	TOTAL OF SECTION 'I'				0.00	
	GRAND TOTAL i.e. (A TO I)				**0.00**	
	GST WILL BE EXTRA AS APPLICABLE					

S.No.	Description of items	Qty	Unit	Rate	Amount	Amount (Rs) in words
	SECTION - A : POWER PANELS & DBs					
1	Supply, Installation, Testing, Commissioning of Main Panel, as follows : Refer SLD	1	No.		0.00	
	Main Incommer:					
a	1 Nos. 100A, 3P, 25kA, MCCB with TMD releases & with 1NO+1NC as follows :					
	i. Over load release 0.7 to 1.0 Ir					
	ii. Short circuit release					
	iii. Shunt release under fire					
	iv. Earth Fault release with CBCT					
	v. Rotary operating handle					
	vi. Indication lamps R,Y,B,ON,OFF,TRIP LED type					
b	Load Manager suitable for MD, I, V, KVA, KW, KWH, with required CTs & BMS Port - 1 Sets					
c	Tinned & Sleeved CU Busbar - 4P, 100A.					

d	25kA, 4 Pole voltage Surge protection with 63A, 4P, MCB - 1 No					
	Outgoing:					
e	MCB, 10kA, C-Curve as follows :					
	1. 40/63A, 3P, MCB - 3No.					
	2. 16/25/32A, 3P, MCB - 4No.					
	3. 16/25/32A, 1P, MCB - 6No.					
g	20 KVAR APFCR section: 3 Phase delta connected APP self healing Cap Banks, Auto Manual Switching, 4 Stage Intelligent APFC Relay, Timers, Auxiliary relays etc. Cap Bank to be off with DG Power.					
	The rate shall be including all required Busbar & control wiring. The GA & control circuits shall be first approved, before fabrication.					
	The above complete with all accessories					
2	Supply, Installation, Testing & Commissioning of Distribution Boards complete with MCBs/Isolators/ Bus bars and interconnections. Prefarably standard DB's of specified makes as per list of materials shall be used (DOUBLE DOOR IP42)					
a	ETPN DB as follows : LDBs	1	Nos		0.00	
	Incommer 25A TP MCB-- 1 No.					
	Incommer 25A, 30mA, 2P RCCB- 3 Nos.					
	Outgoing 10A, SP, MCBs -18 Nos (C-Curve)					
	Separate Nuetral Bus for Each Phase to be given					
b	ETPN DB as follows : RPDBs	1	Nos		0.00	
	Incommer 32A TP MCB-- 1 No.					
	Incommer 25A, 100mA, 2P RCCB- 3 Nos.					
	Outgoing 10A, SP, MCBs -18 Nos (C-Curve)					
	Separate Nuetral Bus for Each Phase to be given					
c	ETPN DB as follows : CPDBs	1	Nos		0.00	
	Incommer 32A TP MCB-- 1 No.					
	Incommer 25A, 2P MCB- 3 Nos.					

	Outgoing 10A, SP, MCBs -18 Nos (D-Curve)					
	Separate Nuetral Bus for Each Phase to be given					
d	SPN DB as follows : 3KVA UPS O/P DB	1	Nos		0.00	
	Incommer 25A, DP, MCB-- 1 No.					
	Outgoing 10A, SP, MCBs - 8 Nos (D-Curve)					
e	SPN DB as follows : ELDBs	1	Nos		0.00	
	Incommer 16A, DP, MCB-- 1 No.					
	Outgoing 10A, SP, MCBs - 4 Nos (C-Curve)					
f	SPN DB as follows : ACDBs	1	Nos		0.00	
	Incommer 25A, 100mA, DP, RCBO-- 1 No.					
	Outgoing 16A, SP, MCBs - 6 Nos					
	TOTAL FOR SECTION : A				0.00	
	SECTION - B: LT CABLES					
1	Supply and laying of Aluminium/Copper Armoured (XLPE FRLS) 1.1KV grade, fixed to walls, ceilings or laid in ready-made trench or tied to cables trays with cable ties as follows:					
a	3.5 Core 70 sq. mm. Aluminium Armoured cable.	20	Mtrs		0.00	
b	3.5 Core 50 sq. mm. Aluminium Armoured cable. From Meter Room	30	Mtrs		0.00	
c	3.5 Core 35 sq. mm. Armoured Aluminium cable with twin 8 SWG GI earth	15	Mtrs		0.00	
d	3.5 Core 25 sq. mm. Armoured Aluminium cable with twin 8 SWG GI earth	35	Mtrs		0.00	

e	4 Core 16 sq. mm. Armoured Aluminium cable with twin 10 SWG GI earth	10	Mtrs		0.00	
f	4 Core 16 sq. mm. Armoured Copper cable with twin 10 SWG GI earth	5	Mtrs		0.00	
g	4 Core 10 sq. mm. Armoured Copper cable with twin 12 SWG GI earth	10	Mtrs		0.00	
h	4 Core 6 sq. mm. Armoured Copper cable with twin 12 SWG GI earth	80	Mtrs		0.00	
i	4 Core 4 sq. mm. Armoured Copper cable with twin 14 SWG GI earth	30	Mtrs		0.00	
j	4 Core 2.5 sq. mm. Armoured Copper cable with twin 14 SWG GI earth	QRO	Mtrs		0.00	
k	3 Core 6 sq. mm Armoured Copper cable.	10	Mtrs		0.00	
l	3 Core 4 sq. mm Armoured Copper cable.	100	Mtrs		0.00	
m	3 Core 2.5 sq. mm Armoured Copper cable.	50	Mtrs		0.00	
2	Termination of the above cables with Heavy duty double compression Brass cable glands & copper heavy duty lugs with bi metallic rings. (4c/3.5c/3c)					
a	3.5 Core 70 sq. mm. Aluminium Armoured cable.	2	Nos.		0.00	
b	3.5 Core 50 sq. mm. Aluminium Armoured cable.	2	Nos.		0.00	

c	3.5 Core 35 sq. mm. Aluminium Armoured cable.	2	Nos.		0.00	
d	3.5 Core 25 sq. mm. Aluminium Armoured cable.	2	Nos.		0.00	
e	4 Core 16 sq. mm. Armoured Aluminium cable	2	Nos.		0.00	
f	4 Core 16 sq. mm. Armoured Copper cable	2	Nos.		0.00	
g	4 Core 10 sq. mm. Armoured Copper cable	2	Nos.		0.00	
h	4 Core 6 sq. mm. Armoured Copper cable	4	Nos.		0.00	
i	4 Core 4 sq. mm. Armoured Copper cable	2	Nos.		0.00	
j	4 Core 2.5 sq. mm. Armoured Copper cable	2	Nos.		0.00	
k	3 Core 6 sq. mm Armoured Copper cable.	2	Nos.		0.00	
l	3 Core 4 sq. mm Armoured Copper cable.	4	Nos.		0.00	
m	3 Core 2.5 sq. mm Armoured Copper cable.	2	Nos.		0.00	
3	Supply & Laying flexible FRLS Copper Cables for UPS / Inverter Input & Output Connections in flexible GI metal conduits including terminations with copper lugs & all required accessories: (For UPS/Inverter - I/P & O/P Leads)					
a	Single Core 35 Sqmm Copper cable (Meter - I/P & O/P)	35	Mtrs		0.00	

b	Single Core 16 Sqmm Copper cable	5	Mtrs		0.00	
c	Single Core 10 Sqmm Copper cable	10	Mtrs		0.00	
d	Single Core 4 Sqmm Copper cable (For 3kVA UPS I/P & O/P)	35	Mtrs		0.00	
e	Single Core 2.5 Sqmm Copper cable (For 1kVA INVERTER I/P & O/P)	35	Mtrs		0.00	
	TOTAL FOR SECTION : B				0.00	
	SECTION - C: CABLE TRAY & RACEWAYS					
1	Supply & installations of Pre Galvanised 40 microns, 2.0mm Thick, 50mm height, readymade Mild Steel Ladder Type cable trays complete with couplers, bends, reducer, elbows etc. The rate to include supports of 25x25mmx3mm of MS angle with 10mm verticle rods fixed with 8mm Anchor fasteners. The vertical support shall be placed at interval of not more than 1.5 Metrs & at all bends. All Vertical MS supports shall be spray painted with two coats of red oxide treatment & synthetic enamel paint. All bends shall be smooth as per cable allowable bending radius. (For power cables)					
a	300mm wide	10	Mtrs.		0.00	
b	150mm wide	25	Mtrs.		0.00	

2	Supply & installations of Pre Galvanised 40 microns, 2.0mm Thick, 50mm height, readymade Mild Steel Plain GI Trunking (With Removable Top Cover) complete with couplers, bends, reducer, elbows etc. The rate to include supports of 25x25mmx3mm of MS angle with 10mm verticle rods fixed with 8mm Anchor fasteners. The vertical support shall be placed at interval of not more than 1.5 Metrs & at all bends. All Vertical MS supports shall be spray painted with two coats of red oxide treatment & synthetic enamel paint. All bends shall be smooth as per cable allowable bending radius. (For IT cables)					
a	300mm wide	35	Mtrs.		0.00	
b	150mm wide	25	Mtrs.		0.00	
3	Supply & installations of Pre Galvanised 40 microns, 2.0mm Thick, 60mm height, readymade Mild Steel Perforated type cable trays, complete with couplers, bends etc.The Cable tray shall be fixed to the Floor with GI C- Clamps of 50mm x 5mm thk, on which the Cable tray shall be fixed. The clamps shall be fixed to floor with 6mm anchore Bolts . The rate to include all materials & labour. (For under false floor - power & data cables - In Server Room / Hub Room)					
a	450mm wide	10	Mtrs.		0.00	
b	300mm wide	7	Mtrs.		0.00	
c	150mm wide	8	Mtrs.		0.00	

4	Preparation of trenches upto 20" wide by carefully removing the floor tiles & malwa below the tiles for laying Raceways/conduits for power, Data, voice etc. The depth of the trenches shall be atleast 60mm from the finished floor level or upto RCC of the slab. The rate shall include filling the trenches with rich mix of 1 : 2 PCC after laying of the Raceway/conduits for smooth finish upto original tile level. The rate shall not include the cost of the Raceways/conduits.	200	Mtrs.		0.00	
5	Supply and laying Raceways/Conduits in the trenches as detailed above or through partitions with all accessories, bends, pull wire separately. The metal conduits / Raceways shall be earth. The rate include all accessories but excluding the floor mounted junction boxes which shall be paid. the rate shall include bends, couplers etc.					
a	125mm x 40mm Aluminium Section,2.0mm Thk.	0	Mtrs.		0.00	
b	100mm x 40mm Aluminium Section,2.0mm Thk.	50	Mtrs.		0.00	
c	83mm x 38mm Aluminium Section, 1.60mm Thk.	QRO	Mtrs.		0.00	
d	63mm x 38mm Aluminium Section, 1.60mm Thk.	15	Mtrs.		0.00	
e	32mm HMS PVC Conduits (Floor Conduits)	10	Mtrs.		0.00	
f	25mm HMS PVC Conduits (Floor Conduits)	300	Mtrs.		0.00	
g	25mm MMS PVC Conduits (For Wi-Fi, AV etc. on Wall / Ceiling)	150	Mtrs.		0.00	

h	25mm Medium Guage ERW MS Metal Conduits	15	Mtrs.		0.00	
i	25mm GI Flexible Conduits	5	Mtrs.		0.00	
6	Supply & installations of MS Powder coated, Junction Boxes made of 2.0 mm thk/1.6mm thk, with removal S.S. Top Cover 2.0mm thk, all side entries for raceways, complete with all accessories. The rate to include fixing the juncrtion box on the floor Trenches or floor described above. Sample junction box to be approved first.					
a	450mm x 450mm wide x 50mm ht-2.0mm thk	2	Nos		0.00	
b	375mm x 375mm wide x 50mm ht-2.0mm thk	2	Nos		0.00	
c	350mm x 350mm wide x 50mm ht-2.0mm thk	4	Nos		0.00	
d	300mm x 300mm wide x 50mm ht-2.0mm thk	6	Nos		0.00	
e	250mm x 250mm wide x 50mm ht-1.6mm thk	2	Nos		0.00	
f	200mm x 200mm wide x 50mm ht-1.6mm thk	15	Nos		0.00	
g	150mm x 150mm wide x 50mm ht-16.mm Thk	50	Nos		0.00	

7	Supply and fixing GI trunking on wall near DBs with all accessories. The Trunkings / Raceways shall be earth. The rate shall include bends, couplers etc. Following Raceways/trunking will be made out of 16 SWG GI for body and 14 SWG GI for cover. (For DBs)					
a	150mm x 40mm PVC Trunking	15	Mtrs.		0.00	
b	100mm x 40mm PVC Trunking	15	Mtrs.		0.00	
	TOTAL FOR SECTION : C				0.00	
	SECTION - D : POWER OUTLETS & WIRING					
1	Supply and fixing of computer power outlets, Modular type (shuttered) switch sockets.					
a	Set of 3 nos of 6A 3 Pin ISI Socket controlled by 16A Switch. The switch sockets shall be mounted in modular furniture with face plate & without back box as directed.	40	Nos		0.00	
ai	Set of 3 nos of 6A 3 Pin ISI Socket controlled by 16A Switch. The switch sockets shall be mounted in Wall / partition with face plate & Metal back box as directed.	5	Nos		0.00	
	(Make & Model no. : Myrius of Legrand - Model No. 6731 86 for 3 Pin ISI Socket)					
b	Set of 2 nos of 6A 3 Pin ISI Socket controlled by 16A Switch. The switch sockets shall be mounted in modular furniture with face plate & without back box as directed.	5	Nos		0.00	
bi	Set of 2 nos of 6A 3 Pin ISI Socket controlled by 16A Switch. The switch sockets shall be mounted in Wall / partition with face plate & Metal back box as directed.	5	Nos		0.00	
	(Make & Model no. : Myrius of Legrand - Model No. 673044 for 3 Pin ISI Socket)					
c	1Nos 6A 3 Pin ISI Socket & 6A Switch. The switch sockets shall be mounted in modular furniture with face plate & without back box as directed.	45	Nos		0.00	

ci	1Nos 6A 3 Pin ISI Socket & 6A Switch. The switch sockets shall be mounted in Wall / partition with face plate & Metal back box as directed.	10	Nos		0.00	
	(Make & Model no. : Myrius of Legrand - Model No. 673044 for 3 Pin ISI Socket)					
d	1Nos 6A Socket & 6A Switch. The switch sockets shall be mounted in Wall / partition with face plate & Metal back box as directed. (For VRV IDUs & EX. FANs)	15	Nos		0.00	
	(Make & Model no. : Myrius of Legrand - Model No. 673044 for 6A Socket)					
e	1Nos 6/16A, Socket & 16A Switch. The switch sockets shall be mounted in modular furniture with face plate & without back box as directed.	2	Nos		0.00	
ei	1Nos 6/16A, Socket & 16A Switch. The switch sockets shall be mounted in Wall / partition with face plate & Metal back box as directed. (For Café/Pantry/Service sockets)	10	Nos		0.00	
	(Make & Model no. : Myrius of Legrand - Model No. 673045 for 6/16A Socket)					
f	1Nos 6A Socket. The Sockets shall be mounted in Wall / partition with face plate & Metal back box as directed. (For VAVs/MFD)	5	Nos		0.00	
	(Make & Model no. : Myrius of Legrand - Model No. 673044 for 6A Socket)					
g	TV out let socket with face plate & metal back box (At Café)	2	Nos		0.00	
h	6W / 8W Splitter fot TV cables	2	Nos		0.00	
2	Supply, installation of RG6 Unarmoured Co-axial cable for TV with MMS PVC Conduits 25mm/32 mm fixed to walls/Ceiling with Spacers & saddles.	50	Nos		0.00	
3	Supply & Laying flexible Copper Cable (FRLS) for Power sockets for UPS Power /Raw Power through already laid Raceways/conduits/Cable Trays etc.					
a	3 Core 2.5 Sqmm Copper cable. (For workstation power cabling thro. Floor raceways)	1100	Mtrs.		0.00	

b	3 Core 4 Sqmm Copper cable. (For Network rack power cabling)	10	Mtrs.		0.00	
c	3 Core 6 Sqmm Copper cable. (For Server rack power & control room rack cabling)	10	Mtrs.		0.00	
4	Supply, installation, testing & comissioning of MCB's in Metal boards, as follows:					
a	16/25A/32A, DP, MCB in Metal boards in IP42 enclosure (For 3Kva UPS I/P & 1Kva Inverter I/P & O/P)	4	Nos		0.00	
b	16/25A/32A, DP, MCB in Metal boards in IP55 enclosure (For Outdoor Hiwall Acs)	1	Nos		0.00	
c	16/25A/32A, SP, MCB in Metal boards in IP42 enclosure	2	Nos		0.00	
d	20A, 2P+E, Reyrol Plug & Socket with 16/20A SP MCB in IP42 Metal enclosure.	2	Nos		0.00	
e	32A, 2P+E, Reyrol Plug & Socket with 32A SP MCB in IP42 Metal enclosure.	1	Nos		0.00	
f	32A, 3P+N+E, Reyrol Plug & Socket with 16/20/25/32A TP MCB in IP42 Metal enclosure.	1	Nos		0.00	
g	63A, 3P+N+E, Reyrol Plug & Socket with 40/63A TP MCB in IP42 Metal enclosure.	5	Nos		0.00	
h	20A, 2P+E, IEC, Interlockable Plug & Socket with IP42 Enclosure of SCAME Make (For Server / IT & Network Racks)	2	Nos		0.00	
i	32A, 2P+E, IEC, Interlockable Plug & Socket with IP42 Enclosure of SCAME Make (For Server / IT & Network Racks/ Cotrol room rack)	1	Nos		0.00	
j	16/25/32A, 4P, RCBO, 300mA in Metal boards in IP55 enclosure (For VRF ODU)	1	Nos		0.00	

k	40/63A, 4P, RCBO, 300mA in Metal boards in IP55 enclosure (For VRF ODU)	1	Nos		0.00	
l	SITC of 100A MCCB, TPN, 25kA, Thermal Magnetic, at Meter room with operating Handle in MS Powder coated enclosure with Gland Boxes. (At GF Meter room)	1	Nos		0.00	
	TOTAL FOR SECTION : D				0.00	
	SECTION - E : POINT WIRING					
1.1	Point wiring through MMS 25mm/20mm PVC Conduits with 3 Nos of 1.5 sqmm (Phase, Neutral & Earth), PVC Insulated Copper Conductors FRLS Grade, controlled from MCB in DB . The Light Points from Switch Board/Sensor to First/Primary Point shall be with 3 Nos of 1.5sqmm. Looped Points from primary to secondary shall also be with 3x1.5sqmm FRLS grade copper wires. Note that the indirect lighting points shall be considered as one single point & no secondary point will be allowed. Similarly Line Light connections shall be internal & shall not be considered for secondary point. The Point wiring shall be directly terminated in the fitting through PVC Flexible conduit & coupling (from ceiling to fitting). The cost for circuit wiring (3x1.5Sqmm) from DB to Switch board & Switch board to switch board shall be included in the point wiring.					
a	For primary normal light points controlled from Switch boards with 6A Modular switches.	23	Nos		0.00	
b	For Secondary light points - Looped from Primary Points / Sensors	50	Nos		0.00	
c	For Secondary light points - Looped from Sensor to Sensor.	10	Nos		0.00	
d	For Secondary Emergency light points - Looped from Primary Emergency light points	5	Nos		0.00	

e	For Primary light points - DB to 1st Sensor / 1st Light point	2	Nos		0.00	
f	For Primary Emergency light points - Emergency DB to 1st Light point	10	Nos		0.00	
g	Bypass Switch Point - 2 Nos. 1.5 sq.mm Wiring from sensor to switch including switch	8	Nos		0.00	
h	For Exhaust Fan Points with 6A Socket near Fan & 6A Switch on nearest Lighting Switchboard.	3	Nos		0.00	
2	Supply & Laying Circuit Mains for Power sockets/DBs through 25 mm. Black enameeled MS conduits, MMS as follows: (The rate shall include the cost of conduits & all accessories). Wires FRLS					
a	3 Nos.of 1.5 sq. mm. PVC insulated copper conductors - For VAV/MFDs	10	Mrts.		0.00	
b	3 Nos.of 2.5 sq. mm. PVC insulated copper conductors -For AC/Vent; Service sockets, Pantry etc.	10	Mrts.		0.00	
c	2 Nos. of 4 sq. mm + 2.5 sq. mm. PVC insulated copper conductors - For Café Eqpts	10	Mrts.		0.00	
	OR					
2.1	Supply & Laying Circuit Mains for Power sockets/DBs through 25 mm. PVC conduits, MMS as follows: (The rate shall include the cost of conduits & all accessories). Wires FRLS					
a	3 Nos.of 1.5 sq. mm. PVC insulated copper conductors - For VAV/MFDs	10	Mrts.		0.00	
b	3 Nos.of 2.5 sq. mm. PVC insulated copper conductors -For VRV IDU/AC/Vent; Service sockets, Pantry etc.	500	Mrts.		0.00	
c	2 Nos. of 4 sq. mm + 2.5 sq. mm. PVC insulated copper conductors - For Café Eqpts	20	Mrts.		0.00	

	TOTAL OF SECTION : E				0.000	
	SECTION - F : EARTHING SYSTEM					
1	Supply and installation of "Chemical Earthing elecrode 80mm dia,Type-39 (Special), burried in ground at depth of 3.0M from ground level with Chemical compound filling. A brick work chamber with plaster to be provided of 300x300x300 Deep with cast Iron cover 10mm thk. with frame and lockable facility. A Test link shall be provided in the Chamber for Testing Purpose. Make Ashlok or Equivalent	1	Nos		0.00	
2	Supply and laying of earthing strips from earthing chamber to varoius Power Panels and terminating the same. Strip to be laid through cable trenches/cables trays with required clamping arrangement. The portion on building wall & upto the main panel shall be fixed with spacers and saddles. Joints shall be lap welded/souldered & coated with bitumen. The rates shall include cost of all materials & accessories.					
a	50mm x 6mm GI earthing strip	10	Mrts.		0.00	
b	32mm x 6mm GI earthing strip	10	Mrts.		0.00	
c	25mm x3mm GI earthing strip (From 7th floor Meter room to 12th floor electrical room/panel)	75	Mrts.		0.00	
3	Supply & laying of single core flexible FRLS Copper Cables through MMS PVC conduits of suitable sizes thro' ducts,trays etc. The rates shall include cost of all materials & accessories including termination.					
a	Single Core 4 Sqmm Copper cable without Conduit	10	Mrts.		0.00	

b	Single Core 2.5 Sqmm Copper cable without Conduit (For Server dedicated earth & 3kVA UPS/Batt body earth Tapp from Common GI patti near main panel)	100	Mrts.		0.00	
4	Supply, Installation, Testing, Commissioning of Earth Bus of following sizes inside powder coated MS fabricated box to be mounted on insulator as follows:					
a	25mm x 3mm x 200mm Long Copper Bus	2	Nos		0.00	
5	Supply & laying of CU/GI Bare wires through cable trenches, laid cable trays etc. The rates shall include cost of all materials & accessories including termination.					
a	8 SWG GI Wire	15	Mrts.		0.00	
b	8 SWG CU Wire	10	Mrts.		0.00	
	TOTAL OF SECTION : F				0.00	
	SECTION - G : MISCELLENOUS					
1	Supply & Installation of 1.0 kVA Invertor, 1Phase input & 1 Phase output with 90.0 Minutes Battery back up time SMF batteries with overload, short circuit protection.	1	Nos		0.00	
2	Supply & Installation of 1.1KV Grade Rubber Mats.	3	Sqmt.		0.00	
3	Supply & Installation of Danger Notice Board etc	1	Nos		0.00	
4	Supply & Installation of Charts//Single Line Diagram duly framed with front glass.	1	Job		0.00	

5	Arranging temporary Power & Lighting for all agencies to work including suitable protection through MCBs/ELCBs/MCCBs & wiring & cabling. 3 Locations with switch Boards containing 4 Nos of 6A/16A Switch sockets plus two nos of Metal Clad sockets (Single Phase) & one 3 Phase 16A, 5 Pin Metal socket or 16A 3Phase MCB at each location. The Temporary Lighting shall have an average of 150 to 200 Lux at all places maintained. Temporary Power required is approx 15 Kw , which shall be coordinated with Developer for required Tap-off arrangement at each floor. The rate shall include preparation of AS-BUILT drawings, submission of handing over documents, testing of the installation & preparaition of test report as required by statutary bodies.	1	Job		0.00	
6	Obtaining statutary aproval from Local Electrical Inspectorate & other required satatutary bodies. The contractor shall submit all test documents, Load sheets, SLD's as required by Local inspectorate	1	Job		0.00	
	TOTAL OF SECTION : G				0.00	
	SECTION - H : LIGHT FIXTURES					
	Note:					
	a. Wattages & Qty of light fixtures may subject to change basis final lux plot from finalized lighting vendor					
	b. Color temperature as per Client/Archietct's choice					
1	Supply, Installation, Testing & Commissioning of 2' x 2' 30W LED Light fixture, 5700K, complete with Driver & all required accessories.The fitting shall be recessed mounted in false ceiling. (Oppen office area)	30	Nos		0.00	
	Make & Model : CRCO10R030HP40G4 of Wipro or equivalent					
2	Supply, Installation, Testing & Commissioning of 15W LED Recessed Down Light, 5700K, complete with Driver & all required accessories.	20	Nos		0.00	
	Model & Make : LD06-171XXX-57SMG1 of Wipro or equivalent (Meeting Room & Cabin)					

3	Supply, Installation, Testing & Commissioning of 9W LED Recessed Light, 5700K, complete with Driver & all required accessories.	25	Nos		0.00	
	Model & Make : LD06-151-XXX-57-XX of Wipro or equivalent (Passage & toilet)					
4	Supply, Installation, Testing & Commissioning of LED strip light 10W/Meter, 4000K, complete with driver, fixing arrangement, for cove lighting etc.	100	Mtrs		0.00	
	Model & Make : LS06-010-120-40-50 of Wipro or equivalent					
5	Supply, Installation, Testing & Commissioning of 1200mm Recessed 10W LED profile light, 4000K, complete with Driver & all required accessories.	70	Nos		0.00	
	Model & Make : LM37R-101-XX-40-G2 of Wipro or equivalent					
6	Supply, Installation, Testing & Commissioning of 1200mm, 40W Linear LED Batten complete with Driver & all required accessories.	2	Nos		0.00	
	Model & Make : LL24-541-XXX-57-XX of Wipro or equivalent					
7	Supply & Installation of 400mm Wall mounted fan with connecting wires and all required accessories complete, etc.	2	Nos		0.00	
	Make : Orient , Usha , Bajaj , Havles					
8	Supply & Installation of Heavy duty Exhaust fans of window mounted type with bird screen and louvered shutters – 9 inch dia of approved make and colour or Approved equivalent.	3	Nos		0.00	
	Make : Orient , Usha , Bajaj , Havles					
	TOTAL OF SECTION : H				0.00	
	SUMMARRY					
1	SECTION A : POWER PANELS & DBs				0.00	
2	SECTION B : L.T CABLES				0.00	

3	SECTION C : CABLE TRAYS & RACEWAYS				0.00	
4	SECTION D : POWER OUTLETS & WIRING				0.00	
5	SECTION E : POINT WIRING				0.000	
6	SECTION F : EARTHING				0.00	
7	SECTION G : MISCELLENOUS				0.00	
8	SECTION H : LIGHT FITTINGS				0.00	
	TOTAL SECTION A TO H				**0.00**	
	GST WILL BE EXTRA AS APPLICABLE					

S.No.	Description of items	Qty	Unit	Rate	Amount	Amount (Rs) in words
A	SITC HORIZONTAL CABLING COMPONENT FOR DATA					
1	CATEGORY-6, 4PAIR UTP CABLE	8	BOX		0.00	
2	CAT-6, INFORMATION OUTLET	72	NOS		0.00	
3	CAT-6, 24 PORT LOADED JACK PANEL - FOR DATA ACTIVE & REDUNDANT	3	NOS		0.00	

4	CAT-6 7FT PATCH CORD - AT WORKSATION END - FOR ACTIVE DATA NODES	55	NOS		0.00	
5	CAT-6, 7FT PATCH CORD - AT RACK END - FOR ACTIVE DATA NODES	55	NOS		0.00	
B	SITC HORIZONTAL CABLING COMPONENT FOR VOICE					
1	CATEGORY-6, 4PAIR UTP CABLE	5	BOX		0.00	
2	CAT-6, INFORMATION OUTLET	46	NOS		0.00	
3	CAT-6, 24 PORT LOADED JACK PANEL - FOR VOICE AT FIELD SIDE	2	NOS		0.00	
4	CAT-6, 24 PORT LOADE JACK PANEL - FOR VOICE AT RISER SIDE	2	NOS		0.00	
5	CAT-6, 3FT PATCH CORD - AT RACK END - FOR ACTIVE VOICE NODES ONLY	46	NOS		0.00	
B	SITC FACE PLATES & METAL BACK BOXES FOR DATA & VOICE					
1	FACE PLATE DUAL/QUAD - FOR DATA & VOICE	52	NOS		0.00	
2	2 MODULE SURFACE MOUNTED METAL BACK BOX - ON WALLS ETC.	10	NOS		0.00	
C	SITC BACK BONE					
1	6 CORE 50/125 U MM UNARMOURED FIBER CABLE	10	MTRS		0.00	
2	600 G2 SHELF	2	NOS		0.00	

3	600 G2 LC 24 DUPLEX PANEL	1	NOS		0.00	
4	ROLO SPLICE TRAY	1	NOS		0.00	
5	LC DUPLEX ADAPTER	1	NOS		0.00	
6	LC 50/125 U MM, PIGTAILS	1	NOS		0.00	
7	Duplex,LC-LC , 50/125 U MM FIBER OPTIC PATCH CORD, 10 FEET	1	NOS		0.00	
D	SITC VOICE BACKBONE -					
1	SITC OF KRONE MDF, WITH REQUIRED CABLE MANAGERS, LABELLING, ETC. THE KRONE SHALL BE FIXED ON 20MM MARINE PLY BOARD DULY PAINTED.					
a	(50+50) PAIR MDF IN SERVER ROOM	1	NOS		0.00	
2	25 PAIR UNRMOURED RISER CABLE - FROM JACK PANEL TO EPBX/KRONE	25	MTRS		0.00	
3	SITC of Riser cables for voice					
a	20 PAIR ARMOURED RISER CABLE	20	MTRS		0.00	
b	50 PAIR UN-ARMOURED RISER CABLE	15	MTRS		0.00	
c	100 PAIR UN-ARMOURED RISER CABLE	15	MTRS		0.00	
E	NETWORK RACK					
1	15U, 600x600MM, WALLMOUNT CLOSED NETWORK RACK WITH DUAL POWER STRIP (16A, IEC SOCKETS) & COMPLETE WITH CABLE MANAGERS, REQUIRED SUPPORTS, ETC. : NETWORK RACKS	1	NOS		0.00	

E	SCANNING, CERTIFICATION, DOCUMENTATION & ASBUILT DRAWINGS.	1	LS		0.00	
	TOTAL				**0.00**	

S.No.	Description of items	Qty	Unit	Rate	Amount	Amount (Rs) in words
1	Supply of Out Door/Indoors Units suitable for VRF / VRV System Bluestar,Daikin, Mitsubishi, VOLTAS,Carrier- TOSHIBA,HITACHI.					
	Supply of vrf outdoor units, with multi/single scroll compressors (minimum one/two compressors) with inverter type compressor, special pre- coated fins, panel, corrosion resistant (suitable for seaside installation) coated condenser, inverter-based condenser fan M.S.hot dip galvanized stands / supports, electrical & microprocessor panel, isolating valves and all the necessary accessories for proper functioning of the units, having following approximate capacities. Outdoor units suitable for following capacities:					
	Note: Fins and copper tubes of Air Cooled Condenser along with copper tubing / piping with all joints and U-Bends exposed to coastal areas corrosive atmosphere / aggressive ambient, shall be painted with special corrosion prevention coating either in factory or at site Note: Fins and copper tubes of Air Cooled Condenser along with copper tubing / piping with all joints and U-Bends exposed to coastal areas corrosive atmosphere / aggressive ambient, shall be painted with special corrosion prevention coating either in factory or at site					
a	22 HP VRF ODU	1	No		0.00	

2	Supply of VRF based Indoor units complete with remote control and all accessories, Vibration isolators & supports. The indoor unit shall be suitable for a power supply of 240V/ 1 phase/ 50Hz OR 415V / 3 phase / 50Hz.					
	4-way Cassette Type Indoor Units, unit shall be complete with wireless remote controller					
a	3.3 TR Cassette	5	nos		0.00	
3	1-way Cassette Type Indoor Units, unit shall be complete with wireless remote controller					
a	2.07 TR 1 way Cassette	1	nos		0.00	
b	1.65 TR 1 way Cassette	1	nos		0.00	
c	1.05 TR 1 way Cassette	2	nos		0.00	
4	Refnet Joints					
a	Supply of Refnet Joints	8	nos		0.00	
	SECTION 'A' TOTAL				0.00	
	B-SECTION					
	Installation of VRF/ VRV system					
1	Installation, Testing and Commissioning of Out Door Units suitable for VRF / VRV System & -Price shall inclusive of Pressure testing, LIFTING SHIFTING OF ALL VRF UNITS, and other necessary accessories Pressure Testing, Nitrogen flushing, testing & commissioning of the air-conditioning system					
a	22 HP VRF ODU	1	nos		0.00	

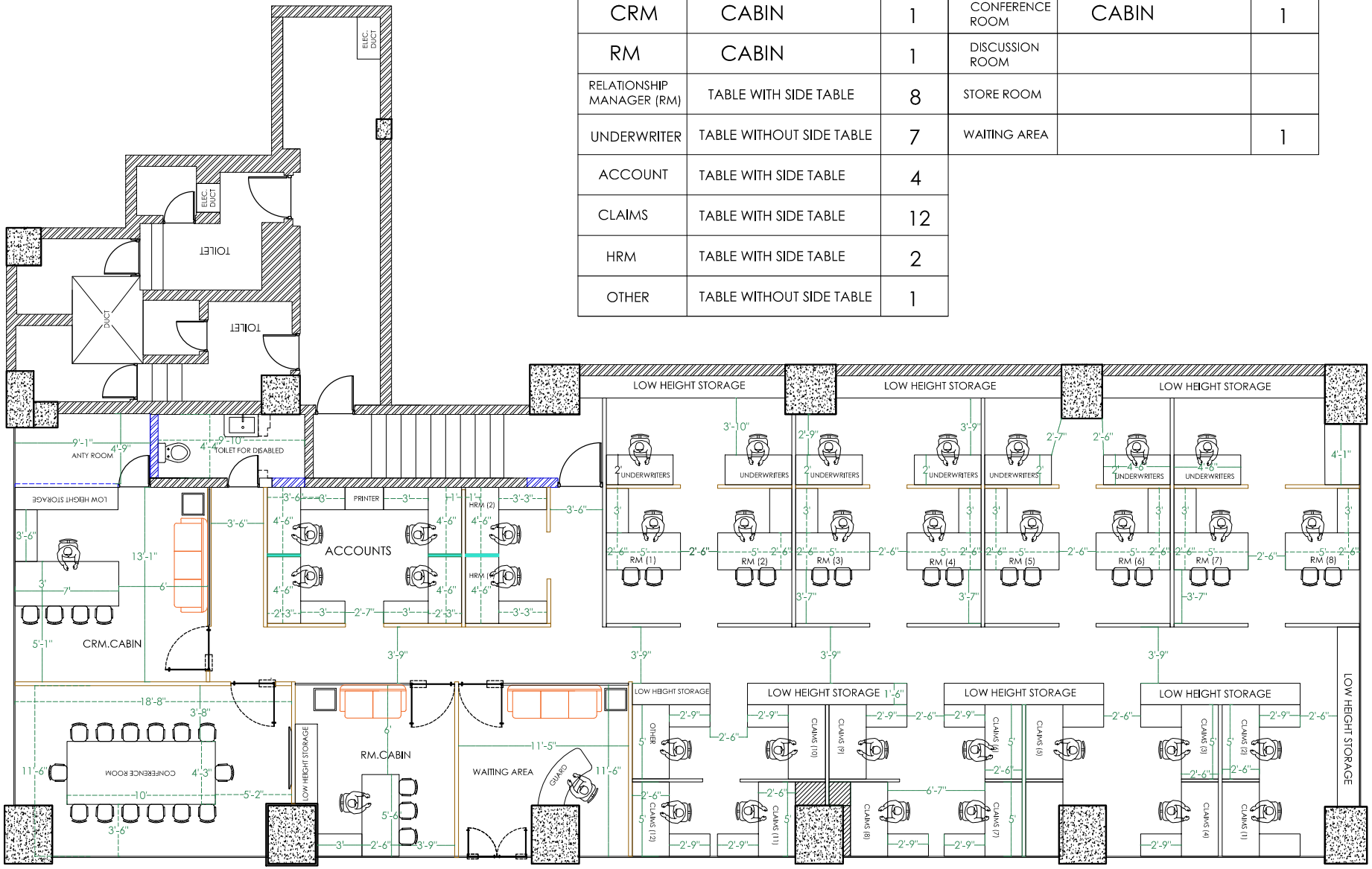
2	Installation, Testing and Commissioning of Indoor Units suitable for VRF / VRV System. Costs shall include hanging / mounting arrangements for the respective IDUs and shall also include for wall mounting of remote controllers near respective units and LIFTING,SHIFTING, ERECTION.					
a	VRV 4-way Cassette Type Indoor Units, unit shall be complete with wireless remote controller					
	Cassette Unit	9	nos.		0.00	
3	REFRIGERANT PIPING FOR VRF					
	Supply, installation, testing & commissioning of the insulated refrigerant piping for all the units as per specifications with insulation of thick Nitrile rubber throughout the running length of the refrigerant piping with supporting arrangements					
	Copper Ref.Hard / soft pair Ref piping pair (liquid+suction) of the required sizes for all the units with refnets as per specs. The insulation shall be of 19mm/13mm thick Armaflex make through out the running length of Ref. piping. The piping shall be well supported at specific intervals with GI supports with insulated PUF saddles and installed on GI cable trays supported from wall / roof with anchor fasteners & C type ms angle.	100	mtrs		0.00	
4	CONTROL CABLING FOR VRF					
	Supply, installation, testing & commissioning of the control cabling from indoor to outdoor unit .& from indoor to outdoors unit and from outdoor to central controller 3cX2.5 sq. mm. shielded communication copper cable(Polycab/RR/Havells)	150	mtrs		0.00	
5	DRAIN PIPING FOR VRF UNIT					
	Drain water piping work out of 25/32 mm PVC/HDPE hard pipes covered with Hilton insulations, complete with fittings, bends, elbows, tees flanges, tappings, wall sleeves, hangers, supports, anchors (Price/Diamond/New India Trading)	110	Mtr		0.00	

6	Exhaust air with cowl-ventilation duct	2	nos		0.00	
7	GI CABLE TRAY 200mm wide,22swg	10	mtrs		0.00	
8	M. S. Epoxy Painted Stand for VRV Outdoor Unit with screw, nut bolt anchor fastner etc. complete in all aspect. As per the instructions of the Architects/ Engineer	2	Nos		0.00	
9	REFREGERENT 410 GAS FOR VRF	22	Kg		0.00	
10	Core Cuttings & filling the same with cement and access	8	Nos		0.00	
11	Necessary civil work : Trenching work / Making & remaking of holes in walls, final finishing the same in all respects pop,cements,etc with labour charge for same including loading and unloading. charges and trenching work if required.	1	Lot		0.00	
	SECTION 'B' TOTAL				0.00	
	TOTAL OF HIGH SIDE-A				0.00	

	TOTAL OF LOW SIDE-B				0.00	
	TOTAL (A+B)				0.00	
	Less Offer Saves: Removing of existing AC duct with Branches including Grill ,suspension rods, Air conditioning system diffusers etc.and carting away debries out of the site including cleaning the site and offer solvage for the same etc. complete as per instructions of architect.					
	GRAND TOTAL (A+B) (Excluding GST)				**0.00**	

LEGEND		
CRM	CABIN	1
RM	CABIN	1
RELATIONSHIP MANAGER (RM)	TABLE WITH SIDE TABLE	8
UNDERWRITER	TABLE WITHOUT SIDE TABLE	7
ACCOUNT	TABLE WITH SIDE TABLE	4
CLAIMS	TABLE WITH SIDE TABLE	12
HRM	TABLE WITH SIDE TABLE	2
OTHER	TABLE WITHOUT SIDE TABLE	1

LEGEND		
CONFERENCE ROOM	CABIN	1
DISCUSSION ROOM		
STORE ROOM		
WAITING AREA		1



PROPOSED FURNITURE LAYOUT

New India Assurane Co. Ltd.

GROUND FLOOR, 17A, COOPERAGE ST, DR AMBEDKAR STATUE CHOWK AREA, COLABA, MUMBAI, MAHARASHTRA 400001

DRAWING NO.

ALT 1

DRAWN BY: PRANITA

DATE: 30-08-2023

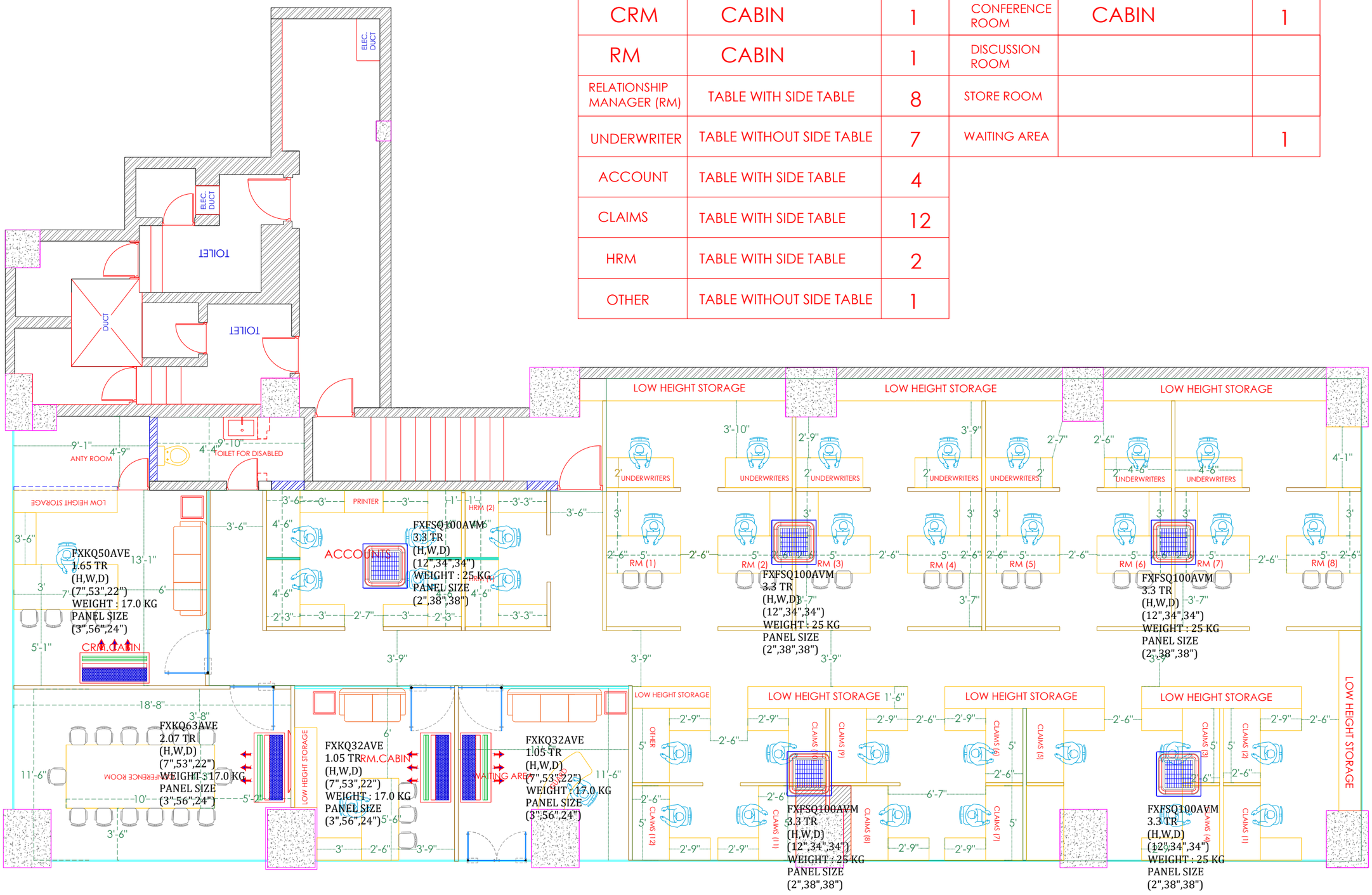
CHECKED BY MR.RAJAN INDULKAR

Scale : N.T.S.

DILIP KULKARNI & ASSOCIATES
ARCHITECT & INTERIOR DESIGNER,
15/3, 2ND FLOOR, METRO HOUSE, "C" WING, OPP. HOTEL DELHI DARBAR,
SHAHID BHAGAT SINGH ROAD, COLABA, MUMBAI 400 001.
MOBILE:98200 76349 / 97694 01774
Email Id: dkulkarniasso@gmail.com / rajandk1956@gmail.com

LEGEND		
CRM	CABIN	1
RM	CABIN	1
RELATIONSHIP MANAGER (RM)	TABLE WITH SIDE TABLE	8
UNDERWRITER	TABLE WITHOUT SIDE TABLE	7
ACCOUNT	TABLE WITH SIDE TABLE	4
CLAIMS	TABLE WITH SIDE TABLE	12
HRM	TABLE WITH SIDE TABLE	2
OTHER	TABLE WITHOUT SIDE TABLE	1

LEGEND		
CONFERENCE ROOM	CABIN	1
DISCUSSION ROOM		
STORE ROOM		
WAITING AREA		1



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DRAWING NO.

ALT 1

DRAWN BY: PRANITA

DATE: 30-08-2023

CHECKED BY MR.RAJAN INDULKAR

Scale : N.T.S.

DILIP KULKARNI & ASSOCIATES
ARCHITECT & INTERIOR DESIGNER,
15/3, 2ND FLOOR, METRO HOUSE, "C" WING, OPP. HOTEL DELHI DARBAR, SHAHID BHAGAT SINGH ROAD, COLABA, MUMBAI 400 001.
MOBILE:98200 76349 / 97694 01774
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