

NTT NO	SBI/HYD/2026-27/009
DATE	25.06.2026

**PROPOSED VRF AC WORKS FOR RENOVATION OF DEPARTMENT OF
STATE BANK OF INDIA IN GROUND FLOOR, CMP BUILDING, LINGAMPALLY
POST, HYDERABAD, TELANGANA-500019.**



TENDER SCHEDULE.

*** VRF AC works contractors who are empanelled with SBI-LHO, Hyderabad as Rs. 50 lakhs and above category are only eligible to participate***

**The Assistant General Manager (Admin),
State Bank of India,
Internal Audit Department,
Admin Wing, Corporate Centre,
State Bank Nireekshan Bhavan,
Lingampally Post, Hyderabad
Telangana - 500019
Ph No:040 23012139
Email: agmadmin.iahyd@sbi.co.in**

CONSULTANTS:



**M/S abhikram-s
architects, interior designers, urban planners
valuers & project managers
#3-6-134 FLAT NO 302
SVC ROYAL DM APARTMENTS
STREET NO 18, HIMAYATNAGAR
HYDERABAD-500029
ph.no 040-35561296
abhikramarchitects@gmail.com**

1. NOTICE INVITING TENDER (NIT)

NAME OF WORK: On behalf of SBI invites e-TENDER FOR PROPOSED VRF AC WORKS FOR RENOVATION OF DEPARTMENT OF STATE BANK OF INDIA IN GROUND FLOOR, CMP BUILDING, LINGAMPALLY POST, HYDERABAD, TELANGANA-500019.

1.	Name of the work	e-TENDER FOR PROPOSED VRF AC WORKS FOR RENOVATION OF DEPARTMENT OF STATE BANK OF INDIA IN GROUND FLOOR, CMP BUILDING, LINGAMPALLY POST, HYDERABAD, TELANGANA-500019.		
2.	Estimated cost	Rs. 29,36,100.00/- + CAMC + plus GST		
3.	Quantum of Earnest Money Deposit (EMD)	Rs. 30,000.00/- Drafts/BCs shall be in favor of “Assistant General Manager, (Admin), Internal Audit Dept, Hyderabad” Payable at Hyderabad.		
4.	Preferred make of ACs	1. Voltas	6. Mitsubishi Heavy	
		2. Bluestar	7. Daikin	
		3. Carrier	8. O’General	
		4. LG	9. Toshiba	
		5. Panasonic	10. Hitachi	
6.	Date and Time where tender forms are available	FROM 25.06.2026 at www.sbi.co.in/ SBI in the News procurementnews and https://etender.sbi		
7.	Last date and time of submission of online Tender	11.07.2026 Up to 03:00PM		
8.	Place, date & time for submission of e tender Contact person /telephone no/email address.	a) On line submission up to 11.07.2026 Up to 03:00PM at https://etender.sbi b) EMD & Cost of tender Document submission Address: The Assistant General Manager (Admin), State Bank of India, Internal Audit Department, Admin Wing, Corporate Centre, State Bank Nireekshan Bhavan, Lingampally Post, Hyderabad Telangana – 500019. 11.07.2026 Up to 03:00PM Contact: Assistant General Manager (Admin) Ph No:040 23012139 Email: agmadmin.iahyd@sbi.co.in		
9.	Date, Time and Place of opening of e-Tenders	11.07.2026 Up to 03:00PM The Assistant General Manager (Admin), State Bank of India, Internal Audit Department, Admin Wing, Corporate Centre, State Bank Nireekshan Bhavan, Lingampally Post, Hyderabad Telangana – 500019.		
10.	Quantum of Security Deposit (percentage)	1. Initial Security Deposit (ISD) – 2% of the Tender value including EMD		

		2. Retention Money- 5 %of the running bills and Total deduction of 5% of value of work including EMD, ISD.
11.	Terms of payment of Bills, if any (specify the minimum value of work for payment of running account bills)	Each running bill of Rs. 30.00 Lacks and above
12.	Stipulated time for completion of the Work/supply.	60 Days
13.	(Penalty clause) Liquidated Damages	@ 0.5% of the value of work per week of delay subject to a maximum penalty of 5% of the value of work would be strictly imposed.
14.	Validity period of the tender.	Twelve (12) Months
15.	Defect Liability Period	Twelve (12) Months
16.	Eligible Taxes	A)Income Tax & GST IT will be deducted at source as per Govt. Guidelines. B) Reimbursement of GST will be made only on submission of proper GST invoice as per applicable GST provision. The contractor should comply with the following; 1. Contractor should have GST Registration Number 2. Invoice should specifically/separately disclose the amount of GST levied at applicable rate as per GST provision 3. In case of Correction in the bills after scrutiny, contractor should submit fresh bills for payment 4. Contractor should timely file his GST return in accordance with GST provisions to enable the bank to claim the credit of GST paid to the contractor 5. The GST Number of State Bank of India are For Telangana State -36AAACS8577K1ZQ
17.	Electronic Payment	Payment shall be made by way of Electronic fund transfer and the bill will be paid by the Branch . Firm should furnish details of the bank, a/c no, IFSC code
18.	For Digital Signature Certificate related query	Contact no. : 9099090830 Email on info@abcProcure.com
19.	Tender submission Guidance	+91 7859800621 6352632098 6352631766 6352631968 9374519754
20.	Any additional Information	The quoted rate should be inclusive of materials, labour, wages, fixtures, transportation, installation, all taxes (excluding GST), wastages, Octroi, machinery, temporary works such as scaffolding, cleaning, overheads, profit, statutory expenses, incidental charges and all related expenses to complete the work

21.	EVALUATION OF PRICE BIDS AND FINALIZATION	1. Only those Bidders who qualify in Technical evaluation would be shortlisted and the online price bid submitted by the bidder will be opened. 2. The L1 Bidder will be selected on the basis of net total of the price evaluation as quoted in the Online bidding. 3. In case, the L1 amount quoted by two or more contractors is the same, such lowest contractors will again be asked to submit sealed / online “ Revised + Percentage Offers” on the original Estimated Cost of tender but the revised percentage shall, in no case, be higher than the percentage quoted during their initial offer for the project. The L1 shall be decided on the basis of revised offers. 4. The process of online rebidding amongst the two or more contractors offering same rates shall continue till L1 bidder is discovered. If required, PL shall conduct reverse auction to discover the L1 bidder. 5 In case, any of such contractors or all contractors (who have quoted same tender amount in the initial bidding or subsequent bidding) refuse to submit revised offer, it shall be treated as “Withdrawal of tender” by the Contractor before acceptance by PL and the EMD of such contractors shall be forfeited and they shall not be allowed to participate in the re-tendering process for the work. 6. If the final L1 bid is unreasonably low ie L1 bid is less by 10% or more of the Estimated Cost, the contractor shall submit additional Security Deposit in the form of PBG/DD for an amount equal to difference in the estimated cost vis-a-vis final tender amount quoted by the L1 contractor. PBG/DD to be submitted within 7 days from issue of letter from /Bank. 7. If the L1 bidder refuses to give the PBG, then the EMD will be forfeited and the tender will be re-invited. The L1 bidder will not be allowed to participate in the retendering process.
22.		If the final L1 bid is below 7.5% of the estimated cost then the L-1 contractor has to submit Additional Security Deposit (ASD)/Additional Performance Guarantee (APG). The amount of such ASD / APG shall be the difference

		between 92.5 % of estimated cost put to tender and the quoted price. Bank Guarantee or FDR receipt favoring Asst. General Manager (Admin), Internal Audit Dept, Hyderabad, but drawn on any other Nationalized Bank may also be accepted as ASD / APG.
23.	Working Hours	The Contractor has to work in the Premises of an office which is functional and no in convenience to be created for effective functioning of office during office hours and the office staff. The Contractor should execute major works in the Nights and Holidays. The Contractor should make necessary arrangements for this.

Following documents to be scanned and uploaded :-

1. Scanned copy of Tender cost and EMD must be uploaded and the same needs to be submitted at given address within due date of tender
2. Firm should be visit the website (<https://etender.sbi>) till last date of submission for changes. corrigendum if any will be published only in <https://etender.sbi>
3. L-1 Tenderer signed copy of entire tender document should be submit within 3 days from date of tender opening

Assistant General Manager

2. INSTRUCTIONS TO THE TENDERER

1. This tender is for the " **PROPOSED VRF AC WORKS FOR RENOVATION OF DEPARTMENT OF STATE BANK OF INDIA IN GROUND FLOOR, CMP BUILDING, LINGAMPALLY POST, HYDERABAD, TELANGANA-500019.**" It is a Two Bid containing Technical bid and Price Bid.

In their own interest the contractors are advised to use their own specific seals and desist from using currency coins for the purpose. Tenders with incomplete or broken seals are liable to be rejected, the matter solely resting at the discretion of the EMPLOYER / ARCHITECTS. If a Contractor does not quote for one or more items, the Tender will be considered as incomplete and will be rejected.

2. Clients/Architects reserve to itself the right to accept or reject any tender without assigning any reason for doing so and does not bind itself to accept the lowest or any other tender.

3. General Specifications are for guidance only. The latest ISI codes and Specifications and mode of measurements will be referred to during execution.

4. The term "THE ARCHITECTS" in the said conditions shall mean **M/S ABHIKRAM-S Architects, Interior Designers, Urban Planners, Valuers & Project Managers. #3-6-134, Flat No-302, SVC Royal DM Apartments, Street No-18, Himayat Nagar, Hyderabad-500029.**

5. Employer or Client shall mean The Assistant General Manager (Admin), State Bank of India, Internal Audit Department, Admin Wing, Corporate Centre, State Bank Nireekshan Bhavan, Lingampally Post, Hyderabad
Telangana – 500019.

3. FORM OF TENDER

PROJECT: PROPOSED VRF AC WORKS FOR RENOVATION OF DEPARTMENT OF STATE BANK OF INDIA IN GROUND FLOOR, CMP BUILDING, LINGAMPALLY POST, HYDERABAD, TELANGANA-500019.

REF : VRF AC WORKS.

Dear Sirs,

I/We the undersigned have carefully gone through and clearly understood after visiting the site and the Tender drawings and tender documents comprising of the tender form, Notice to contractors, and conditions for building contract, Special Conditions, Specifications and Schedule of Probable quantities and Draft Agreement prepared by your Architects **M/S ABHIKRAM-S Architects, Interior Designers, Urban Planners, Valuers & Project Managers. #3-6-134, Flat No-302, SVC Royal DM Apartments, Street No-18, Himayat Nagar, Hyderabad-500029.**

I/We do hereby undertake to execute and complete the whole or part of the work (as desired by you) at the respective rates which/I/We have quoted for the respective items of the Probable Bill of Quantities and at which rate the items specified amount **to Rs. 29,36,100.00 + CAMC + plus GST**

I/We are depositing as Earnest Money a sum of **RS. 30,000.00/-** in favor of The Assistant General Manager (Admin), Internal Audit Dept, Hyderabad payable at Hyderabad along with this tender for due execution of the work at my/our tendered rates together with any variations which shall be adjusted by the Architects at prices based on our tendered rates. I/We shall deposit further sum equivalent to 2% of tender amount, less EMD paid in the event of my/our tender being accepted, towards initial security deposit.

In the event of this Tender being accepted I/We agree to enter into an agreement as and when required and execute the contract according to your form of Agreement, within 15 days of receipt of work order, in default thereof, I/We do hereby bind my-self/ourselves to forfeit the aforesaid initial security deposit.

I/We further agree to complete the work covered in the said schedule of quantities AS PER NIT from the 15th day reckoned from the date of issue of the work order to commence the work or on which contractor is instructed to take possession of the site, whichever is later.

I/We agree not to employ Sub-contractors other than those that may be specifically approved by your Architects for this contract work.

I/We agree to and to get the work, workers, employees (of contractor, Architect & Employer) engaged on the work at site and all materials at site for execution of the work shall be insured comprehensive insurance including fire / accidents / rain/ floods / riots / CAR policy (contractor's all risk insurance policy) and the insurance shall cover the period from date of start of work to date of actual completion of work plus 3 months. In case part work is taken over by the Employer before final completion of the whole work, such parts may not be covered by the insurance from the date of taking over that part of work by the Employer. Draft Insurance deed will be got vetted by the Architect, before obtaining the same. All the rates quoted by me/ us are inclusive of the same in full and nothing extra shall be claimed anytime on account of any of these.

I/We agree to pay Income tax, to be deducted at source, at the rate prevailing from time to time on the Gross value of the work done, and the rates quoted by me/we are inclusive of same.

Yours faithfully,

Contractor’s Signature

Address:

Date:

4. NOTICE TO CONTRACTOR

ADDRESS:

PROJECT: PROPOSED VRF AC WORKS FOR RENOVATION OF DEPARTMENT OF STATE BANK OF INDIA IN GROUND FLOOR, CMP BUILDING, LINGAMPALLY POST, HYDERABAD, TELANGANA-500019.

REF : VRF AC WORKS.

Dear Sirs,

On behalf of our clients, The Assistant General Manager (Admin), State Bank of India, Internal Audit Department, Admin Wing, Corporate Centre, State Bank Nireekshan Bhavan, Lingampally Post, Hyderabad, Telangana - 500019. we have pleasure in inviting you to tender for the aforesaid work.

1. The scope of work broadly as given below is for Proposed Interiors for **PROPOSED VRF AC WORKS FOR RENOVATION OF DEPARTMENT OF STATE BANK OF INDIA IN GROUND FLOOR, CMP BUILDING, LINGAMPALLY POST, HYDERABAD, TELANGANA-500019.**
2. **Tender Documents should be filled and uploaded on the site of M/S e-procurement Technologies Limited. E-mail: anshul@auctiontiger.net**
3. The tenderer must obtain for himself, on his own responsibility and at his own expenses, all the information which may be necessary for the purpose of filling this tender and for entering into a contract for the execution of the same and must examine the drawings and inspect the site of the work and acquaint himself with all local conditions and matters pertaining thereto.
5. Each of the tender documents page is required to be signed by the person or persons submitting the tender in token of his/their having acquainted himself/themselves with the General conditions etc., as laid down. Any tender with any of the documents not so signed will be rejected.
6. The tender documents must be filled in English and all the entries must be made by hand and written in ink. If any of the documents are missing or un-signed, the tender shall be considered invalid.
7. Each and every one of all erasures and additions/alterations made, while filling the tender, must be attested by initials of the tenderer. Over-writing of figures must be attested by initials of the tenderer. Overwriting of figures is not permitted. Failure to comply with either of these conditions will render the tender void. After submission of the tender no advice or any change in rate or conditions will be entertained. All the rates should be quoted both in figures and words. In-case of any discrepancy in rates quoted in words/figures and the amounts, the rate quoted in words shall be taken as final and binding.

8. The tender shall be valid for a period of 365 days from the date of opening.
- 9 TOTAL SECURITY DEPOSIT: shall comprise of:
 - a. Earnest Money deposit
 - b. Initial Security deposit
 - c. Retention money
- 9.1 The intending tenderer shall deposit with The Assistant General Manager (Admin), Internal Audit Dept, Hyderabad, by Demand Draft a sum of **RS. 30,000.00/-** as the Earnest Money, as a guarantee of good faith, which amount shall be forfeited as liquidated damages, in the event of any evasive/direct refusal or delay in starting the work and or signing the contract. The deposit of the unsuccessful tenderers will be returned, without interest, immediately after a decision is taken regarding the award of the contract. The Earnest money of the successful tenderer will be adjusted towards Security Deposit. A tender not accompanied by Earnest money deposit will not be considered.
- 9.2 **The successful tenderer will have to pay further sum equivalent to 2% of his contract value, as initial Security Deposit (ISD) by means of a D.D./Banker's cheque in favour of The Assistant General Manager (Admin), State Bank of India, Internal Audit Department, Admin Wing, Corporate Centre, State Bank Nireekshan Bhavan, Lingampally Post, Hyderabad Telangana – 500019. Within 14 days from the date of issue of work order to commence work. The EMD and Security deposit thus paid shall be held by the State Bank of India as Security deposit, for due execution and fulfillment of the contract, till the completion of the work and defect liability period in all respects and shall not bear any interest.**
- 9.3 Together with the money paid under clause 11.1 & 11.2 above, further retention of 10% of the value of the work done will be deducted from every running bill, till total retention, including EMD and initial SD paid earlier, comes to 5% of the contract value, and same shall be held by the Bank as Total Security Deposit. On the Architect's certifying the completion of work, 50% of the total security deposit shall be released to the contractor along with the final certificate of payment, and the balance amount will be retained in the manner stated elsewhere for a further period of twelve months after the completion date recorded in completion certificate, issued by the Architects and agreed to by the Bank. Also refer condition 23(ii) .
10. Within one month of the receipt of intimation from the Architects of the acceptance of his/their tender, the successful tenderer shall be bound to sign an agreement, on a stamp paper in accordance with the Draft Agreement and conditions of contract attached herewith, but the work order or the written acceptance of a tender by the Employer will constitute a binding agreement between the Employer and the person tendering whether such formal contract is or not signed by the contractor.
11. All compensation or other sums of money payable by the contractors to the clients, under the terms of this contract, may be deducted from the Security Deposit or from any sum that may be or may become due to the contractor on any account whatsoever, and in the event of the Security deposit being reduced by reasons of any such deductions, the contractor shall within 15 days of being asked to do so make good in cash or cheque, any sum which have been deducted from his security deposit.
12. The rates quoted by the Contractor shall include all eventualities, such as heavy rain, sudden floods, accidents, fire, riots etc., which may cause damage to the executed work or which may

totally wash out the work. Until the completion certificate is issued to the Contractors, neither the Architect nor the clients will be responsible for such damage or wash out of the construction work.

13. Time is the essence of the contract. The work should be completed within stipulated time as per NIT. The date of commencement shall be within ONE WEEK after confirmation.

a) The day two weeks from the date of issue of work order.

Or

b) The day on which the contractor receives the possession of the site which ever is later.

Or

c) The contractor is asked in writing to take over the possession of the site.

The successful contractor will have to give a CPM/PERT chart of various activities of work to be done so that the work gets completed within the stipulated time as per NIT. The chart shall be submitted within 15 days from the date of acceptance of the tender.

14. If the contractor fails to complete the work by the Scheduled date of completion or within any sanctioned extended time, he will have to pay liquidated damages at the rate of ½% of contract amount for each week of delay the work remains incomplete beyond the completion (Original / extended date), subject to maximum of 5% of the contract value (without extra items) as per clause 31 of the General conditions of contract.
15. The quantities contained in the Schedule are only indicative. The work as actually carried out and done will be measured up from time to time, for which payment will be made subject to the terms and conditions of contract.
16. The unit prices shall be deemed to be fixed prices. In case of extra items, a record of labour charges paid shall be maintained and shall be presented every month for extra/substituted items regularly to the Architects for checking. The settlement will be made based on figures arrived at jointly and taking into account unit prices of items of work mentioned in the contract assigned to the successful tenderers. In case, of extra items, where similar or comparable items are quoted in the tender, extra rates shall invariably be based on those tender rates to the extent reasonable.
17. Our clients, **The Assistant General Manager (Admin), State Bank of India, Internal Audit Department, Admin Wing, Corporate Centre, State Bank Nireekshan Bhavan, Lingampally Post, Hyderabad Telangana – 500019**, do not bind themselves to accept the lowest or any tender and reserve to themselves the right to accept or reject any or all tenders, either in whole or in part, without assigning any reason whatsoever for doing so.
18. No employee of the SBI bank is allowed to work as a contractor for a period of two years of his retirement from bank service, without the previous permission of the bank. This contract is liable to be cancelled, if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of the bank as aforesaid before submission of the tender or engagement in the contractor's service.

19. The tenderer, apart from being a competent contractor must associate himself with agencies of the appropriate class who are eligible to tender for (1) INTERIOR (2) Air conditioning works (3) Fire fighting systems & (6) Interiors (fixed furniture), as the case maybe.
20. Release of security deposit:
 - i) 100% of Retention money will also be released as noted under(i) above, subject to submission of a Bank Guarantee, to the satisfaction of SBI for an equivalent amount. This Bank Guarantee shall be valid upto completion of defects/removal liability period plus 3 months.

ARCHITECTS:

**M/S abhikram-s
architects, interior designers, urban planners
valuers & project managers
#3-6-134 FLAT NO 302
SVC ROYAL DM APARTMENTS
STREET NO 18, HIMAYATNAGAR
HYDERABAD-500029
ph.no 040-23261158
abhikramarchitects@gmail.com**

5. ARTICLES OF AGREEMENT

ARTICLES OF AGREEMENT made the _____ day of _____ 2026 between

of _____

(hereinafter called the “Employer”) of the one part and _____
of _____ (hereinafter called “The Contractor”) of the other
part, where as the Employer is desirous of getting the work of
“_____” executed and has
caused drawings, conditions of contract, specifications and schedule of quantities etc., describing the
works prepared by **M/S ABHIKRAM-S Architects, Interior Designers, Urban Planners, Valuers & Project Managers. #3-6-134, Flat No-302, SVC Royal DM Apartments, Street No-18, Himayat Nagar, Hyderabad-500029.**

AND WHEREAS the SAID DRAWINGS numbered as per list attached inclusive of _____ and the conditions of contract, specifications and schedule of quantities etc., have been signed by or on behalf of the parties hereto.

AND WHEREAS THE CONTRACTOR has agreed to execute upon and subject to the conditions set forth in the Schedule hereto (hereinafter referred to as “Said Conditions”) the works shown upon the said drawings and described in the same specifications and included in the said schedule of quantities for such sum as may be ascertained to be payable in terms of the Bills of Quantities, and which sum is estimated to be Rs. _____ (Rupees _____)
(hereinafter referred to as “Said Contract Amount”).

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the said sum to be paid at the times and in the manner set forth in the said conditions, the contractor shall upon and subject to the said conditions, execute and complete the work shown in the said drawings and described in the said specifications.
2. The Employer shall pay the contractor the said sum or such sums as shall become payable hereunder at the times and in the manner specified in the said conditions.
3. The term “Architect” in the said conditions shall mean the said **M/S ABHIKRAM-S Architects, Interior Designers, Urban Planners, Valuers & Project Managers. #3-6-134, Flat No-302, SVC Royal DM Apartments, Street No-18, Himayat Nagar, Hyderabad-500029.** or in the event of their ceasing to be the Architect for the purpose of this contract, such other person as shall be nominated for that purpose by the Employer, not being a person to whom the contractor shall object for reasons considered to be sufficient by the Arbitrator mentioned in the said conditions provided always that no persons subsequently appointed to be the Architect under this contract shall be entitled to disregard or over-rule any previous decision or approval or direction given or expressed by the Architect for the time being.
4. Tender documents containing work order Notice to the Contractor, Conditions of Contract, Appendix thereto, Special Conditions of Contract, Specifications and Schedule of Quantities with the rates entered therein, shall be read and studied as forming part of this agreement and the parties

hereto shall respectively abide by and submit themselves to the conditions and stipulations and perform the agreement on their part respectively in such conditions contained.

5. The contract is neither a fixed lumpsum contract or a piece work contract, but is a contract to carry out work in respect of the entire works to be paid for according to actual measured quantities, including variations from BOQ at the rates contained in the Schedule of rates and Probable bill of quantities or as provided in the said conditions.
6. The Employer through the Architect, reserves to himself the right of altering the drawings and natures of the work, of adding/substitution to or omitting any items of work or having portions of the same carried out through alternate agencies without prejudice to this contract.
7. Time shall be considered a the essence of this agreement and the contractor hereby agrees to commence the work soon after the site is handed over to him but within 15 days reckoned from the date of issue of work order to execute the work, as provided for in the said conditions and complete the entire work **AS PER NIT** subject to nevertheless to the provisions for extension of time.
8. This agreement and contract shall be deemed to have been made in Hyderabad and any questions or dispute rising out of or in any way connected with this Agreement and Contract shall be deemed to have arisen in Hyderabad and only the courts in Hyderabad shall have jurisdiction to determine the same. The limitation period will be 90 days from the date of dispute having arisen.

AS WITNESS our hand this _____ day of _____ 2026

Signed by the said in the presence of:

WITNESS : SIGNATURE

NAME :

ADDRESS :

EMPLOYER

WITNESS : SIGNATURE

NAME :

ADDRESS :

6. GENERAL CONDITIONS OF CONTRACT

1. INTERPRETATIONS:

In constructing these conditions and the specifications, schedule of quantities and contract agreement, the following words shall have the meaning herein assigned to them except where the subject or context otherwise required:

- a. “Employer” shall mean **The Assistant General Manager (Admin), State Bank of India, Internal Audit Department, Admin Wing, Corporate Centre, State Bank Nireekshan Bhavan, Lingampally Post, Hyderabad Telangana – 500019** and shall include his/their heirs, legal representatives, assignees and successors.
- b. “Contractor” shall mean _____
and shall include his/their heirs, legal representatives, assignees and successors.
- c. “Banks Engineer” shall mean any Engineer who is employed by SBI or any other Engineer appointed from time to time by the Employer, and certified in writing to the Architect and the contractor, to act as Engineer for the purpose of the Contract in place of the said engineer.
- d. “Architects” shall mean any Engineer/ representative appointed by **M/S ABHIKRAM-S Architects, Interior Designers, Urban Planners, Valuers & Project Managers. #3-6-134, Flat No-302, SVC Royal DM Apartments, Street No-18, Himayat Nagar, Hyderabad-500029.**
- e. “Works” shall mean the works to be executed in accordance with contract specifications, quantities etc.
- f. “Contract” shall mean the Articles of Agreement, the General Conditions, Special Conditions, the Appendix, the Schedule of Quantities, Specifications and drawings, work order etc., attached hereto and duly signed.
- g. “Contract Price” shall mean the sum named in the Tender, subject to such amount additions thereto or deductions there from as may be made under the provisions, hereinafter contained.
- h. “Site” shall mean the Premises, on which the works are to be, provided, by the Employer or Architect for the purpose of the Contract.
- i. “Drawings” shall mean the drawings referred to in the contract etc., and any modifications of such drawings approved in writing by the Architect and the Bank and such other drawings as may from time to time be furnished or approved in writing by the Architect and Employer.
- j. “Notice in Writing” or written notice shall mean a notice in writing, typed or printed characters sent (unless delivered personally or otherwise provided to have been received) by registered post to the last known private or business address or registered office of the

address and shall be deemed to have been received, when in the ordinary course of post, it would have been delivered.

- k. “Act of Insolvency” shall mean any Act of Insolvency as defined by the Presidency Towns Insolvency Act, or the Provincial Insolvency Act or any act amending such original.
- l. “Net Prices” if in arriving at the Contract Amount, the contractor has added to or deducted from the total of the items of the Tender any sum, either as a percentage or otherwise, then the net price of any items, in the tender, shall be the sum arrived at by adding to or deducting from the actual figure appearing in the Tender, as the price of that item, a similar percentage or proportionate sum. Provided always that in determining the percentage or proportion of the sum so added or deducted by the contractor, the total amount of any Prime cost items and provisional sums of money shall be deducted from the total amount of the Tender. The expression “net rates” or “net prices” when used with reference to the contract or account shall be held to mean rates or prices so arrived at.
- m. “Virtual Completion” shall mean that the building is in the opinion of the Architect and Employer, sufficiently completed for occupation by the Employer, in relation to the scope of work of this contract.
- n. Words importing persons include firms and corporations. Words importing the singular only, also include the plural and vice versa, where the context requires.

2. **SCOPE OF CONTRACT:**

The contractor shall carry out and complete the said work in every respect in accordance with this contract with the directions of and to the satisfaction of the Architect and Employer. Architect, with the approval of the Employer, may issue further drawings and/or written instructions, details, directions and explanations, which are hereafter collectively referred to as “Architect’s Instructions” in regard to:

- a. The variations or modifications of the designs, quality or quantity of works or the addition or omission or substitution of any work.
- b. Any discrepancy in the drawings or between the Schedule of Quantities/ or drawings and/or specifications etc.
- c. The removal and/or re-execution or any works executed by the contractor.
- d. The removal from the site of any material brought there on by the contractor, and the substitution of any other material there from.
- e. The dismissal from the works of any person employed thereupon.
- f. The opening up for inspection of any work covered up.
- g. The amending and making good of any defects under clause 24 “Removal of Improper works and Materials”.

The contractor shall forthwith comply and fully execute any work comprised in such Architect's instruction, provided always that instructions, directions and explanations given to the contractor or his representative upon the works by the Architect shall, if involving a variation, be confirmed in writing by the contractor or within 7 days, and if not dissented from in writing within further 7 days by the Architect, such shall be deemed to be the Architects instructions within the scope of contract.

If compliance with the Architect's instructions as aforesaid involved work and/or expense and/or loss beyond that contemplated by the contract, then unless the same were issued owing to some breach of this contract by the contractors, the employer shall pay to the Contractor on the Architect's certificate, the price of the said work (as an extra to be valued as herein after provided) and/or expense and/or loss.

3. **DRAWINGS AND SPECIFICATIONS:**

The works shall be carried out to the entire satisfaction of the EMPLOYER and the Architect, in accordance with the signed contract document, drawings and specifications and such further drawings and details as may be provided by the Architect, and in accordance with such written instructions, directions and explanations, as may from time to time be given by the Architect and the SBI, whose decision as to the sufficiency and quality of the work and materials shall be final and binding on the contractor. If the work shown on any such further drawings or work that may be necessary to comply with any such instructions, directions or explanations, be in the opinion of the contractor outside the scope of work or reasonably could not be inferred from the contract, he shall before proceeding with such work, give notice in writing to this effect to the Architect and the SBI, and in the event of the Architects and the SBI agreeing to the same in writing, the contractor shall be entitled to an allowance in respect of such extra work as an authorized extra. If the Architect and the contractor fail to agree, as to whether or not there is an extra, then, if the Architect decided that the contractor is to carry out the said work, the contractor shall do so, and the question whether or not there is any extra and if so, the amount thereof, shall failing agreement be settled by Arbitration as hereinafter provided, but such reference shall in no way delay the fulfillment of this contract.

No drawing shall be taken as in itself an order for variation, unless in addition to the Architect's signature, it bears express words stating that it is intended to be such an order or bears a remark "VALID FOR CONSTRUCTION". No claim for payment for extra work shall be allowed, unless the said work shall have been executed under the provisions of clause 8 (Authorities, notices, patents, rights and royalties) or by the authorities, of directions in drawing of the Architect as herein mentioned.

One complete set of the signed drawings and a copy of contract document (specifications and schedule of quantities etc) shall be furnished by the Architect to the contractor. The Architect shall furnish within such time as he may consider reasonable, one copy of any additional drawings, which in his opinion may be necessary for the execution of any part of the work. Such copies shall be kept at the works, and the Architect or his representatives shall, at all reasonable times have access to the same and shall be returned to the Architect by the Contractor, before the issue of the final certificate. The original contract documents shall remain in the custody of employer.

Please refer clause 36 of Special conditions of contract.

4. **SCHEDULE OF QUANTITIES:**

The Schedule of Quantities unless otherwise stated shall be deemed to have been prepared in accordance with the Standard Procedure of the Architects and shall be considered to be approximate and no liability shall attach to the Architect for any error/variations that may be discovered therein.

Please refer Clause 5, 6 and 40 of Special conditions of contract.

5. **SUFFICIENCY OF SCHEDULE OF QUANTITIES:**

The contract shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the prices stated in the schedule of Quantities and/or the Schedule of Rates and Prices, which rates and prices shall cover all things necessary for the proper completion of the works.

Please refer clauses 5, 6 and 39 of Special Conditions of Contract.

6. **ERRORS IN SCHEDULE OF QUANTITIES:**

Should any error appear in the Schedule of Quantities, other than in the Contractor's prices and calculations, it shall be rectified and such rectification shall not vitiate the contract but shall constitute a variation of the contract and be dealt with as an authorised extra or deduction.

7. **CONTRACTOR TO PROVIDE EVERYTHING NECESSARY:**

The contractor shall provide everything necessary for the proper execution of works according to the true intent and meaning of the drawings, specifications and the Schedule of Quantities etc., taken together, whether the same may or may not be particularly shown or described there in, provided the same can be inferred therefrom. The several document forming the contract are to be taken as mutually explanatory to one another; detailed drawings and figured dimensions in preference to scale, and special conditions in preference to General conditions and particular specifications in preference to General specifications.

In case of discrepancy between the Schedule of Quantities, the specifications and/or the drawings, the following order of preference shall be observed:-

- i) Description of Schedule of Quantities.
- ii) Particular specifications and special condition, if any.
- iii) Drawings.
- iv) C.P.W.D. specifications.
- v) Indian Standard specifications of B.I.S.

If there are varying or conflicting provisions made in any document forming part of the contract, the Architect shall be the deciding authority, with regard to the intention of the document and his decision shall be final and binding on the contractor.

Any error in description, quantity or rate in schedule of quantities or any omission therefrom shall not vitiate the contract or release the contractor from the execution of the whole or any part of the

works expressed therein according to drawings and specifications or from any of his obligations under the contract.

The contractor shall make his own arrangements for providing water, for carrying out the work, at his own cost. If water from any source other than Municipal main is to be used for construction, the same shall be tested at the contractor's cost, and a report submitted to the Architect for his approval, before such water is used for the works. Temporary INTERIOR connections shall be obtained by the contractor to facilitate execution and completion of work at their cost and all the charges there of should be borne by them.

The contractor shall supply, fix and maintain at his cost, during the execution of any works, all the necessary scaffolding, staging, hoarding, watching and lighting during nights as well as by day required not only for the proper execution and protection of the said works, but also for the protection of the public and the safety of any adjacent road, streets, cellars, vaults, pavements, walls, houses, buildings and all other erections, matters or things. The Contractor shall take down and remove any or all such scaffolding, staging, etc., as occasion shall require or when ordered or so to do, and shall fully reinstate at his own cost and make good all the matters and things disturbed during the execution of the works to the satisfaction of the Architects.

Please refer clause 7 of Special conditions of contract.

8. **AUTHORITIES, NOTICES, PATENT RIGHTS AND ROYALTIES:**

The contractor shall conform to the provisions of the statutes relating to the works, and to the regulation and by laws of any local authority, and of any water, lighting and other companies or authorities, with whose systems the structures are proposed to be connected; and shall before making any variation from the drawings or specifications, that may be necessitated by so conforming, give to the Architects a written notice, specifying the variations proposed to be made and the reason for making it and apply for instruction thereon. In case, the contractor shall not within ten days receive such instructions, he shall proceed with the work conforming with the provisions, regulations or by laws in question.

The contractor shall bring to the attention of the Architect all notices required by the said acts, regulations or bylaws to be given to any authority, and pay to such authority or to any Public Officer all fees that may be properly chargeable in respect of the works, and lodge the receipts with the Architects.

The contractor shall indemnify the Employer against all claims in respect of patent rights, designs, trademarks or name or other protected rights in respect of any constructional plant, machine, work or material used for or in connection with works or temporary works and from and against all claims, demands, proceedings, damages, costs, charges, and expenses whatsoever in respect thereof or in relation thereto. The Contractor shall defend all actions arising from such claims, unless he has informed the Architects, before any such infringement and received their permission to proceed, and shall himself pay all royalties, licence fees, damages, cost and changes of all and every sort that may be legally incurred in respect thereof.

Please refer clause 23 of special conditions of contract.

9. **MATERIALS AND WORKMANSHIP TO CONFORM DESCRIPTION:**

All materials and workmanship shall, so far as procurable be of the respective kinds specified in the Schedule of Quantities and/or specifications and in accordance with the Architect's instructions and the contractor shall on the request of the Architects furnish to them all invoices, accounts, receipts and the other vouchers to prove that the materials comply therewith. The contractor shall at his own cost arrange for and/or carry any test of any materials, which the Architect & Employer may require. The costs of materials used for testing, packing, transportation and testing shall be borne by the contractor and his quoted rates/amounts shall include all such expenses/contingencies.

- 9a. In case of non-availability of specified Make/brand of any material the alternate make/brand will be given by the Employer/Architect.

10. **THE SETTING OUT:**

The Contractor shall at his own expense, set out the works accurately in accordance with the plans and to the complete satisfaction of the Architect. The Contractor shall be solely responsible for the true and perfect setting out of the same and for the correctness of the positions, levels, dimensions and alignment of all parts thereof. If at any time any error shall appear during the progress or on completion of any part of the work, the contractor shall at his cost rectify such error if called upon to the satisfaction of the Architects/Employer. The work shall from time to time be inspected by the Architect and/or his representatives, but such inspections shall not exonerate the contractor in any way from his obligation to remedy any defects, which may be found to exist at any stage of the work or after the same is completed, at his own cost.

11. **REMOVAL OF ALL OFFENSIVE MATTERS:**

All debris arising out of the work shall be disposed off as per the rules and regulations of the Local authorities concerned.

12. **OPENING UP WORKS:**

In the event of the Architect / Employer feels that the work is not carried out as per tender specifications, contractor at his cost shall open the concealed work at his cost for which no Extra cost will be paid.

12. **CONTRACTOR'S SUPERINTENDENCE & REPRESENTATIVE ON THE WORKS:**

The contractor shall give all necessary personal superintendence during the execution of the works and so long thereafter as the Architect may consider it necessary until the expiration of the "Defects Liability Period" stated in clause 25. The Contractor shall meet the Architect or his representative, whenever required and so informed by the Architect.

The Contractor shall maintain and be represented at site at all times, while the work is in progress, by a responsible and efficient foreman, approved by the Architect and who must thoroughly understand all the trades entailed and be constantly in attendance while the men are at work. Any directions, explanations, instructions or notices given by the Architect & Employer to such foreman shall be deemed to have been given to the contractor and shall be binding as such on the contractor. The Foreman shall be thoroughly conversant with the English language and should be able to read, write and speak English.

13. **DISMISSAL OF WORKMEN:**

The contractor shall on the request of the Architect and Employer immediately dismiss from the works any person employed thereon who may, in the opinion of the Architect and Employer be unsuitable or incompetent or who may misconduct himself, and such person shall not again be employed or allowed on the works without the permission of the Architect & Employer.

14. **ACCESS TO WORKS:**

The Architect, the Employer and any person authorised by them shall at all reasonable times have free access to the works and to the workshops, factories or other places where materials are being prepared or constructed by the contract and also to any place where the materials are lying or from which they are being obtained. The Contractor shall give every facility to the Architect and the Employer and their representatives for inspection and examination and test of the materials and workmanship. No person, unless authorised by the Architect or the Employer, except the representatives of Public authorities, shall be allowed on the works at any time. If any work is to be done at a place other than the site of works, the contractor shall obtain the written permission of the Architect for doing so.

15. **EMPLOYER'S REPRESENTATIVE/PMC:**

The Employer may appoint an assistant to the Engineer, any Site Engineer or Project Management Consultant (PMC), who shall be the representative of the Employer. The duties of the Employer's representatives are to watch and supervise the works and to test any materials to be used and of workmanship employed in connection with the works. He shall have no authority either to relieve the contractor of any of his duties or obligations under the contract, or except those expressly provided hereunder, to order any work involving delay or any extra payment by the Employer or any variation of or in the works.

The contractor shall afford the Employer's representative every facility and assistance for examining the works and materials and checking and measuring item and materials. Neither the Employer's representative nor any assistant to the Architect shall have power to revoke, alter, enlarge or relax the requirements of this contract, or to sanction any new-work, additions, alterations, deviations or omissions unless such an authority may be specially conferred by a written order of the Architect and Employer.

The Employer's representative shall have to give notice to the Contractor or his representing about the non-approval of any work or materials and such works shall be suspended or the use of such materials should be discontinued until the decision of the Architect is obtained. The work will from time to time be examined by the Architect or the Employer's representative, but such examinations shall not in any way exonerate the contractor from the obligation to remedy any defects, which may be found to exist at any stage of the work or after the same is completed. Subject to the limitations of the clause, the contractor shall take instructions only from the Architect and Employer.

16. **ASSIGNMENT OF SUB-LETTING:**

The works included in the contract shall be executed by the contractor and the contractor shall not directly or indirectly transfer, assign or underlet the contract or any part/share thereof or interest

therein without the written consent of the Architect and Employer, and no undertaking shall relieve the contractor from the full and entire responsibility of the contract or from active superintendence of the works during their progress.

17. **SUB-CONTRACTORS:**

All specialists, merchants, tradesmen, and others, executing any work or supply and fixing any goods for which prime cost prices or provisional sums are included in the Schedule of Quantities and/or specifications, who may be nominated or selected by the Architect and employer and hereby declared to be sub-contractors employed by the Contractor, are herein referred to as nominated sub-contractors. No nominated sub-contractors shall be employed on or in connection with the works, against whom the contractor shall make reasonable objection or (see where the Architect and contractor shall otherwise agree), who will not enter into a contract provided.

- a. The nominated sub-contractors shall indemnify the contractor against the same obligations in respect of the sub-contract as the contractor is under, in respect of this contract.
- b. The nominated sub-contractors shall indemnify the contractor against claims in respect of any negligence by the sub-contractor, his servants or agents or any misuse by him or them of any scaffolding or other plant, the property of the contractor or under any Workman's Compensation Act in force.
- c. Payment shall be made by the contractor to the nominated sub-contractor, within 14 days of receipt of the Architect's certificate, provided that before any certificate is issued, the contractor shall upon request furnish to the Architect proof that all nominated sub-contractor's account included in the previous certificates have been duly discharged; in default whereof the Employer may pay the same upon a certificate of the Architect and deduct the amount thereof from any sums due to the contractor. The exercise of this power shall not create any contract between Employer and Sub-contractor.

18. **VARIATIONS NOT TO VITIATE CONTRACT:**

The contractor shall when directed in writing by the Architect, omit from or vary works shown upon the drawings or described in the specifications or included in the priced schedule of quantities, but the contractor shall not make any alterations or additions to or omissions from the works or any deviations from the provisions of the Contract without such authorizations or direction in writing from the Architect and Employer.

No claim for any extra item or deviations shall be allowed, unless it shall have been executed by the Authority of the Architect and Employer as herein mentioned. Any such extra item or deviation is hereinafter referred to as an authorised extra item or deviation. No variations i.e., additions, omissions or substitutions shall vitiate the contract.

The rate of items not included in the bill of quantities shall be settled by the Architect and Employer in accordance with the provisions of clause 21, hereof.

19. **MEASUREMENTS OF WORKS:**

The Architect/PMC may from time to time intimate the Contractor that he requires the works to be measured and the contractor shall forthwith attend or send a qualified agent to assist

PMC/Architect's representative in taking measurements and calculations, and to furnish all particulars or give all assistance required by either of them.

Should the contractor not attend or neglect or omit to send such an agent, then the measurements and calculations, and to furnish all particulars or give all assistance required by either of them.

Should the contractor not attend or neglect or omit to send such an agent, then the measurements taken by the PMC/Architects representative approved by them shall be taken to be the correct measurements. The mode of measurements wherever not mentioned in contract documents be taken in accordance with the Indian Standard of Method of measurements of building works (I.S.1200 – 1958) and its revisions, if any. In case of any discrepancy between various contract documents on mode of measurements, the mode given in Bill of Quantities will take precedence over others.

The contractor or his agent may at the time of measurement take such notes and measurements as he may require.

All authorized extra works, omissions and all variations made without the Architect's knowledge, if substantially sanctioned by him in writing shall be included in such measurements.

22. **PRICES FOR SUBSTITUTIONS/EXTRA ETC., ASCERTAINMENT OF:**

Should it be found after the completion of the works from measurements taken (in accordance with the previous paragraph) that any of the quantities or amounts specified for the works in the priced schedule of quantities of work thus ascertained are less or greater than the amounts and/or tender or that any variations, is made, and any substituted/ extra (new) items have been executed, the valuation of such quantities/items, amounts or variations, unless previously or otherwise agreed upon, shall be made in accordance with the following rules:

- a. The net rates or prices in the original tender shall determine the valuation of the extra (additional quantities and or extra/substituted item of work), where that work is of a similar character and executed under similar conditions of the work priced therein. This applied to extra and substituted items of work to the extent, they are similar in nature to the items in the contract.
- b. The net prices given in the original tender shall determine the value of the items omitted, provided if omissions vary the conditions under which any remaining items of work are carried out, the prices for the same shall be valued under thereof.
- c. Where extra/substituted item of works are not of similar character (either partly & fully) and/or executed under similar conditions as aforesaid or where the omissions vary the conditions under which any remaining items of works are carried out or if the amount of any omission or additions relative to the amount of the whole of the contract works or to be any part thereof shall be such that in the opinion of the Architects the net rate or price contained in the priced schedule of quantities or tender or for any item of the work involves less or more beyond that reasonably contemplated by the Contractor or is by reason of such omission or addition rendered unreasonable for in-applicable, the Architect shall fix in consultation with the Employer such other rates or prices as in the circumstances he shall think reasonable and proper, which shall be final and binding on the contractor. For extra

and substituted items this will apply for portions of the items for which, items of similar nature are not available in the contract.

- d. Where extra and or substituted items of work cannot be properly measured or valued, the contractor shall be allowed based on the net local day work rates and wages for the district and prevalent market rates for materials etc., at the time of ordering that item; provided that in either case vouchers for wages paid specifying the daily time (and if required by the Architect, the workmen's name) and materials employed at or before the end of the week following that in which the work has been executed.

The measurements and valuations in respect of the extra and substituted items of work shall be completed within the "Period of final measurement" or within 3 (three) months from the completion of the contract works as defined under clause No.26 (certificate of virtual completion).

See Special Conditions of Contract Clause 44.

23. **UNFIXED MATERIALS:**

When any materials intended for the works shall have been placed at site by the contractor, such materials shall not be removed therefrom (except for the purposes of being used on the works) without the written authority of the Architect and Employer and when the contractor shall have received payment in respect of any certificate in which the architect shall have stated that he has taken into account the value of such unfixed materials on the works such materials shall become the property of the Employer and the Contractor shall be liable for any loss or damage to any such materials.

24. **REMOVAL OF IMPROPER WORK AND MATERIALS:**

The Architect shall, during the progress of the works, have power to order in writing from time to time the removal from the works, within such reasonable times as may be specified in the order, of any materials which in the opinion of the Architect and Employer are not in accordance with the specifications or the instructions of the Architect and Employer; and the substitution with proper materials and the removal and proper re-execution of any work, which has been executed with materials or workmanship, not in accordance with the contract/drawings and specifications or instructions etc., the contractor shall forthwith carry out such orders at his own cost. In case of default on the part of the contractor to carry out such orders, the Employer shall have the power to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental thereto shall be borne by the Contractor, and shall be recoverable from the contractor by the Employer, or may be deducted by the Architect, from any money due or may become due to the contractor for this work or on any other account.

Instead of this procedure for work not done in accordance with the contract, the Architect and Employer may allow such work to remain, and in that case may make allowance for the difference in value together with such further allowance for damages to the Employer, as in his opinion may be reasonable. This allowance shall be recoverable from the contractor by the Employer, or may be deducted by the Architect, from any money due or may become due to the contractor for this work or on any other accounts. The decision of Architects in these matters shall be final and binding on the contractor.

25. **DEFECTS AFTER COMPLETION:**

Any defect, shrinkage, settlement or other faults which may appear with in the “Defects Liability Period” stated in the Appendix on Page 10 i.e. within 12 months after the virtual completion of the works arising in the opinion of the Architect and the Bank, from materials or workmanship not in accordance with the contract, shall upon the directions and writing of the Architect and Employer and within such reasonable time as shall be specified therein, be rectified and made good by the Contractor at his own cost. In case of default, the Employer may employ any other person to amend and make good such defects, shrinkage, settlements or other faults. All damages, loss and expenses consequent therein or incidental thereto shall be made good and borne by the contractor and such damage, loss and expenses shall be recoverable from him by the employer or may be deducted by the Employer, the damages, loss and expenses from any sums that may be due to the contractor or amount retained under condition 38 (Certificate and payment) and in event of the amount retained being insufficient recover the balance from the amount held against EMD & Security deposit under clause 10.1 & 10.2 on Page 5 or any other amounts due or may become due later.

26. **CERTIFICATE OF VIRTUAL COMPLETION:**

The contractors shall intimate in writing to the Architects, as and when the works are complete in all respects in order to enable the Architect to intimate the Employer to take possession of the same. The works shall not be considered as virtually completed, until the Architect has certified in writing that the same have been “Virtually completed” and accepted by the employed. The defects liability period shall commence, only from the date of such virtual completion certificate.

27. **OTHER PERSONS ENGAGED BY THE EMPLOYER:**

The Employer reserves the right to use the premises and any portions of the site for the execution of any work not included in this contract which he may desire to carry out through other persons, and the contractor is to allow all reasonable facilities for the execution of such work, except by special arrangement with the Employer. Such work shall be carried out in such a manner a not to impede the progress of the works included in the contract, and the contractor shall not be responsible for any damage or delay which may happen to or be occasioned by such work.

28. **INSURANCE IN RESPECT OF DAMAGE TO PERSONS AND PROPERTY:**

The contractor shall be responsible for all injury to persons, animals or things and for all structural and decorative damage to property, which may arise from operation or neglect of himself or any of his or sub-contractor’s employees, whether or any other cause whatever in any way connected with the carrying out of this contract. This clause shall be held to include, interalia any damage to buildings, whether immediately adjacent or otherwise, any damage to roads, caused to the buildings and works forming the subject of this contract by frost or other inclement weather. The contractor shall indemnify the employer and hold him harmless in respect of all and any expenses arising from any such injury or damage to persons or property as aforesaid and also in respect of any claim made in respect of injury or damage under any acts of government or otherwise, and also in respect of any award of compensation or damages consequent upon such claim.

The Contractor shall reinstate all damages of every sort mentioned in this clause, so as to deliver up the whole of the contract works complete and perfect in every respect and so as to make good or otherwise satisfy all claims for damage to the property of third parties.

The contractor shall indemnify the Employer against all claims which may be made against the Employer, by any member of the Public or other party, in respect of anything which may arise in respect of the works or in consequence thereof and shall at his own cost, effect and maintain until one month after the works are taken over by the Employer or three months after the date of completion of the contract with an approved office, a policy of Insurance in the joint names of the Employer and the contractor against such risks and signing of the contract. The contract shall also indemnify the employer against all claims which may be made upon the Employer whether under the Workmen's compensation act or any other statute in force during the currency of this contract or at common law in respect of any employees of the contractor or of any sub-contractor and shall at his own expense effect and maintain until one month beyond the virtual completion of the contract, with an approved office. A policy of Insurance in the joint names of the Employer and the Contractor against such risks and deposit such policy or policies with the Architects from time to time, during the currency of the contract. In default of the contractor insuring as provided above, the Architect on behalf of the Employer may so insure and may deduct the premiums paid from any money due or which may become due to the contractor.

The contractor shall be responsible for anything which may be excluded from the Insurance Policies above referred to and also for all other damages to any property arising out of and incidental to the negligent or defective carrying out of this contract however, such damage shall be caused.

The Contractor shall also indemnify the Employer in respect of any costs, charges or expenses arising out of any claim or proceedings and also in respect of any Award of or compensation of damages arising therefrom.

The Employer with the concurrence of the Architect shall be at liberty and is hereby empowered to deduct the amount of any damages, compensations, costs, charges and expenses arising or occurring from or in respect of any such claims of damages from any sums due or to become due to the contractor.

29. **CONTRACTOR'S ALL RISK POLICY:**

The contractor shall within 14 days from the date of commencement of the work insure the works at his cost and keep them insured until one month after the works are taken over by the Employer or three months after the date of completion whichever is earlier, against loss or damage by fire and usual risks other than fire against which insurers generally provide cover in a CONTRACTOR'S ALL RISK POLICY, with an insurer to be approved the Architects, in the joint names of the Employer and contractor (the name of the former being placed first in the policy), progressively for the full amount of the contract, in three stages, beginning with 1/3 of the contract value, and for any further sum as called upon to do so by the Architect, with the prior written consent of the Employer, the premium of such further sum being allowed to the contractor as an authorised extra. Such policy shall cover the property of the Employer only and Architects and surveyor's fees for assessing the claim and in connection with his services generally in reinstatement and shall not cover any property of the contractor or any subcontractor or employee. The contractor shall deposit the policy and receipts for the premiums paid with the Architects, within twenty one days of the date of commencement of work, unless otherwise instructed, as provided above failing which the employer or the Architect on his behalf may insure and may deduct the premium paid from any

money that may be due or that may become due to the contractor. The contractor shall as soon as the claim under the policy is settled, or the work reinstated by the insurers should they elect to do so, proceed with all due diligence with the completion of the works in the same manner as though the fire or other such risk had not occurred and in all respects under the same conditions of contract.

The contractor in case of rebuilding or reinstatement after fire or other such usual risk shall be entitled to such extension of time for completion as recommended by the Architect.

Please refer Special Conditions of Contract, clauses.

30. **MINIMUM AMOUNT OF THIRD PARTY INSURANCE:**

Such insurance shall be effected with an insurer and in terms approved by the SBI which approval shall not be reasonably withheld and for at least the amount stated below. The contractor shall, whenever required, produce to the Architect/Consultant the policy or policies of insurance cover and receipts for payment of the current premium.

The minimum insurance cover for physical property, injury, and death is Rs. 20.00 lakhs per occurrence with the number of occurrences limited to four. After each occurrence contractor will pay additional premium necessary to make insurance valid for four occurrences always.

31. **COMMENCEMENT AND COMPLETION:**

The contractor shall be allowed admittance to the site on the “Date of Commencement” stated in the Appendix, and he shall thereupon and forthwith begin the works and shall regularly proceed with and complete the same (except such painting or other decorative work as the Architect may desire to delay) on or before the ‘Day of Completion’ started in the Appendix subject nevertheless to the provisions for extension of time hereinafter contained.

Refer clause 9 & 36 of Special Conditions of Contract.

32. **DELAY AND EXTENSION OF TIME:**

If in the opinion of the Architect the works be delayed:

- a. by force majeure, or
- b. by reason of any exceptionally inclement weather, or
- c. by reason of proceedings taken on threatened by or dispute with adjoining or neighbouring owners or public authorities arising otherwise, than through the contractor’s own default, or
- d. by the works or delays of the contractors or tradesmen engaged or nominated by the Employer or Architect and not referred to in the Schedule of Quantities and/or specifications, or
- e. by reason of civil, commotion, local combination of workmen or strike or lock-out affecting any of the buildings/traders, or
- f. by reason of the Architect’s instructions as per clause 2, or

- g. In consequence of the contractor not having in due time, necessary instructions from the Architect, for which he shall have specifically applied in writing ahead of time, giving reasonable time to prepare such instructions.

The Architect shall make a fair and reasonable assessment for extension of time, for completion of the contract works which may be approved by the Employer.

In case of such strike or lock-out, the contractor shall as soon as possible, give written notice thereof to the Architect, but the contractor shall nevertheless constantly use his endeavours to prevent delay and shall do all that may reasonably be required, to the satisfaction of the Architect to proceed with the work.

33. **DAMAGES FOR NON-COMPLETION:**

If the contractor fails to complete the works by the date stated in clause 31 (date of completion) or within any extended time certified under clause 32 (extension of time) and if the Architect shall certify in writing on or before the date of issue of the certificate for the last payment to which the contractor may become entitled hereunder that the works could have been reasonably completed by the said date or within the said extended time, then the contractor shall pay to the Employer or allow the employer to recover from dues to the contractor on any account the sum stated in clause 16 of "Notice to contractors" (Page 6) (liquidated damages and not by way of penalty), subject to a maximum amount of 5% as stated in Appendix of General Conditions of contract (page 10) and as stated in clause 16 of "Notice to contractors" (Page 6) and such damages may be deducted from any money due or which may become due to the contractor.

The deduction of such sums shall not, however, absolve the contractor of his responsibility and obligations to complete the work in its entirety.

Please refer clauses 9 & 36 of special conditions of contract.

34. **FAILURE BY CONTRACTOR TO COMPLY WITH ARCHITECT'S INSTRUCTIONS:**

If the contractor after receipt of written notice from the Architect requiring compliance with such further drawings and/or Architects instruction, fails within seven days to comply with the same, the Architect and Employer may employ and pay other persons to execute any such work whatsoever as may be necessary to give effect thereto and all costs incurred in connection therewith shall be recoverable from the contractors by the employer on a Certificate by the Architect as a debit or may be deducted by him from any money due or which may become due to the contractors.

35. **ARCHITECT'S DELAY IN PROGRESS:**

The Architect may delay the progress of the works in case of rains or otherwise, without vitiating the contract and grant such extension of time with the approval of the Employer for the completion of the contract as he may think proper and sufficient in consequence of such delay, and the contractor shall not make any claim for compensation or damage in relation thereto.

36. **SUSPENSION OF WORKS:**

If the contractor, except on account of any legal restraint upon the employer preventing the continuance of the works, or on account of any of the causes mentioned in the clause "Extension of time" or in the case of certificate being withheld or not paid when due, shall suspend works or in the opinion of the Architects, shall neglect or fail to proceed with due diligence in the performance of his part of the contract or if he shall more than once make default in the respects mentioned in clause 24 (removal of improper work and materials), the Employer through the Architect shall have the power to give notice in writing to the contractor required that the works be provided within a reasonable manner, and with reasonable despatch, such notice shall not be unreasonably given and must signify that it purports to be a notice under the provisions of this clause and must specify the acts or defaults on the part of the contractor upon which it is based. After such notice shall have been given, the contractor shall not be at liberty to remove from the site of works, or from any ground contiguous thereto, the site of works, or from any ground contiguous thereto, any plant or materials belonging to him which shall have been placed thereon for the purpose of work, and the Employer shall have lien upon such plants and materials to subsist from date of such notice being given until the notice shall has been complied with, provided always that such line shall not under any circumstances subsist after the expiration of 30 (thirty) day from the date of such notice given, unless the employer shall have entered upon and taken possession of the works and site, as hereinafter provided.

If the contractor shall fail for seven days after such notice has been given, to proceed with the works as therein prescribed, the Employer may enter upon and take possession of the works and site, and of all such plants, machinery and materials thereon intended to be used for the works, and the Employer shall retain and hold a lien upon all such plants, machinery and materials until the work shall have been completed, under powers hereinafter conferred upon him;

If the Employer shall exercise the above power, he may engage any other person to complete the works and exclude the contractor, his agents and servants from entry upon or access to the same, except that the contractor or any person appointed in writing may have access at all times during the progress of the works to inspect, survey and measure the works. Such written appointments or a copy thereof shall be delivered to the Architects before the person appointed comes on to the works and the Employer shall take such steps as in the opinion of the Architect may be reasonably necessary for completion the works, without undue delay or expenses using for that purpose the plant, machinery and materials above mentioned in so far as they as they are suitable and adopted to such use.

Upon the completion of the works, the Architects shall certify the amount of the expenses properly incurred consequent on and incidental to the default of the contractor as aforesaid and in completion the works by other persons.

Should the amount so certified as the expenses properly incurred be less than amount which should have been due to the contractor upon the completion of the works by him, the difference shall be paid to the contractor by the Employer, should the amount of the former exceed the later, the difference shall be paid by the contractor to the Employer. The Employer shall not be liable to make any further payments or compensations to the contractor for or on accounts of the proper use of the plant for the completion of the works under the provisions herein before mentioned other than such payments as is included in the contract.

After the works shall have been so completed by persons other than the contractor, under the provisions herein before contained, the Architect shall give notice to the contractor to remove his plan and all surplus materials as may not have been used in the completion of the works from the site.

If such plant and materials are not removed within a period of 14 days after the notice shall have been given, the Employer may remove and sell the same, holding the proceeds less the cost of the removal and sale, to the credit of the contractor. The Employer shall not be responsible for any loss sustained by the Contractor from the sale of the plant in the event of the Contractor not removing it after notice.

37. **PRIME COST AND PROVISIONAL SUMS:**

- a. Where “Prime Cost” (P.C.) prices or provisional sums of money are considered for any goods or works in the specifications or Schedule of quantities or deviations hereof, the same are exclusive of any trade discounts, or allowances, discount for cash, or profit which the contractor may require and or carriage and fixing.
- b. All goods or work, for which prime cost prices or provisional sums of money are considered may be selected or ordered from any manufacturer’s or firms, at the discretion of the Architect or the Employer. The Employer reserves to himself the right of paying directly for any such goods or work and the Architect may deduct the said prices or sums from the amount of the contract. Should any goods or works for which prime cost prices or provisional sums are considered or portions of same be not required, such prices or sums, together with the profits allowed for such additional amount as the Contractor may have allowed for carriage and fixing will be deducted in full from the amount of the Contract. Whether the goods be ordered by the Contractor or otherwise, the contractor shall at his own cost fix the same, if called upon to do so, and the contractor shall also receive and sign for such goods and be responsible for their safe custody as and from the date of their delivery upon the works.
- c. In cases in which provisional quantities of items/materials are contained in the contract, the contractor shall provide such materials and or execute such items to such amounts or to greater or lesser amounts as the Architect shall direct in his schedule of quantities.
- d. No prime cost sum or sums (or any portion thereof) shall be included in any certificate for payment to the contractor until the receipted accounts relating to them have been produced by the contractor to the Architect. Such accounts shall show all discounts and any sum or sums in respect of such discounts shall be treated as a trade discount. Provided always, that should the contractor in lieu of producing such receipted accounts, request the Architect in writing to issue a certificate to the Employer for such sum or sums, due either on account or in settlement to a sub-contractor direct, the Architect shall, upon satisfying himself that the sub-contractor is entitled to the same, so issue the certificate and such sum or sums be deducted from the amount of the contractor, at the settlement of accounts and any profit or sum to which the contractor is properly entitled, in respect of such sub-contract, and which is in conformity with the terms of contract as though the amount of such certificates to the sub-contractor has been included in a certificate drawn in favour of the contractor.
- e. If the contractor neither produces the receipt nor gives authority to the Architect to issue a certificate in favour of such sub-contractor direct, the Architect may upon giving the contractor SEVEN DAYS NOTICE in writing of his intentions to do so, issue to the sub-contractor such

certificate direct to the Employer and obtain a receipt from the sub-contractor, which receipt shall be deemed as a discharge for the amount of such certificates, as though given by the contractor. In such event, the contractor shall not be allowed any profit he may have added in the Schedule of Quantities upon such sub-contract.

- f. The exercise of the option before referred to by the Contractor and the issue of certificates, as before described to sub-contractor direct of certificates by the Architect, shall not however, relieve the contractor from any of the liabilities in respect of insufficient, faulty or in completed work of the sub-contractor for which he may be liable under the terms of the contract.

38. **CERTIFICATES AND PAYMENTS:**

The contractor shall be paid by the Employer after due checking and after making necessary correction from time to time, by instalments under Interim Certificates to be issued by the Architect on account of the works executed by the contractor based on the joint measurements taken by the PMC, the Architects representative and the contractors representative when in the opinion of the Architect, work to the approximate value named in the Appendix on Page 10 as “Value of work for Interim Certificates”, (or less at the reasonable discretion of the Architect & Employer) has been executed in accordance with the Contract, subject however, to a retention of the percentage of such value named in the Appendix hereto mentioned as “Retention Percentage for Interim Certificates”, until the total amount retained shall reach the sum named in the appendix as Total Retention Money, after which time the instalments shall be upto the full value of the work subsequently so executed plus such amount as he may consider proper on account of materials delivered upon the site by the contractor for use in the work and available on the date of billing.

And when the works have been virtually completed and the Architect shall have certified in writing that they have been so completed, the contractor shall be paid by the Employer after satisfying himself in accordance with the certificate to be issued by the Architect, the sum of money named in the Appendix as ‘Instalment after Virtual Completion’ being a part of the said Total Retention Money.

The Contractor shall be entitled to the payment of the final balance (balance security deposit/retention money) in accordance with the final certificate to be issued in writing by the Architect at the expiration of the period referred to as ‘The Defects Liquidation Liability period’ in appendix on page 10 hereto, from the date of virtual completion or as soon after the expiration of such period as the work shall have been finally completed and all defects made good according to the true intent and meaning hereof, whichever shall happen, provided always that the issue by the Architect of any Certificate during the progress of the works or after the completion shall not relieve the contractor from his liabilities in cases of fraud, dishonesty or fraudulent concealment relating to the works or materials or any matter dealt within the certificate, and in case of all such defects and insufficiencies in the works or materials, which reasonable examination would have disclosed. No certificate of the Architect shall by itself be conclusive evidence that any works or materials to which it relates are in accordance with the contract.

The Architect shall have power to withhold any Certificate, if the works or any parts thereof are not being carried out to his and employers satisfaction. The Architect may by any certificate make any correction in any previous Certificate, which shall have been issued by him. Payment upon the Architect’s Certificates shall be made within the period named in the Appendix as ‘Period of Honoring of Certificates, after such certificates have been delivered to Employer.

Please refer clause 37 & 46 of Special conditions of agreement.

39. **NOTICES:**

Notices for the Employer, the Architect, or the Contractor may be served personally or by being left at or sent by registered post to the last known place of abode or business of the party to whom the same is to be given or in the case of the contractor by being left on the works. In case of a company or corporation, notices may be served at or sent by registered post to the Registered Offices of the Company or Corporation. Any notice sent by registered post shall be deemed to be served at the time, when in the ordinary course of post it would be delivered.

40. **TERMINATION OF CONTRACT BY THE EMPLOYER:**

If the contractor being an individual or a firm, commit any act of insolvency, or shall be adjudged as Insolvent or being an incorporated Company shall have an order for compulsory winding up made against it or pass an effective resolution for winding up voluntarily or subject to the Supervision of the Court and of the Official Assignee of the Liquidator in such acts of insolvency or winding up, shall be unable within seven days after notice to him requiring him to do so, to show to the reasonable satisfaction of the Architect that he is able to carry out and fulfill the contract, and to give security thereof, if so required by the Architect.

Or if the contractor (whether an individual, firm or incorporated Co.) shall suffer execution to be issued.

Or shall suffer any payment under this contract to be attached by or on behalf of any of the creditors of the contractor.

Or shall assign or sublet this contract without the consent in writing of the Architects/Employer first obtained.

Or shall charge or encumber this Contract or any payments due or which may be due to the Contract thereunder.

Or if the Architect shall certify in writing to the Employer that the contractor,

- a. has abandoned the contract or
- b. has failed to commence the works, or has without any lawful excuse under these conditions suspended the progress of the works for 14 days, after receiving from the Architect written notice to proceed, or
- c. has failed to proceed with the works with such due diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon, or
- d. has failed to remove materials from the site or to pull down and replace work for 7 days after receiving from the Architect written notice that the said materials or work were condemned and rejected by the Architect under these conditions, or
- e. has neglected persistently to observe and perform all or any of the acts, matters or things by this contract to the observed and performed by the Contractors for 7 days after written

notice shall have been given to the contractor requiring the contractor to observe or perform the same, or

- f. has to the detriment of good workmanship or in defiance of the Architect's instructions to the contrary, sublet any part of the contract.

Then and in any of the said cases the Employer with written consent of the Architect, may notwithstanding any previous waiver, after giving 7 days notice in writing to the contractor, determine the contract, but without hereby affecting the powers of the Architect to continue in force as full as if the contract has not been so determined and as if the works subsequently executed has been executed by or on behalf of the contractor.

And further, the Employer under recommendations of the Architect, by his Agents, or servants may enter upon and take possession of the works and all plants, tools, scaffoldings, sheds, machinery, and other equipment and materials also laying upon the premises or the adjoining lands or roads, and use the same as his own property or may employ the same by means of his own servants and workmen in carrying on and completion the works or by employing any other contractors or other persons to complete the works and the contractor shall not in any way interrupt or do not act, matter or thing to prevent or hinder such other contractor or other persons or person employed for completing and finishing or using the materials and plant for the works. When the works shall be completed or soon thereafter as convenient, the Architect shall give a notice in writing to the contractor to remove his surplus materials and plant, and should the contractor fail to do so, within a period of 14 days, after receipt thereof by him, the Employer shall sell the same by publication and shall give credit to the contractor for the amount realised. The Architect shall thereafter ascertain and certify in writing under his hand when (if anything) what shall be due to or payable by the Employer for the value of the said plant and materials so taken possession of by the Employer, and the expense or loss, which the Employer shall have incurred due to the contractor, and the amount which shall be so certified shall thereupon be paid by the Employer to the contractor or by the contractor to the Employer, as the case may be.

41. **TERMINATION OF CONTRACT BY CONTRACTOR:**

If payment of the amount payable by the Employer under certificate of the Architect as provided for hereinafter shall be in arrears and unpaid for 30 (thirty) days after notice in writing requiring payment of the amount, as aforesaid shall have been given by the Contractor to the Employer, or if the Employer obstructs the issue of any such certificates, or if the employer commits any Act of insolvency, or if the Employer (being an incorporated company) shall have an order made against him or pass an effective.

Resolution for winding up, either compulsorily or subject to the supervision of the Court or voluntarily, or if the Official Liquidator or the Employer shall repudiate the contract, or if the Official Liquidator in any such winding up shall be unable within 15 days notice to him requiring him to do so, to the reasonable satisfaction of the contractor that he is not able to carry out and fulfill the contract and to give security for the same (including Earnest money), or if the works be stopped for any payments due, and to become due thereunder and if required under the order of the Architects or the Employer or by an injunction or other order of any court of law, then in any of the said cases, the contractor shall be at liberty to determine the contract by notice in writing to the Employer/Architect, and he shall be entitled to recover from the Employer, payment for all works

executed and for any losses he may sustain, upon any plant or materials supplied or purchased or prepared for the purpose of the contract.

In arriving at the amount of such payment, the net rates contained in the contract shall be followed, or where the same may not apply, valuation shall be made in accordance with clause 22 thereof.

42. Matters to be finally determined by the Architects and the Bank (Called excepted matters) – (refer 43(a) below), which shall be final, conclusive and binding on the following matters:

- a) Instructions
- b) Transactions with local authorities
- c) Proof of quality of materials
- d) Assigning or under letting of the contract,
- e) Certificate as to the causes of delay on the part of the contractor and justifying extension of time or otherwise,
- f) Rectification of defects pointed out during the defects liability period.
- g) Notice to the contractor to the effect that he is not proceeding with due diligence.
- h) Certificate that the contractor has abandoned the contract.
- i) Notice for determination of the contract by the Employer.

43. **ARBITRATION:**

- a. When the contractor is dissatisfied with the decision of the Architect/Employer, the contractor is required to give a notice to the Employer within 30 days of the receipt of such decision, for the appointment of the Arbitrator for the settlement of the outstanding disputes.
- b. The Assistant General Manager, State Bank Of India, Premises and Estate Department, Local Head Office, Bank Street, Koti, HYDERABAD shall be appointed to refer those disputes for adjudication to a sole arbitration.
- c. It is also a term of the contract that if the contractor does not make any demand for Arbitrator in respect of any claims within 90 days of receiving the intimation from the Bank that the final bill is ready for payment, the claims if any received after 90 days period shall be absolutely barred from reference to the Arbitrator.
- d. All disputes or differences of any kind whatsoever, which shall at any time arise between the parties hereto touching or concerning the works or the execution or maintenance thereof this contract, or the rights touching or of this contract, effect thereof, or to the rights or liabilities of the parties arising out of or in relation thereto, whether during progress or after determination, foreclosure or breach of the contract (other than those in respect of which the decision expressed to be final and binding in cases listed out in condition 40 above), Architects shall, after written notice to either party to the contract and to the appointing Authority, who shall be appointed for this purpose by the employer refer those disputes for adjudication to a sole arbitrator, to be appointed as hereinafter provided.
- e. 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 three names of persons, who shall be presently unconnected with the organization for which the work executed.

- f. 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 be appointed as a sole arbitrator to the Appointing Authority, within thirty days of receipt of the names by him. The Appointing Authority shall thereupon without any delay appoint the said person as the sole arbitrator. If the contractor fails to communicate such selection as provided above within the period specified, the Appointing Authority shall make the selection and appoint the selected person as the sole arbitrator.
- g. If the Appointing Authority fails to send to the contractor the panel of three names as aforesaid within the period specified, the contractor shall send to the appointing authority a panel of three names of persons, who 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 the 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 persons from the panel as the sole arbitrator and communicate his name to the Appointing Authority.
- h. If the Arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reasons whatsoever, another sole arbitrator shall be appointed as aforesaid.
- i. The work under the contract, shall however, continue during the arbitration proceedings and no payment due or payable to the contractor shall be withheld on account of such proceedings.
- j. 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 first hearing.
- k. The arbitrator may from time to time, with the consent of the parties, enlarge the time for making and publishing the award.
- l. The Arbitrator shall give a separate award in respect of each dispute or difference referred to him. The Arbitrator shall decide each dispute in accordance with the terms of the contract and give a reasoned award. The venue of arbitration shall be such a place, as may be fixed by the Arbitrator in his sole discretion.

The fees, if any, of the Arbitrator, if required to be paid before the award is made and published, shall 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 any by whom and in what manner such costs or any part thereof shall be paid and may fix or settle the amount of costs to be so paid.

- m. The award of the Arbitrator shall be final and binding on both the parties.
- n. Subject to aforesaid, the provisions of the Arbitration and Conciliation Act, 1996, or any statutory modifications or re-enactments thereof, and the rules made thereunder, and for time being in force, shall apply to the arbitration proceedings under this clause.

7. SPECIAL CONDITIONS OF CONTRACT

1. **INSPECTION OF DRAWINGS:**

Before filling in the tender, the contractor will have to check up all drawings and Schedule of quantities, and will have to get immediate clarifications from the Architect on any point, that he feels is vague or uncertain. No claim/damages or compensation will be entertained on this account.

2. **CONTRACTOR TO VISIT SITE:**

Each tenderer must, before submitting his tender, visit the site of works, so as to ascertain the physical site conditions prices and availability and quality of materials according to specifications before submitting the quotations. No excuse regarding non-availability of any materials or changes in the price will be entertained or extra allowed on that account.

The existing adjacent buildings belonging to Govt/private which are in close proximity of the proposed Interiors, hence the contractor shall cater for all arrangements to carry out the work without causing any disturbance to the occupants by providing screens with bamboo matting or other suitable material approved by Architects/Engineer. The contractor shall ensure that no dust or construction material falls near/around the existing buildings.

3. **EXECUTION OF WORK (PRICES TO INCLUDE):**

- i) The whole of the work as described in the Contract (including the Schedule of Quantities, the specifications and all drawings pertaining thereto) and as advised by the Architect & employer from time to time is to be carried out and completed in all its parts to the entire satisfaction of the Architect & Employer. Any minor details of construction, which may not have been definitely referred to in this contract, but which are usual in sound building, road and all construction practice and essential to the work, are deemed to be included in this contract. Rates quoted in the Tender is inclusive of transportation and other over heads.

The rates quoted in the tender should also include all charges for:

- a)
 - 1. Carrying
 - 2. Hauling
 - 3. Labour
 - 4. Fixing
 - 5. Watering
 - 6. Cleaning
 - 7. Making good and
 - 8. Maintenance etc.
- b) The contractor should arrange timely at his cost for all required.
 - i) Plant, machinery, scaffolding, formwork, ladders, ropes, nails, spikes, shuttering, temporary supports, platforms, tools, all materials etc., required for executing the work, and protecting them from weather and other normal/natural causes.
 - ii) Covering/protecting for the walling and other works, during inclement weather, strikes etc., as and when necessary and or as directed.

- iii) All temporary canvas covers/covering, lights, tarpaulin, barricades, water shoots etc.
 - iv) All stairs and steps, thresholds and any other requisite protection for the works.
 - v) All required temporary weather-proof sheds at such places and in a manner approved by the Architect, for the storage and protection of materials, against the effects of sun and rain.
 - vi) All required temporary fences, lighting/sign-boards etc., guards, approaches and roads as may be necessary for execution of the contract works and for safeguarding the public.
- c) The Architect & Employer will be the sole judge in deciding as to the suitability or otherwise of the tools/formwork/machinery or plant that may be brought to the work site by the contractor for the proper execution of the work.
 - d) The rates quoted by the tenderer in the Schedule of Probable items of work will be deemed to be for the finished work.

5. **SCHEDULE OF QUANTITIES:**

The Schedule of quantities forms part of the contract, but the Employer reserves the right to modify the same or any part thereof as per variation clause stated herein below. The contractor shall not be allowed any compensation or damages for the work which is so omitted or cancelled or added or substituted by the Architect & Employer.

Please refer clause 4 of General Conditions of Contract.

6.a. **QUANTITIES LIABLE TO VARY:**

This clause applies for unlimited variations (+ or -) for items of foundations and those executed below plinth level. For all other items, only in case where + variations of any item exceeds 100% of Quantities of respective items given in the schedule of quantities of the contract, such additional quantities of those items shall be treated as extra items and valued as per clause 45 of special conditions of contract, considering of that rates for these items cannot be derived from the contracted items of work.

The quantities indicated in the bill of quantities are only approximate, and hence may vary on either side (+ or -) for accomplishing the works enunciated under the scope of works, in accordance with designs, drawings and specifications and or instructions of the Architect & Employer. Variations may also occur, consequent upon addition or deletion or substitution of particular items, change of designs or specifications during the course of execution. The contractor, in either case, is bound to carryout the modified quantities upto +100% (plus one hundred percent) variation, without any enhancement in rates and at the same rates as per accepted original tendered rates.

Please refer clause 4, 5 & 6 of General conditions of contract.

b. **FILLING OF TENDERS: Rates of each item to be filled**

7. **ACCESS OF INSPECTION:**

The contractor is to provide at all times, during the progress of the works and the maintenance period, means of access with ladders, gangways etc., and the necessary attendants to move and adopt the same as directed for the inspection or measurement of the work by the Architect and Employer or any other agency employed by the client.

Refer clause 7 of General Conditions of Contract.

8. **DIMENSIONS:**

In all cases figured dimensions are to be accepted in preference to scaled sizes. Large scale details shall take precedence over small scale details/drawings. In case of any discrepancy, the contractor shall ask for a clarification, before proceeding with the work. Accordingly, if any work is executed without prior clarification, it is liable to be rejected and shall not be paid for,

9. **PROGRAMME OF WORKS:**

The contractor on starting the work shall furnish to the Employer and Architect a PERT/CPM programme, for carrying out the work stage by stage in the stipulated time, for the approval of Architects and Employer, and follow strictly the approved time schedule by incorporating changes, if any, so authorised by the Architect and Employer, to ensure the completion of construction work ins stipulated time. A graph or chart on individual item/group of items/trades of work shall be maintained, showing the progress both in terms of quantities and value, week by week. The contractor shall submit to the Employer and Architect a weekly progress report stating the number of skilled and unskilled labourers employed on the work, working hours done, quantity of cement, steel and other major items of materials (quantity and value wise) used and corresponding place, type and quantity of work done during the period.

The contractor must inform the Architects, 10 days in advance of requirement of respective drawings and details by him, from time to time. The contractor shall strictly adhere to the approved programme and arrange for the materials and labour etc., accordingly.

Despite repeated instructions, if the contractor fails to show satisfactory progress of the work, the Employer/Architect may take suitable action as deemed fit, including levying of liquidated damages not exceeding ½% of contract price for delay of every week or part thereof, subject to a limit of total liquidated damages levied under this clause to 5% of contract price without prejudice to any terms and conditions of the contract.

Please refer clause 29 & 30 of General Conditions of contract.

10. **OFFICES, STORES, SHEDS ETC., ON THE SITE:**

- a. The contractor shall provide for all necessary storage on the site, in a specified area for all materials, in such a manner that all such materials, tools etc., shall be duly protected from damages by weather or any other cause. Stores for storage of cement shall have all weather proof floors, walls and roof and have proper locking arrangements and must be secure. All

these must be maintained till the work is completed and so certified by the Architect. Necessary and adequate watch and ward for all such accommodations and stores shall be provided for by the contractor at his cost and same included in the rates/amounts quoted by him. All such stores shall be cleared away and the ground left in good and proper order on completion of this contract unless otherwise expressly mentioned herein.

- b. All materials which are stored on the site such as plywood, false ceiling material etc., shall be stacked in such a manner as to facilitate rapid and easy checking of quantities of such materials and prevent deterioration in quality due to water etc.

11. **WATER AND ELECTRICITY: (Electricity boned by the contractor)**

Contractor shall make his own and adequate arrangements for water required for drinking and construction purposes and also for required electric supply at site for satisfactory execution and completion of the work, at his own cost. The contractor shall get the water used for construction purpose tested periodically as per relevant BIS codes at his cost, and shall get the same approved from Architect and clients before using such water for the work.

12. **PROCUREMENT OF MATERIALS:**

Contractor shall procure all the materials for the work from the open market. Time is the essence of the contract. Acceptance of the completion date by the contractor shall mean that he has taken into consideration the availability of all materials of approved make and quality in sufficient quantities at respective markets/sources, to enable him to complete the entire work in the stipulated period.

Contractor will get samples of all materials approved by the Architect and employer, before placing order/purchase/procurement. They shall conform to relevant B.I.S. codes and or tender specifications as applicable.

For all materials, the contractor shall quote for the best quality of the materials of best make/source or supply and they should be got approved by the architect and employer, before procurement.

In case sufficient quantities of approved quality materials from approved sources are not available in time, contractor may have to procure the same from neighbouring areas even with longer leads, as required and directed, at no extra cost.

Please refer clause 9 of General Conditions of contract.

13. **SANITARY ACCOMMODATION IN SITE:**

The contractor shall provide and maintain at his own cost and expense adequate closet and sanitary accommodation for the use of his workmen and others in accordance with the rules and regulations of the relevant local authorities.

14. **FACILITIES TO OTHER CONTRACTORS:**

The contractor shall give full facilities and co-operation to all other contractors working at site doing plumbing, INTERIOR, civil works etc., as directed by the Architect & Employer and shall arrange his programme of work, so as not to hinder the progress of other works. The decision of

the Architect & Employer, on any point of disputes between the various contractors, shall be final and binding on all parties concerned.

15. **TESTING:**

The contractor shall, as and when directed by the Architect & Employer, arrange to test materials and/or portions of the work at site in any approved laboratory at his own cost, in order to provide their soundness and efficiency. The contractor shall transport all the materials from site to the approved laboratory at his own cost. The contractor shall carryout all the mandatory tests as per list attached at the frequencies stated therein. Even after such tests, any materials brought to site or incorporated in the works are found to be defective or unsound or not as per approved samples, the contractor shall remove the same and re-erect at his own cost and without any additional time/period for the same, with reference to the date fixed for completing the work. In case these tests are not carried out at the frequencies stated, then proportionate costs of materials not so tested, including cost of testing and quantities of items of work executed with such materials, if otherwise accepted for retention in the work, will be deducted from the dues to the contractor. The deductions will be worked out by the Architect/client and shall be final and binding on him.

Tolerance on various material and items of work shall be allowed laid down in the documents below and the order of precedence shall be:

- a) Relevant Indian Standards Specifications.
- b) CPWD norms.
- c) Manufacturer's Specifications.

In absence of above Architect's decision basing on the general practice being following shall be final.

17. **SITE MEETINGS:**

A senior representative of the contractor shall attend weekly meetings at works site; and in additions, meetings as and when arranged by Architect & Employer to discuss the progress of the work and sort out problems, if any, and ensure that the work is completed in the stipulated time.

18. **CUSTODY AND SECURITY OF MATERIALS:**

The contractor shall be responsible for the custody and security of all materials and equipment at site and he will provide full time watchman/watchmen to look after his materials, stores, equipments etc., including cement and steel at site and ensure that at no time unauthorised persons gains any access at works site.

23. **NOTICES:**

The contractor shall give all notices and pay all necessary and relevant fees and shall comply with all Acts and Regulations, for the successful completion of the contract work.

Please refer clause 8 of General Conditions of Contract.

24. **STATUTORY REGULATIONS:**

The whole of the work including sanitation and INTERIOR is to be complied with, as per the requirements and bylaws of the relevant statutory authorities, including Contract Labour (Regulation and Abolition) Act, 1970 of Central Government.

25. **MEASUREMENT TO BE RECORDED BEFORE WORK IS COVERED UP:**

The contractor shall take joint measurements with the Employer's representative (Project Management Consultant or any Engineer identified by the Bank) and Architect's representative before covering up or otherwise placing beyond the reach of measurement any item of work. Should the contractor neglect to do so, the same shall be uncovered at the contractor's expense or in default thereof, no payment or allowance shall be made for such work or the materials with which the same was executed.

Refer clause 20 of General Conditions of Contract.

26. **WORKING AT NIGHT OR ON HOLIDAYS:**

The contractor can carry out major work at night, only with prior permission of the Site Engineer of Employer/Architect and with proper supervision. However, all concrete work will be carried out only during the day light.

WORKS AT NIGHT:

If the contractor is required to do preliminary works at night, in order to complete the work within the Time Schedule, the contractor shall provide and maintain at his own cost necessary and sufficient barricades/lights etc., to enable the work to proceed satisfactorily without danger. Approaches to the site also shall be sufficiently lighted by the contractor.

27. **WORKING ON HOLIDAYS:**

No work shall be done on Sunday or other Bank holidays that may be notified by the Architect & Employer, without the specific sanction in writing of the Architect & employer or his representatives.

28. **ACTION WHERE THERE IS NO SPECIFICATION:**

In case of any item/class of work, for which there is no specification mentioned (either in part or full), the same will be carried out in accordance with the relevant CPWD specifications (only for the specifications missing in the contract) and if not available even there (either in part or full) in, relevant standards of BIS shall be followed (only for the portions of specifications missing in the contract specifications and CPWD specifications). Indian standard specifications, subject to the approval of the Architect & Employer.

29. **REPORTING OF ACCIDENT TO:**

The contractor shall be responsible for the safety of all persons employed by him on the works and shall report serious accidents to any of them, whenever and wherever occurring on the works, to Employer who shall make every arrangement to render all possible assistance. This shall be

without prejudice to the responsibility of the Contractor, under the Insurance clause of the General Conditions. Contractor shall take all the precautions as detailed in the safety code attached separately.

30. **CLEARING THE SITE ON COMPLETION/DETERMINATION OF WORKS:**

The contractor shall clear the site of works as per the instructions of the Architect. The site of works shall be cleared of all men, materials, sheds, huts etc., belonging to the contractor. The site shall be delivered in a clean and neat condition, as required by Architect, within a period one week after the job is completed. In case of failure by the contractor, the Employer, under advice to the Architect, have the right to get the site cleared to his satisfaction at the risk and cost of the contractor.

31. **POSSESSION OF BUILDINGS/WORK COMPLETED:**

The contractor shall hand over to the Employer possession of the completed works in stages, as and when required, and as directed by the Architect & Employer.

The Employer will take over the possession of completed works in stages as directed by the Architect, and defects liability period will commence only from the date of final handing over of all the work accordingly.

Please refer Appendix to General Conditions of contract.

32. **TYPOGRAPHIC, CLERICAL AND OTHER ERRORS:**

The Architects/Employer's clarification regarding partially omitted particulars or typographical, clerical and other errors shall be final and binding on the contractors.

33. **INFORMATION TO BE SUPPLIED BY THE CONTRACTOR:**

The contractor shall furnish to the architect & Employer the following from time to time:

- a. Detailed industrial statistics regarding the labour employed by him, etc., every month (within 5th of succeeding month),
- b. The Power of Attorney, name and signature of his authorised representative, who will be in charge for the execution of work.
- c. The list of technically qualified persons (to be approved by the Architect) employed by him for the execution of the work within 15 days from date of start of work,
- d. The total quantity and quality of materials used for the works, every month within 5th of succeeding month.

Last para of clause 33:

Failure to submit any of these details in time, shall be treated as a breach of the contract and likely to result in,

- i) Levying a fine of Rs.500 for each default for each month, and or
- ii) Withholding payments, otherwise due.
- iii) For the periods for which name of technically qualified persons are not given or for which such persons are not employed, recoveries shall be made at Rs.7,500/- per month for each month of default.

In all these matters the decision of the Architect shall be final and binding.

See clause 41 also.

34. **FORCE MAJEURE :**

Neither party shall be held responsible by the other for breach of any condition of this Agreement, attributable to any “Act of God”, Act of State, Strike, lock-out or control or any other reason, beyond the control of the parties and any breach of clauses arising from such Force Majeure conditions as aforesaid shall not be regarded as breach of the provisions of this Agreement.

35. **ARCHITECT’S DRAWINGS AND INSTRUCTIONS:**

A set of major drawings, along with the contract documents shall be provided to the contractor. If any clarification or further drawings are required by the Contractor during or before the start of construction work, the contractor shall inform the Architects and the SBI sufficiently in advance in writing to provide the same. Working details will be given to the Contractor from time to time, during the progress of work, as and when required. In case, any other drawing/detail is required by the contractor, he will give a minimum of fifteen days notice to the Architect.

Refer clause 2 & 3 of General conditions of contract.

37. **COMPLETION OF WORK AND LIQUIDATED DAMAGES:**

The work shall be completed within the Stipulated time as per NIT, and reckoned as under:
WITHIN ONE WEEK AFTER CONFIRMATION.

- (a) The day two weeks from the date of issue of work order.

or

- (b) The day on which the contractor receives the possession of the site – whichever is later.

or

- (c) The contractor is asked in writing to take over the possession of the site.
Time is the essence of the Contract. The Contractor shall strictly adhere to the programme/chart agreed to. In case the contractor fails to complete the work as mentioned above, the liquidated damages may be imposed at the rate of 0.5% per each week (or part thereof) of delay, subject to a maximum of 5% of contract amount.

Refer clause 30 & 31 of General Conditions of contract.

38. **BILLS OF PAYMENTS:**

The minimum value of work for interim payments will be Rs. 25.00 lakhs, as stated in Appendix. The contractor shall submit interim bills, once a month on the basis of joint measurements recorded at site by the contractor's Employer's and the Architects representatives. The bill will be certified by the Architect within 15 working days from the date of submission of the bill by the contractor, and the Employer will make payment as stated in the Appendix to General Conditions of Contract. All such interim payments shall not be considered as an admission of the due performance of the contract or any part thereof in any respect and shall not preclude the requiring of bad unsound and imperfect or unskilled work to be removed and taken away and reconstructed or re-erected at contractor's cost, all as per Employer and Architect's instruction and directions.

39. **WORKMANSHIP:**

Quality of materials and workmanship shall conform strictly to specifications given/stipulated in the tender/contract, and contractor will ensure that the best quality of work will be done to the satisfaction of the Architect and Employer, with strict control on the materials, workmanship and supervision.

Refer clause 9 of General Conditions of Contract.

40. **SCHEDULE OF QUANTITIES:**

Quantities mentioned in the Schedule of Quantities, included in the contract, are approximate and are subjected to variations as per actual site conditions & requirements and as directed by the Architect & Employer. The work shall be executed and completed accordingly.

Refer clause 4, 5 and 6 of General Conditions of Contract.

41. **SITE SUPERVISION:**

The contractor shall appoint at his own cost competent and adequate number of qualified Engineers at site, for (1a) joint measurements and preparations of bills. (2b) for testing materials at site and outside laboratory. (c) for concreting and reinforcement work. (d) for other general supervision. Their appointment shall be approved by the Architect & Employer. The site engineers shall not be removed from the site without the written consent of the Architect & Employer.

See clause 33 above also.

42. **ENGAGEMENT OF APPRENTICES:**

The Contractor shall during the currency of the contract, when called upon by the clients, engage and also ensure engagement by sub-contractors and others employed by the contractor in connection with the works such number of apprentices in the categories mentioned in the act and for such period as may be required by the clients. The contractor shall train them as required under the Apprentice Act 1961 and the Rules made thereunder and shall be responsible for all obligations of the clients under the said Act, including the liability to make payment of apprentices, as required under the said Act.

43. **RATES:**

Contractor shall quote all the rates both in figures and in words and any alterations shall have to be initialled by the contractor. Rates quoted by the contractor for the same item in different schedules shall be same, and in case different rates are quoted, the lowest will be taken as correct and the schedule corrected accordingly. In case of discrepancy between rates given in words and figures or in the amount worked out, the following procedure will be followed:

In case of item rate tender:

The tenderers shall quote their rates for individual items both in words and figures in case of discrepancy between the rates quoted in words and figures the unit rate quoted in words will prevail. If no rate is quoted for a particular item the contractor shall not be paid for that item when it is executed.

The amount of each item shall be calculated and the requisite total is given. In case of discrepancy between the unit rate and the total amount calculated from multiplication of unit rate and the quantity the unit rate quoted will govern and the amount will be corrected.

The tenderers should not change the units as specified in the tender. If any unit is changed the tenders would be evaluated as per the original unit and the contractor would be paid accordingly.

The tenderer should not change or modify or delete the description of the item. If any discrepancy is observed he should immediately bring to the knowledge of the Architect / SBI.

44. **INCOME TAX:**

Income tax shall be deducted at source by the client from the contractor's interim and final bill payments as required by law.

45. **EXTRA/SUBSTITUTED ITEM RATES:**

Such items shall be executed as per directions/instructions of the Architects of the employer.

The work on extra/substituted items shall be started only after the receipt of written order from the client/Architect. Rates for additional/extra or substituted (altered) items of work, which are not covered in the contract cannot be derived from the contract item rates either in full or partly, shall be calculated on the basis of actual costs plus 15% for overhead and profit etc., only to the extent not derivable from the contract item rates.

See clause 21 of General Conditions of Contract.

46. **SERVICES DRAWINGS/SHOP DRAWINGS/CATALOGUE:**

After getting approval from the Architect & Employer, the contractor shall submit to the concerned local authorities necessary services drawings showing layouts etc., for getting approval of the schemes. On completion, the contractor shall arrange to get Drainage Completion Certificate and other Certificate necessary for obtaining Building Completion certificate. The contractor shall

furnish completion drawings of all services in triplicate, showing the work as actual executed, along with levels. Contractor shall submit for approval 4 copies of shop drawings/ catalogue/ equipment characteristics/ manufacturer's specifications, drawings etc., as and when required and directed by the Architect & Employer. Costs of all these are deemed to have been included in the respective item rates quoted by the contractor and nothing extra shall be paid on account of any of these requirement/acts.

47. **PAYMENT:**

No payment whatsoever shall be made by the Employer, if the Contractor abandons the work, due to any site difficulties etc.,

See clause 36 & 37 of General conditions of contract.

48. **PERMISSION:**

The contractor shall also obtain necessary permission approvals from the relevant authorities shall be obtained by the contractor at no extra cost.

49. **MAINTAINING REGISTERS AT SITE:**

The contractor shall maintain registers for consumption of various specials, testing of materials etc., in the proforma which shall be given by the Architect & Employer from time to time.

50. **AGREEMENT:**

The successful contractor shall be required to enter into an agreement in accordance with the Draft Agreement and Schedule of Conditions etc., within 15 days from the date the contractor is advised by the Architect & Employer that his tender has been accepted. The contractor shall pay for all stamps and legal expenses incidental thereto. However, the written acceptance of the tender by the Employer, will constitute as a binding contract between the Employer and contractor, whose tender has been accepted, whether such formal agreement is or is not subsequently executed.

51. **INSURANCE:**

The contractor shall provide insurance in respect of damage to persons and property and firm insurance as per clause 27 and 28 of General conditions of contract. In addition he will also insure against riots and civil commotion. The insurance shall also cover third party and all the persons working at site and visitors including contractor's, worker's, Architect's and clients people, other contractor's workers etc. The contractor shall indemnify the Employer against any claim or compensation or mishaps of whatsoever nature at site during the progress of work.

The contractor shall prove to the Architect/Client from time to time that he has taken out all the insurance policies as required and directed and has paid the necessary premium for keeping the policies valid as per clause 27 & 28 of the General Conditions of Contract.

In case of failure by the Contractor or sub-contractor to effect and keep in force the insurance policies, then the client, without being bound to, may pay such premiums as may be necessary and deduct the same from any money due or which may become due to the contractor or recover the same as a debt due from the contractor.

52. **INDEBTEDNESS AND LIENS:**

The contractor agrees to furnish the Employer from time to time, during the progress of the work as requested, verified statement showing the contractor's total outstanding indebtedness in connection with the work covered by the contract. Before final payment is made, the Employer may require the contractor to furnish the Employer with satisfactory proof that there are no outstanding debts or liens in connection with the contract. If during the progress of the work, the contractor shall allow any indebtedness to accrue to sub-contractor or other and shall fail to pay or discharge same within five (5) days after demand, then the Employer may withhold any money due to the contractor until such indebtedness is paid, or apply the same towards the discharge thereof.

53. **WORK PERFORMED AT CONTRACTOR'S RISK:**

The contractor shall take all precautions necessary and shall be responsible for the safety of the work and shall maintain all lights, guards, signs, barricades, temporary passages or other protection necessary for the purpose. All work shall be done at the contractor's risk and if any loss or damage shall result from fire or from any other cause, the contractor shall promptly repair or replace such loss or damage free from all expenses to the Employer. The Contractor shall be responsible for any loss or damage to materials, tools or other articles used or held for use in connection with the work. The work shall be carried on to Employer or of others and without interference with the operation of existing machinery or equipment, if any.

54. **PHOTOGRAPHS:**

The contractor at his own cost shall take photographs of site and individual buildings during the progress of the work as directed by the Architect/Client and submit two copies of each photograph with minimum size 20 cm x 15 cm to the client/Architect.

55. **INSPECTION BY THE CHIEF TECHNICAL EXAMINERS (VIGILANCE):**

The proposed work covered under this tender, during the progress and/ or after completion, can also be inspected by the Chief Technical Examiner/ Technical Examiner or Officers of the Central Vigilance Commission, Government of India, on behalf of Architect & Employer to ascertain that the execution of the work has been done with materials and workmanship all as stipulated in the contract and as directed.

Contractor shall afford all reasonable facilities to the above vigilance staff and also provide them with ladders, tapes, plum bob, level etc., as required and directed and also necessary labourers skilled/unskilled to enable them to complete their inspection/study/technical scrutiny and no extra shall be admissible to the contractor on this account.

56. **SPECIAL CONDITIONS OF CONTRACT:**

In the event of any discrepancy with clauses mentioned anywhere else in the tender with the clauses mentioned within special conditions of contract, the clauses mentioned within the special conditions of contract shall supersede there mentioned elsewhere.

57. **BIS CODES**

It is compulsory for the contractor to keep all the B.I.S. codes mentioned in this tender document at his cost at the site to ensure the proper supervision/quality of work and materials.

58. **AS BUILT DRAWINGS**

The contractor shall prepare and submit a set of as-built drawings, duly certified by the Architect. The set consists of 2 soft copies and 3 sets of hard copies.

TECHNICAL SPECIFICATIONS

CHAPTER-1 ELECTRICAL WORK

1.0 SCOPE

The scope of work covers the requirements for the electrical works associated with air conditioning applications, namely, switch boards (MCCs), power cabling, control wiring, earthing, and remote control-cum-indicating panels. Electric motors are not covered here, as these are covered as part of the respective equipment specifications.

GENERAL

Unless otherwise specified in the tender specifications, all equipments and materials for electrical works shall be suitable for continuous operations on 415 V / 240 V $\pm$ 10% (3 phase / single phase), 50 Hz. AC system. Where the use of high voltage equipments is specified in particular works, all the respective equipments shall be suitable for continuous operation on such specified high voltage.

All electrical works shall be carried out complying with the Indian Electricity Rules, 1956 as amended to date.

All parts of electrical works shall be carried out as per appropriate CPWD General Specifications for Electrical work, namely, Part I (Internal) 2005 and National Building Code 2005 all as amended to date.

All materials and components used shall conform to the relevant IS specifications amended to date.

1.2 SWITCH BOARDS / MOTOR CONTROL CENTRE

The main switch board in the Each AHU room shall be floor mounted, free standing cubical type and shall be factory built fabricated by one of the reputed switch board manufacturer. It shall be suitable for termination of the incoming cable(s)/ bus trunking from top/ bottom as per site conditions. The switchboards in air handling unit (AHU) rooms shall be wall mounted, or floor mounted as feasible at site and as approved by the Engineer- in – Charge, but they shall be cubical designed, unless otherwise specified and from open able from front.

The capacity of switch gear, starters etc. shall be suitable for the requirements of loads fed/controlled. Starting currents shall be duly considered in case of motor loads.

MPCB shall be used up to and including 63 A for motor applications and MCCB shall be used for other loads. ACB shall be used for 630 A and above ratings.

All MCCBs / MPCBs shall be of AC 23 duty as per IS: 4064-1978 as amended up to date.

Switch boards controlling motors shall house starters for motors, unless otherwise specified. The starter shall be located adjacent to the controlling switch gear.

vi) One-volt meter with selector switch, a set of indicating lamps and fuses for voltmeter and lamps shall be provided at each switchboard. One ammeter with CTS, and selector switch shall be provided with each motor starter. Instruments shall be flush mounted with the panel and have a glass index not higher than 1.5. The instruments and accessories shall be provided whether or not specifically indicated in the tender specifications.

vii) The fabrication of switchboard shall be taken up only after the drawings for the fabrication of the same are approved by the Engineer-in-Charge.

viii) Switchboards shall be fabricated as per specifications indicated in sub-para above.

ix) The layout of bus bars and cable alleys shall be designed for convenient connections and inter-connections with the various switchgear. Connections from individual compartments to cable alleys shall

be such as not to shut down healthy circuits in the event of maintenance work becoming necessary on a defective circuit.

x) Care shall be taken to provide adequate clearances between phase bus bars as well as between phase bus bars, neutral and earth.

Where terminations are done on the bus bars by drilling holes therein, extra cross section shall be provided for the bus bars. Alternatively, terminators. Cables connected to the upper tiers shall be duly clamped within the switchboard.

Provision shall be made for proper termination of cables at the switchboards such that there is no strain either on the cables, or on the terminators. Cables connected to the upper tiers shall be duly clamped with the help of PVC cable ties within the switchboard.

Identification labels shall be provided against each switchgear and starter compartment, using plastic engraved labels.

Metallic danger conforming to relevant IS shall be fixed on each electrical switchboard / MCC.

1.3 POWER CABLING

i) Unless otherwise specified, the power cables shall be XLPE insulated, PVC outer sheathed aluminium / copper conductor, armoured cables rated for 1100 V grade as per IS: 1554 (Part 1) - 1988. The power cables shall be of 2 core for single phase, 4 core for sizes up to and including 25 sq.mm, 3-1/2 core for sizes higher than 25 sq.mm for 3 phase. Where high voltage equipments are to be fed, the cables shall be rated for continuous operation at the voltages to suit the same.

ii) Power cables shall be of sizes as indicated in the tender specifications. In all other cases, the sizes shall be as approved by the Engineer-in-Charge, after taking into consideration the load, the length of cabling and the type of load.

iii) Cables shall be laid in suitable metallic trays suspended from ceiling, or mounted on walls, or laid directly in ground or clamped on structures, as may be required. Cable ducts shall not be provided in plant rooms. Cable trays shall be sheet steel with adequate structural strength and rigidity type, designed with adequate dimensions for proper heat dissipation and also access to the cables with necessary supports and suspenders shall be provided by the Air-conditioning contractor as required.

Cable laying work shall be carried out in accordance with 15.3(iii) above. The scope of work for the Air-conditioning contractor shall include making trenches in ground and refilling as required, but excludes any masonry trenches for the cable work.

CONTROL WIRING

i) Control wiring in the plant rooms and AHU rooms shall be done using ISI marked PVC insulated and PVC sheathed, 1.5 sq.mm copper conductor, 250V grade, cables drawn in ISI marked steel or PVC conduits. Alternatively, armoured multi-core copper conductor cables may also be used for the purpose. The control cables interconnecting the plant room and the AHU rooms shall be of multi-core armoured type only, and suitable for laying direct in ground.

ii) The number and size of the control cables shall be such as to suit the control system design adopted by the Air-conditioning contractor.

iii) ISI marked steel conduits pipes, wherever used, shall be of gauge not less than 1.6 mm thick for conduits upto 32 mm dia and not less than 2.0mm thick of higher sizes. All conduit accessories shall be threaded type with substantial wall thickness.

Control cables shall be of adequate cross section to restrict the voltage drop.

In the case of control wires drawn through steel conduits, the wire drawing capacity of conduits as specified under the CPWD general specifications for Electrical Works (Part I) 2005 shall not be exceeded.

Runs of control wires within the switchboard shall be neatly bunched and suitably supported/clamped.

Means shall be provided for easy identification of the control wires.

Control wiring shall correspond to the circuitry/sequence of operations and interlocks approved by Engineer-in –Charge.

EARTHING

- i) Provision of earth electrodes and the type of earthing shall be as specified in the tender specifications.
 - ii) The earth work shall be carried out in conformity with CPWD Specifications for Electrical works (Part-I), Internal 2005 / NBC 2005.
 - iii) Metallic body of all medium voltage equipments and switch boards shall be connected by separate and distinct earth conductors to the earth stations of the installations; looping of such body earth conductors is acceptable from one equipment, or switch board to another.
 - iv) G.I. plate earthing shall be provided for PTAC plants and reciprocating central AC plants upto 100 TR capacity. Above 100 TR reciprocating units, copper plate earthing shall be provided.
 - v) The size of earth conductors for body earthing of equipments shall be as under:-

Motor upto and including 10 HP rating	2Nos.3mm dia copper wire / 2 nos. 4mm dia GI wire
12.5 HP to 40 HP	2Nos.4mm dia copper wire / 2 nos. 6mm dia GI wire
50HP to 75 HP	2Nos.6mm dia copper wire / 2 nos. 25x3mm GI strip
Above 75 HP	2Nos.25mm x 3mm copper strip / 2 nos. 25x6mm GI strip

Switch boards with incoming rating upto

100 A	2Nos.3mm dia copper wire / 2	nos. 4mm dia GI wire
125 A to 200 A rating	2Nos.6mm dia copper wire / 2 nos. 25x3mm GI strip	
Above 200 A rating	2Nos.25mm x 3mm copper strip / 2 nos. 25x6mm GI strip	
- Armouring of cables shall be connected to the body of the equipments/switch board at both the ends.
Compression type glands shall be used for all such terminations in the case of PVC cables.

MOTOR STARTER

- i) The motor starter shall conform to IS: 1822 “Motor starters of voltage not exceeding 1000 volts” and shall be air insulated and suitable for 415 volts, $\pm 10\%$, 50 Hz, 3 phase AC supply. Enclosures shall have protection of IP 52 for Indoor applications and IP 55 for outdoor applications.
- ii) Starter for the motor shall be direct on line (D.O.L) for motors up to and including 7.5 H.P. rating and automatic star-delta close transition type for motors of higher ratings unless otherwise specified in the tender specifications. Starters shall be rated for intermittent duty. Starting current should not exceed two times the full load current.
The starter shall be mounted on the main electrical control panel/ unit mounted / self mounted as specified.

Each starter shall be provided with the following protections:-
Thermal overload on all the three phases with adjustable settings,
Under voltage protection, and
Independent single phasing preventor. (current sensing type)

Adequate number of extra NO / NC contacts for interlocks, indicating lamps etc. shall be provided on the starter / contractor.

1.7 PAINTING

All panels shall be supplied with the manufacturer’s standard powder coating .

CHAPTER- 2.0 INSPECTION, TESTING AND COMMISSIONING

2.0 SCOPE

This chapter covers the initial inspection and testing of condenser, AHUs at manufacture's works, initial inspection of other equipments/ materials on receipt at site, final inspection testing & commissioning of all equipment at site & description of testing requirements & procedure.

2.1 INITIAL INSPECTION AT MANUFACTURE'S WORKS

Compressor

- i) Salient features such as model, No. of cylinders, capacity control, provision of crank case heaters, type of lubrication etc. shall be verified against the requirements visually without opening the compressors.
- ii) Manufacturer's internal test certificates shall be scrutinized to check compliance with the requirements as specified in the order.
- iii) Rate of leak test shall be checked by developing 7 Kg/sq.cm (gauge) pressure on HP side and 1 Kg/sq.cm on LP side using dry Nitrogen air or carbon dioxide. The leakage through the valves, shaft seal, cylinder heat gasket etc should not be more than 0.3 Kg/sq.cm per cylinder in 4 minutes time. Alternatively this may be demonstrated through vacuum.
- iv) Pneumatic pressure test shall be carried out at 22 Kg/ sq.cm and by submerging the compressor in water for 1 hour & there shall be no leakage.
- v) Free running test shall be carried out at the rated speed specified in contract. This test shall be carried out for 30 minutes in open space. During this running test following operations are to be noted:

Manual loading / unloading of capacity control

Lubrication oil pressure

Safety valve operation

Vacuum test for the compressor for 0.5mmHg..

Condensers

- i) Salient features like number of tubes, inside diameter of tubes (from which the gauge of the tube can be verified), no. of passes, material of fins, length of condenser, provision of fittings like safety valve, water, gas connection shall be verified during stage inspection. The tube thickness shall be checked.
 - ii) Manufacturer's internal test certificates shall be furnished and it shall be verified against contract requirements.
- Pneumatic pressure test at twice the normal condensing pressure for gas side of condenser shall be carried out.

Air Handling Units:

- i) Salient features such as model, size, physical dimensions, and other details of various sections, fan motor details, fan dia, static pressure etc. shall be verified against the contract requirements.
- ii) Manufacturer's internal test certificates for the motor and air handling unit shall be furnished and scrutinized as per contract requirements.

- iii) Test certificate for static and dynamic balancing of the fan/ blower should be furnished. Fan balancing may be witnessed by Engineer-in-Charge or his authorized representative.
- iv) Salient features like, type, material, no. and gauge of fins and tubes and no. of rows of cooling coil shall be furnished and verified with reference to contract requirements during stage inspection.
- v) Hydraulic pressure to the extent of 10 Kgf/sq.cm or pneumatic pressure of 21 Kgf/ sq.cm shall be applied to cooling coil and this pressure should be maintained for 1 hour and no drop should be observed indicating any leaks.

2.4 INITIAL INSPECTION AT SITE

Ducting

- i) The sheet used for ducting shall be checked for physical test at site. The physical test should include the sheet thickness and bend test as per relevant IS specifications.
- ii) Zinc coating of GSS sheet as mentioned in the tender documents may be got tested from a laboratory to verify that same meets the contract requirements.

Switch Gear, Control Gear, and Measuring Instruments

These should be of specified make. For air circuit breaker manufacturer's test certificate shall be furnished by contractor and the same shall be verified as per contract requirements.

Electric Motors

Electric motors should be of specified make, manufacturer's test certificate for electric motor shall be furnished.

Insulation and acoustic lining

- i) Physical verification for thickness and make should be made as per contract before application of insulation.
 - ii) Manufacturer's test certificate for density should be furnished.
- Note: Accuracy of testing instruments shall be as mentioned in the final inspection procedure.

FINAL INSPECTION

- i) After completion of the entire installation as per specification in all respects, the AC contractor shall demonstrate trouble free running of the AC equipments and installation for a period of minimum 120 hours of running as detailed under following points:
After the installation work has been completed by the contractor, he will conduct tests and make adjustments as may be necessary to satisfy himself that the plant including low side equipments is capable of continuous running. There after he will offer to the department a running-in period of 7 days subject to a minimum aggregate of 120 hrs at his cost. The duty cycle of the plant during this running in period shall be same as that specified in the tender documents. In case of multiple compressor installations, all the compressors should be run by rotation. The plant will be operated and a log of all parameters will be maintained during this period. The contractor will be free to carry out necessary adjustments etc during this period without stopping the plant. Record of inside conditions will be made during this period to check the same are as per NIT requirements. The plant will be said to have successfully completed the running-in-period, if no break down or abnormal/ unsatisfactory operation of any machinery occurs during this period.

After this the plant will be made available for beneficial use. After the plant has operated without any major break down/ trouble and inside conditions are maintained as per NIT requirements for the above specified running in period, it shall be taken over by the department subject to guarantee clause mentioned else where in the tender. This date of taking over of plant after trouble free operation during the running in period shall be the date of acceptance.

TESING REQUIREMENTS AND PROCEDURES

Balancing of all air systems and all tests as called for in the specification shall be carried out by the HVAC contractor in accordance with the specifications and relevant local codes if any. Performance tests of individual equipment and control shall be carried out as per manufacturer's recommendation.

All tests and balancing shall be carried out in the presence of Engineer-in-Charge or his Authorized representative.

The whole system balancing shall be tested with microprocessor based hi-tech instruments with an accuracy $\pm 0.5\%$.

The instrument shall be capable of storing data and then down loading into a P.C. The HVAC contractor shall provide a minimum but not limited to the following instruments:

- Microprocessor based calculation meter to measure DB and WB temperature, RH and Dew Point
- Velo meter to measure air volume and air velocity
- Pitot tube
- Electronic rotary vane Anemometer
- Accubalance flow measuring hood

The contractor shall be responsible to provide necessary sockets and connections for fixing of the testing instruments, probes etc.

Air Systems

Systems are to be balanced by first adjusting the total flow at the fan, then by adjusting main dampers and branch dampers. Only final minor adjustments are to be made with register and diffuser dampers.

Balancing of the air system shall be accomplished without causing objectionable air noise. Baffles and orifice plates required for proper air balance shall be furnished and installed by the contractor. Basically the following tests and adjustments are required.

- i) Test all fan systems to provide proper cfm/ cmh.
- ii) Adjust fresh air, return air and exhaust dampers to provide proper air quantities in all modes of control.
- iii) Test and record fresh air, return air and mixed air temperature at all air handling units. Test and record data at all coil after air and hydronic systems are balanced. Measure wet and dry bulb temperature on cooling coils.
- iv) Make point tube transverse at all main supply and return ducts to set proper air quantities. Adjust all zone and branch dampers to proper cfm /cmh.

Test and adjust each register, grills, diffusers or other terminals equipments to within 5% of design air quantity. Each opening shall be defined on the test report by size, manufacturer's model, room location, design cfm and actual cfm. Outlets shall be adjusted to minimize objectionable drafts.

Test and record static pressure drop across all filters and major coils.

High velocity duct systems shall be tested for leakages. If excessive or audible leakage is detected, the defect shall be repaid by the contractor. Sufficient static pressure readings shall be taken from the air handling units to the terminal units to establish system static pressure.

Balancing Tolerance

System shall be balanced with in the following tolerance:

1. Duct leakage rates (at operating pressures)

Low pressure ducts (0 to 0.5 Kpa)	5% of full flow
Medium pressure ducts (0.5 to 3 Kpa)	1% of full flow
High pressure ducts (greater than 3 Kpa)	1% of full flow
2. Air flow rates	
Under 70 L/S	10% of flow
Over /at 70 L/S	5% of flow
3. Water flow rates	
Chilled Water	2% of flow
Other	5% of flow
4. Heat flow rates	
Heat exchangers	5% of design capacity

Procedure:

Review all pertinent plants, specifications, shop drawings and other documentation to become fully familiar with the systems and their specified and intended performance.

Furnish equipment and instruct sheet metal trade on proper use for conducting duct leakage tests. Conduct first test as a way of instructing the above trades in the presence of the Department's representative.

Test performance and continuously record on a 24 hour basis, temperature and humidity levels where control equipment is provided for that purpose in certain critical areas. Before commissioning of the equipment, the entire electrical installation shall be tested in accordance with relevant BIS codes and test report shall be furnished by a qualified and authorized person.

Reports

Provide 3 copies of the complete balancing and testing reports to the department. Report shall be neatly typed and bound suitable for a permanent record. Report forms shall contain complete test data and equipment data as specified and safety measures provided as follows :

i) Safety measures

All equipments shall incorporate suitable safety provisions to ensure safety of the operating personnel at all times. The initial and final inspection reports shall bring out explicitly the safety provisions incorporated in each equipment.

Final documentation

The contractor shall leave the system operation in complete balance with water and air quantities as shown on drawings. Set stops on all balancing valves and lock all damper quadrants in proper position. Secure all

automatic damper and valve linkages in proper positions to provide correct operating ranges. Proper damper positions shall be marked on ducts with permanent indication. Notify the department of any areas marginal or unacceptable system performance.

The above tests and procedures are mentioned herein, for general guidance and information only, but not by way of limitation to the provisions of conditions of contract and design/ performance criteria.

Upon commissioning and final handover of the installation, the HVAC contractor shall submit (within 4 weeks) to the Engineer-in-Charge/ department 6 (six) portfolios of the following indexed and bound together in hard cover ring binder (300 x 450 mm) in addition to the completion drawings as follows:

Completion Drawings

Three sets of following laminated drawings shall be submitted by the contractor while handing over the installation to the Department. Out of this one of the sets shall be laminated on a hard base for display in the AC plant room. In addition one set will be given on compact disc.

- a) Plant installation drawings giving complete details of all the equipments, including their foundations,
- c) Piping layout drawings including insulation giving sizes and lengths of all the pipes and the sizes and locations of all types of valves, and including isometric drawings for entire piping including pipe connections to the various equipments and insulation details wherever required.
- d) Duct layout drawings with their sizes and locations, and sizes and locations of all dampers, grills and diffusers.
- e) Line diagram and layout all electrical control panels giving switchgear ratings and their disposition, cable feeder sizes and their layout,
- f) Control wiring drawings with all control components and sequence of operations to explain the operation of control circuits.
- g) Comprehensive operation and maintenance manual
- h) Test certificates, consolidated control diagram and technical literature on all controls.
- i) Equipment warranties from manufacturers
- j) Commissioning and testing reports
- k) Rating charts for all equipment
- l) Log books as per equipment manufacturers standard format
- m) List of recommended spares and consumables
- n) Any special tools required for the operation or the maintenance of the plant shall be supplied free with the plant.

At the close of the work and before issue of final certificate of completion by the Engineer –in-Charge, the contractor shall furnish a written guarantee indemnifying the department against defective materials and workmanship for the Defects liability period. The contractor shall hold himself fully responsible for re installation or replaced free of cost to the department.

Any defective material or equipment supplied by the contractor.

Any material or equipment supplied by the department which is proved to be damaged or destroyed as a result of defective workmanship by the contractor.

Cassette type indoor units.

These units shall be installed between the bottom of finished slab & top of false ceiling.

The maximum allowable height for the cassette type units shall not exceed 350 mm.

The unit shall be pre charged with first charge of R 32 / R 134A / R 407 / R 410 refrigerant. Additional charge shall be added as per refrigerant piping at site.

The unit must have in built drain pump, suitable for vertical lift of 750 mm.

The unit casing shall be Galvanized Steel Plate / or as per manufacturer's specifications.

Unit must be insulated with sound absorbing thermal insulation material, Polyurethane foam. The noise level of unit at the highest operating level shall not exceed 42 dB(A), at a vertical distance of 1.5 m from the grille of the unit.

Unit shall have provision of connecting fresh air without any special chamber & without increasing the total height of the unit (288 mm maximum).

The unit shall be supplied with suitable decorative panel.

The unit shall be supplied with Resin Net filter with Mold Resistance. The filter shall be easy to remove, clean & re install.

The unit will be connected in series to a suitable outdoor unit & it must be possible to Operate the unit independently, through corded/ cordless remote specified in the "Bill of quantities". The unit will be further connected to Intelligent Building Management System (To be supplied by other vendors) & it shall be possible to operate the unit through this IBMS system.

The unit shall be supplied with following from the factory with following:

Operation Manual

Installation Manual

Paper pattern for installation

Drain hose/ Clamp metal/ Washer fixing plate/ Sealing pads/ Clamps/ Screws/

Washer for hanging bracket/ Insulation for fitting

B. Wall Mounted Units.

Wall mounted units must be compact & stylish design that does not detract from the Décor of the room.

The unit shall be precharged with first charge of R 32 / R 134A / R 407 / R 410 refrigerant.

Additional charge shall be added as per refrigerant piping at site.

Each indoor unit must have electronic expansion valve operated by microprocessor thermostat based temperature control to deliver cooling/ heating as per the heat load of the room.

The unit must have provision of adding drain pump kit if required & specified. The drain pump must be suitable to lift drain up to 1000 mm from the bottom of the unit.

Unit must be insulated with sound absorbing thermal insulation material, polystyrene/Polyethylene foam. The noise level of unit at the highest operating level shall not exceed 46 dB(A), at a vertical distance of 1.5 m from the grille of the unit.

The unit shall be supplied with Resin Net filter with Mold Resistance. The filter shall be easy to remove, clean & re install.

The unit grille must be washable with soap solution.

It shall be possible to set minimum 5 steps of discharge angle by remote controller.

It shall be possible to fit drain pipe from either side of the unit (Left or right)

The unit will be connected in series to a suitable outdoor unit & it must be possible to Operate the unit independently, through corded/ cordless remote specified in the bill of quantities. The unit will be further connected to Intelligent Building Management System(To be supplied by other vendors) & it shall be possible to operate the unit through this IBMS system.

The unit shall be supplied with following from the factory with following:

Operation Manual

Installation Manual

Installation panel

Paper pattern for installation

Insulation tape/ Clamps/ Screws

A – 1: COPPER TUBING.

The parent material used for air – conditioning system refrigerant tubing should be Copper tubes, tubes and fittings conforming to following specifications:

1. Material composition should be conforming to C-1220 (JIS-H-3300) or C-12200 (ASTM).It should have a minimum Copper content of 99.9 % and Phosphorus content between 0.015 % and 0.040 %. It should have low residue (below 0.038 gm / sq mtr). The material should also be as per the RoHS norms specified by EU; that is, Mercury, Chromium and Lead contents below 1000 ppm, and Cadmium content below 100 ppm.
2. Physical properties of the material should conform to JIS-H-3300 or ASTM-B-68 & B-75, should be tested for Tensile / elongation / hardness / grain size tests as per ASTM B –280.
3. Dimensional tolerance should be as per JIS-H-3300 or ASTM-B-251. The tubes should be tested using non-destructive Eddy current test before the final anneal, as per JIS- H-3300 or ASTM-E-243.
4. Heat treatment should be carried out in non-oxidizing atmosphere to ensure oxygen free and Cuprous oxide-free surface.
5. Proper certificates describing composition and results of all tests carried out must be supplied with each consignment. These certificates, along with check results for dimensional and thickness accuracy are recommended to be carried out for every delivered lot, should be maintained till handing over of the project.
6. Tubes should have 360 degree concentric wall thickness along their entire length.
7. Wall thickness for soft tubes (bright annealed mirror finish) should be 0.8 mm for ¼”, 3/8” & ½” tubes, 1.0 mm for 5/8” tubes, 1.2 mm for ¾” tubes. Wall thickness for

hard tubes should be 1 mm for 7/8", 1" and 1.1/8" tubes, 1.1 mm for 1.1/4", 1.2 mm for 1.3/8" and 1.3 mm for 1.5/8" tubes.

8. Wall thickness for elbows and fittings should be minimum 0.2 mm more than corresponding tube / tube size.

9. For 1/4" to sizes up to 3/4", pulley type benders should be used for soft tubes and brazed joints should be avoided as far as possible. Similarly, for half hard tubes of size 3/4" or more, one side expanded tubes must be used and use of couplings should be avoided as far as possible.

A -2 : TUBING DESIGN:

1. Contractor should study the tender / GFC drawings carefully, and should carry out detailed survey of site, relating the drawings with site, and understand the system design and site limitations.

2. Contractor should also collect final architectural and reflected ceiling plans from client and study the drawings for any mismatches with the HVAC drawings received.

3. Contractor should discuss any such mis- matches and any doubts regarding system design with the consultant and get all doubts clarified.

4. Before commencement of tubing work, proper shop drawings must be generated by the contractor, and same should be got approved from the consultant. The drawings must clearly indicate schematic flow diagrams for various circuits, tube sizes, description and quantities for refrigerant joints, indoor and outdoor unit models and room / block / floor names, tube routes, levels for horizontal tubes, details regarding insulation type and thickness and surface treatment for insulation, typical and critical sections and any other details to explain the entire tubing layout to the installer.

5. Tube sizing and routing must be carried out taking into consideration various site constraints and system manufacturer's recommendations.

6. Care should be taken to design tubing as per the manufacturer's recommendation for maximum tubing total length, maximum tubing length after first tapping, vertical height difference between outdoor and indoor units etc. and necessary corrections should be carried out in outdoor unit capacity if required.

A – 3 : REFRIGERANT TUBING INSTALLATION WORK:

1. The installer must first study the shop drawings in detail with respect to the site condition and point out any fouling / alternatives to the agency prepare shop drawing and necessary revisions must be carried out in the drawings, to be approved by consultant.

2. The layout must be marked on the true ceiling and any civil openings required should be marked and got done from concerned agency.

3. Supports as described in BOQ / specifications should be installed, leaving adjustable free length for supports.

4. Before installation, the tubes and tubes must not be removed from their original

packing. Proper storage of tubing is a must to maintain the temper of the tubes / tubes. Any abrasion on ends / surface, or any in grace of dirt / dust must be avoided. Proper Polyethylene sheets should be used for covering the tubes and tubes, while wooden pellets and soft expanded Polyethylene / rubber sheets should be used as floor supports.

5. Necessary loops / slopes must be followed as recommended by system manufacturer.
6. Tubes must be cut to required sizes using cutting tools recommended by system manufacturer.
7. Using proper quality of brazing set, Oxygen / Acetylene and Copper brazing rods having minimum 2% Silver content.
8. During brazing, Nitrogen must be filled in the Copper tubing at a mild positive pressure and must be kept bleeding out continuously, to prevent any oxidation of parent material.
9. After tubing work, each circuit should be pressure tested as per the system manufacturer's recommendation and as per the procedure described in the following paragraphs. A certificate mentioning the test pressure, time of first and final pressure readings, make, model, serial number, range and least count of the gauge used, along with a copy of valid calibration certificate must be maintained, duly signed by the inspecting technician, and client /PMC representative.
10. After pressure testing, insulation must be completed as per the material, make and thickness mentioned in the approved shop drawing. The joints of insulation must be sealed by minimum 50 mm wide Aluminium adhesive tape. Care should be taken to avoid any air gaps between tube / tube and insulation sleeves, and between two insulation sleeve joints.
11. Proper tagging must be carried out to trace the tubing to respective indoor and outdoor circuits.
12. The tubes exposed to sunlight must be covered / cladded / treated to prevent damage from UV radiation and bird pecks / tampering, as mentioned in the BOQ. The cladding should be made out of 26 G Aluminium sheet or G.S.S. sheet. While cladding, care should be taken to avoid penetrating the insulation by screws. Short screws Of metallic straps should be used for securing cladding sheets. Instead of cladding, glass cloth, with two coats of protective resin should be used.
13. While charging refrigerant, manufacturer's recommendations must be strictly followed, and charging must be carried out using proper charging hose, gauge manifold with calibrated gauges and electronic weigh scale. Further leak check using a gas leak detector should be carried out. Charging must be carried out after proper evacuation of the tubing. The quantity of refrigerant to be charged should be calculated by totalizing the liquid tube volume as per the manufacturer's recommendation.

A – 4 : RECOMMENDATIONS FOR PRESSURE TESTING:

Refrigerant tubes carry refrigerant at pressures different from atmospheric pressure.

When pressure inside tubes is more than atmospheric pressure, refrigerant may escape to the atmosphere, causing commercial loss due to loss of refrigerant, inefficient system performance or even system breakdown and contamination of surroundings. When pressure inside the tubes is less than atmospheric pressure, such as in case of suction tubes of some low temperature refrigeration machines, or during pump-

down cycle of normal air-conditioning systems, leakages in tubes leads to ingress of air and moisture, causing severe system damage. Therefore, it is a must that the refrigerant tubing is thoroughly tested for leakages. Pressure testing for any tubing must be carried out at a pressure higher than the maximum operating pressure within the system. It is recommended that the pressure recommended by manufacturer be followed very strictly. Testing at lower pressures may lead to non-detection of some small leakages, while testing at higher pressures may lead to damage to some factory manufactured components within the system. Generally, for R-410 systems a pressure of around 650psig is used. Nitrogen is the most common gas used for carrying out pressure testing. It has numerous advantages, some of which are listed below:

1. Nitrogen is easily available as a commercial gas packed in easy to handle cylinders.
2. Nitrogen, being the most abundant component of the atmosphere, is safe for leaking out without contaminating the atmosphere.
3. Nitrogen is less costly as compared with other gases.
4. Nitrogen is safe for handling and testing.
5. Nitrogen does not readily react with system components Pressure gauge/s used for testing must be calibrated and a calibration certificate with traceability to a Government(National) Physical Laboratory must be documented. The gauge should be capable of measuring pressure at least 10% above the reading to be recorded.

A – 5 : PROCEDURE FOR CARRYING OUT PRESSURE TEST

- 1) Ensure that the tubing to be tested is properly secured/supported and the openings have been sealed off as per manufacturer's recommendation.
- 2) Install pressure gauge/s at strategic location/s where it shall not be tampered with, at the same time, should be easily visible.
- 3) Install a valve and connecting tubing so that the open end of the tube reaches the cylinder outlet without moving the cylinder.
- 4) Connect the tube to the cylinder and after ensuring proper connection, crack open the cylinder valve, keeping an eye on the pressure gauge. Let the pressure rise to around 10 psig.
- 5) Check for proper sealing of all flanged / flare nut joints or valves/ valve glands looking for noise of escaping Nitrogen and seal same.
- 6) Open the cylinder valve again and raise the pressure to 200 psig.
- 7) Check the tube line for major leakages at brazed joints, elbows, valve glands, equipment end connections and tube seams with the help of soap water. Make up the leaks by tightening nuts. If the leaks are in brazed joints, flush out Nitrogen and carry out necessary re-brazing.
- 8) Open the cylinder valve again and increase the pressure to 150 psig less than the final test pressure. Repeat leak check as above.

- 9) Open the cylinder valve again and slowly raise the pressure to the manufacturer recommended pressure. Carry out a thorough leak check.
- 10) Record the pressure and time. Let the pressure stand for 24 hours without tampering. Check the pressure again after 24 hours. If pressure has dropped, the tubing should be checked very thoroughly for minor leakages. It is important to follow this 24 hours period as it gives enough time to detect minute leakages, and it removes the doubt created by thermal expansion of Nitrogen (as after exact 24 hours, ambient conditions are generally same).
- 11) In case of tubing extending to lengths more than 30 m and / or having more than 20 site fabricated joints, the pressure should be recorded after 24 hours as well as after 48 hours, so that all leakages are detected and made up.
- 12) After detecting and making up any leak, the pressure testing must be carried out once again from beginning.

A – 6 : DOCUMENTATION RECOMMENDED FOR ENSURING PROPER QUALITY ASSURANCE:

1. Manufacturer's certificate with every Delivery Challan declaring composition of parent material
2. Signed and approved Shop drawings approved by Architect, prior to start of work
3. Pressure test report signed by Architect/ Client / Equipment manufacturer / PMC / Consultant.
4. False Ceiling closure check list duly signed by Architect / Client / Equipment manufacturer/ PMC /Consultant.

GENERAL:

ACR GRADE COPPER TUBES AND FITTINGS : SIZES AND SPECIFICATIONS

Tube material Specification :

(CFC- free refrigerant compatible tubes produced using Total loss lubricants)

1. De-oxidized High Phosphorized copper (DHP grade) raw material, with Chemical Composition of Copper = 99.9 % ; Phosphorus = 0.015 to 0.040 %
2. RoHS Compliant
3. 360 degree concentric Wall thickness along the entire length of the tubes
4. Half hard drawn copper tubes should confirm to ASTM B75/ASTM280 (C12200) / JIS H:3300(C1220) / BS2871 part 3 (C106). Use Half Hard Temper Type for tube sizes above 19.1 mm.
5. Soft copper tubes, bright annealed (mirror finish) should confirm to ASTM B68 / JIS H:3300
6. Super clean quality with low residual content below the permissible levels of 0.038 g/m² for compatibility with use of CFC-free refrigerant.
7. 100 % Eddy Current Tested Tubes are to be used

8. Proper packaging, Storage and Traceability of the tubes.

Copper tube and Fittings Sizes and Insulation Specifications for CFC-free Refrigerant.

S. No.	OUTER DIAMETER IN INCH & (MM)	WALL THICKNESS IN GAUGE & (MM)	LENGTH IN FEET & (MTRS.)	TEMPER	WEIGHT PER METER (kg.)	SOCKET AND ELBOW THICKNESS IN SWG & (MM)	RUBBER INSULATION THICKNESS
1.	1/4" (6.4 mm)	21 (0.8 mm)	50' (15.24)	Soft	0.1265	18 (1.2mm)	15mm
2.	3/8" (9.5 mm)	21 (0.8 mm)	50' (15.24)	Soft	0.199	18 (1.2mm)	15mm
3.	1/2" (12.7 mm)	21 (0.8 mm)	50' (15.24)	Soft	0.2714	18 (1.2mm)	15mm
4.	5/8" (15.9 mm)	19 (0.99 mm)	50' (15.24)	Soft	0.4241	18 (1.2mm)	15mm
5.	3/4" (19.1 mm)	19 (0.99 mm)	50' (15.24)	Soft	0.5147	18 (1.2mm)	20mm
6.	1/4" (6.4 mm)	21 (0.8 mm)	12' (3.658)	Half Hard	0.1265	18 (1.2mm)	15mm
7.	3/8" (9.5 mm)	21 (0.8 mm)	12' (3.658)	Half Hard	0.199	18 (1.2mm)	15mm
8.	1/2" (12.7 mm)	21 (0.8 mm)	12' (3.658)	Half Hard	0.2714	18 (1.2mm)	15mm
9.	5/8" (15.9 mm)	19 (0.99 mm)	12' (3.658)	Half Hard	0.4241	18 (1.2mm)	15mm
10.	3/4" (19.1 mm)	21 (0.8 mm)	12' (3.658)	Half Hard	0.4164	18 (1.2mm)	20mm
11.	7/8" (22.2 mm)	21 (0.8 mm)	12' (3.658)	Half Hard	0.489	18 (1.2mm)	20mm
12.	1.0" (25.4 mm)	20 (0.88 mm)	12' (3.658)	Half Hard	0.6054	18 (1.2mm)	20mm
13.	1 1/8" (28.6 mm)	19 (0.99 mm)	12' (3.658)	Half Hard	0.7865	18 (1.2mm)	20mm
14.	1 1/4" (31.8 mm)	18.5 (1.1 mm)	12' (3.658)	Half Hard	0.843	16 (1.6mm)	20mm
15.	1 3/8" (34.9 mm)	18 (1.21 mm)	12' (3.658)	Half Hard	1.155	16 (1.6mm)	20mm
16.	1 1/2" (38.1 mm)	17.5 (1.3 mm)	12' (3.658)	Half Hard	1.340	16 (1.6mm)	20mm
17.	1 5/8" (41.3 mm)	17 (1.43 mm)	12' (3.658)	Half Hard	1.594	16 (1.6mm)	20mm

Use Soft tube only for Indoor Unit Connection

10. INSULATION TO REFRIGERANT PIPING:

FR nitrile rubber / cross linked closed cell polyethylene tube insulation of 13mm upto 1" dia pipes and 19mm thick for 1" and above shall be used for copper piping both for

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suction line and liquid line. All joints shall be sealed with self-adhesive tape or with heat.

11. COMMUNICATION CABLE AND CONTROL CABLING:

Communication cable and control cabling: Communication cable and control cabling should be of non-polar shielded 2 core cable shall be laid in 20 mm dia PVC conduits of required size. PVC conduit should be clamped neatly maintaining a distance from power cables, Cable terminations and dressing shall be done properly and neatly.

12. DRAIN PIPING:

PVC drain piping shall be used for the drain piping. Proper care shall be taken to lay the drain piping with sufficient slope and should be clamped or supported at 1.5 m interval. All drain pipe joints shall be done with adhesive. Drain piping should be tested for leaks before commissioning. After testing for leaks, drain pipe shall be insulated with 9 mm thick nitrile rubber tube insulation. Insulation shall be finished with self-adhesive black cotton tape.

1. DUCTING

Scope of work

The scope of work under the section comprises the supply, installation, testing and commissioning of all sheet metal ducts, dampers, grilles, diffusers, etc. as shown in the drawings and conforming to the specifications. Governing standards shall be SMACNA-1995 ("HVAC duct construction standards-Metal and Flexible-Second edition 1995" SMACNA) and IS -655.

GI Duct (Factory Fabricated ducting with factory fabricated flanges)

Materials & construction:

a.i.1.

All ductwork including straight sections, tapers, elbows, branches, show pieces, collars, terminal boxes and other transformation pieces must be factory-fabricated or by equivalent technology and shall be made out of galvanized sheet steel coils of Class-VIII (120 GSM). Coil lines to ensure location of longitudinal seams at corners/folded edges only to obtain the required duct rigidity and low leakage characteristics. No longitudinal seams permitted along any face side of the duct.

b.

All ducts, transformation pieces and fittings to be made on CNC profile cutters for required accuracy of dimensions, location and dimensions of notches at the folding lines.

All ducts wherever specified, shall be factory fabricated in box sections from G.I. continuous coils with all suitable joints, supports, sealing arrangements etc. The thickness of galvanized sheet and type of flange class at 1200 mm spacing shall be as follows.

Size of Duct	Sheet Thickness		Type of Flange / connectors
Up to 450 mm	0.63 mm	24 G	C&S cleats
451 mm to 750 mm	0.63 mm	24 G	Rolamate – E
751 mm to 1000 mm	0.8 mm	22 G	Rolamate – F
1001 mm to 1500 mm	0.8 mm	22 G	Rolamate – H
1501 mm to 1800 mm	1.0 mm	20 G	Rolamate – I
1801 mm to 2100 mm	1.0 mm	20 G	Rolamate – J
2101 mm and above	1.2 mm	18 G	Rolamate – J

The gauges, joints and bracings for sheet metal ducting work shall further conform to the provision as shown on the drawings.

Ducts larger than 600 mm shall be cross broken or straight beaded. Duct sections up to 1200 mm length may be used with bracing angles omitted.

Changes in section of duct work shall be affected by tapering the ducts with as long a taper as possible. All branches shall be taken off at not more than 45° angle from the axis of the main duct unless otherwise approved by the Consultant / Owner representative.

All ducts shall be supported from the ceiling / slab by means of fully threaded GI rods of 9 mm – 12 mm dia. with M.S. slotted double – C channel of 3.0 mm thickness at the bottom. The rods shall be anchored to R.C.C slab using metallic expansion fasteners.

1.3 GI Duct (Factory Fabricated ducting with angular iron flanges)

1.3.1 Materials & Construction:

All ducts wherever specified, shall be factory fabricated in box sections from G.I. continuous coils with all suitable joints, supports, sealing arrangements etc.

The material and the construction sheet metal ducts shall be as follows.

S.No.	Item Description	Material of Construction (MOC)
1	GI sheet	Cold rolled sheets of factory fabricated (Rolastar/ equivalent) GSS ducting, continuous galvanized with Zinc coating of 120 gsm (Class VIII), sheets conforming to IS-277-2003
2	Flanges, Stiffeners & Supports	Mild Steel structural steel with one coat red-oxide primer and two coats of black enamel paint
3	Gasket	White neoprene rubber of minimum 3.2mm thick (1/8")
4	Bonding / Sealant	Silicon based food grade sealant/ RTV
5	Bolts, Nuts, Rivets & Washers.	Mild steel continuous galvanized with zinc coating (MS with hot dip galvanizing)

The ducts construction shall be Rectangular type of Low/Medium Pressure classification.

The construction of ductwork shall be in accordance with the following schedule.

Schedule of Ductwork Metal Gauges (Galvanized Steel), joints and Bracings:

Dimension of Longest Side Of Duct (mm)	Min. Sheet thickness (mm)	Type Of Transverse Joint Connection	Type Of Bracing
Up to 600	0.63 (24 SWG)	25 x 25 x 3 mm (1" x 1" x 1/8") companion flanges on 2.4 meter centers.	None

601 to 750	0.63 (24 SWG)	25 x 25 x 3 mm (1" x 1" x 1/8") companion flanges on 2.4 meter centers.	25 x 25 x 3 mm (1" x 1" x 1/8") Girth angles @1200mm (48")
751 to 1000	0.80 (22 SWG)	40 x 40 x 4 mm (1 1/2" x 1 1/2" x 3/16") companion flanges on 2.4 meter centers.	25 x 25 x 3 mm (1" x 1" x 1/8") Girth angles @1200mm (48")
1001 to 1500	0.80 (22 SWG)	40 x 40 x 4 mm (1 1/2" x 1 1/2" x 3/16") companion flanges on 2.4 meter centers.	40 x 40 x 4 mm (1 1/2" x 1 1/2" x 3/16") Girth angles @1200mm (48")
1501 to 2250	1.0 (20 SWG)	40 x 40 x 6 mm (1 1/2" x 1 1/2" x 1/4") companion flanges on 1.0 meter centers.	40 x 40 x 4 mm (1 1/2" x 1 1/2" x 3/16") Girth angles @600mm (24")
2251 and above	1.25 (18 SWG)	50 x 50 x 6 mm (2" x 2" x 1/4") companion flanges on 1.0 meter centers.	50 x 50 x 4 mm (2" x 2" x 3/16") Girth angles @600mm (24")
Plenums	1.6 (16 SWG)	50 x 50 x 6 mm (2" x 2" x 1/4") companion flanges on 1.0 meter centers.	50 x 50 x 6 mm (2" x 2" x 1/4") Girth angles @600mm (24")

Ducts larger than 600 mm shall be cross broken or straight beaded. Duct sections up to 1200 mm length may be used with bracing angles omitted

In addition to above the following points should be also taken into account while fabrication of ducts

- Girth angles and companion flanges shall be mitered and welded at corners and riveted to duct sheets at 75mm (3") centers.
- Flanges and joints shall be made with 9.5mm (3/8") GI bolts spaced at 100mm (4") centers and provided with 3.2mm (1/8") white neoprene rubber gasket.
- All joints and seams shall be rendered air tight with mastic sealant. Longitudinal seams shall be inside groove of Pittsburgh type. The use of sheet metal screws is forbidden. Rivets, nuts and bolts or some other device approved by the consultant / Owner.
- All reinforcing angles, bracing, etc. shall be painted with red oxide and black enamel paint after installation.
- All four sides of un-insulated ductwork of dimension 300mm or larger shall be cross-broken.

1.4 Duct work Supports

All horizontal ducts shall be supported by means of trapeze type hangers, consisting of angles and speed nuts and threaded hanger rods affixed to the structure. Hangers shall be affixed to wooden

structure by lag screws, to concrete with screw concrete inserts or expansion cases, and to steel with C-clamps. All ducts shall be supported with mild steel rods not less than 6mm dia. The duct supporting details as follows.

Schedule of supporting rods, angle sizes and Spacing:

Duct perimeter (mm)	Rod. Dia. (mm/Inch)	Shelf Angle	Spacing mm
Up to 1500	9.0 (3/8")	40mm x 40mm x 5mm	2400
1501 to 2500	12.5 (1/2")	40mm x 40mm x 6mm	2400
Over 2500	15.0 (5/8")	50mm x 50mm x 6mm	2400

Vertical ductwork fastened on wall shall be supported by means of galvanized band hangers or angle brackets. The hangers shall be fastened to the wall by means of a fastener. The ductwork shall be bolted to the hanger. The angle brackets shall be 25mmx25mmx3mm for duct of longest side up to 600mm, 40mm x 40mm x 4mm for duct of longest side up to 1200mm and 50mm x 50mm x 6mm for duct of longest side over 1200mm. The spacing of angle bracket shall not be more than 2400.

For vertical ductwork, wherever possible shall be supported at floor levels by angle supports projecting beyond the opening in the floor. Angles shall be bolted to ducts. The angles shall be 40mm x 40mm x 4mm for duct of longest side up to 1500mm and 50mm x 50mm x 6mm for duct over 1500mm.

Additional hangers beyond those specified above shall be installed at bends, transformations (reducers / rectangular to circular vice versa) and take-off connections as required.

Notwithstanding the above, certain ductwork located in critical areas shall be supported by means of resilient supports or hangers.

1.5 Installation & testing

During the construction, the contractor shall temporarily close duct openings with sheet metal covers to prevent debris entering ducts and to maintain opening straight and square, as per direction of Engineer-in-Charge.

Great care should be taken to ensure that the ducting work does not extend outside and beyond height limits as noted on the drawings.

All duct work shall be of high quality approved galvanized sheet steel guaranteed not to crack or peel on bending or fabrication of ducts. All joints shall be air tight and shall be made in the direction of air flow. The ducts shall be reinforced with structured members where necessary, and must be secured in place so as to avoid vibration of the duct on its support.

All air turns of 45° or more shall include curved metal blades or vanes arranged so as to permit the air to make the abrupt turns without an appreciable turbulence. Turning vanes shall be securely fastened to prevent noise of vibration.

The ducting work shall be varied in shape and position to fit actual conditions at building site. All changes shall be subjected to the approval of the client representative. The contractor shall verify all measurements at site and shall notify the Engineer-in-Charge. The contractor shall verify all measurements at site and shall notify the Owner representative of any difficulty in carrying out his work before fabrication.

Self-adhesive sponge rubber / PVC gaskets of 6 mm maximum thickness shall be installed between duct flanges as well as between all connection of sheet metal ducts to walls, floor column, heater casing and filter casings. Sheet metal connections shall be made to walls and floor by means of wooden member anchored to the building structure with anchor bolts and with the sheet screwed to them.

Flanges & bracing angels shall be made out of M.S angel iron. All flanges and bracing angles shall be pre painted with black enamel paint. The connection shall be 4 bolts slip on type flange system with sealant injected within the flanges. Accessories such as damper blades and access panels are to be of materials of appropriate thickness and the finish similar to the adjacent ducting, as specified.

Joints, seams, sleeves, splitter, branches, take-offs and supports are to be as per duct details as specified, or as decided by client representative.

Hexagon nuts and bolts, stove bolts or buck bolts, rivets, or closed centre top rivets, or spot welding may fix joints requiring bolting or riveting. Self-tapping screws must not be used .All jointing materials must have a finish such as cadmium plating or galvanized as appropriate.

More generally, the ducting shall conform to Leakage Class CL-3 of HVAC Air duct Leakage Test Manual SMACNA 1985. This implies leakage equivalent to or less than 3% of total airflow rate at a static pressure of 50 mm of WC and also corresponds to a leakage rate of about 0.72 cmh-m-2 of duct surface area. All ducting & AHUs shall be tested at site to prove compliance with the above requirements.

The duct leakage testing rig could consist of a fan with damper (for varying flow rate) the flow measuring devices like Orifice plate assembly with manometer (for measurement of flow rate) and manometer (for measurement of static pressure) together with necessary ducting.

1.6 Duct Masonry

Unless, otherwise noted where ducts are shown connecting to masonry openings and/or along edges of all plenums at floor, walls, etc. There shall be provided a continuous 40mm x 40mm x 6mm pre-painted angle iron which shall be bolted to the structure and made air tight by caulking. This sheet metal at these locations shall be fastened to the angle irons.

➤ Elbows and Bends in Ductwork

On all elbows or turns, the center line radius shall not be less than one and one-quarter times the duct width unless otherwise shown on the drawings. Where right-angle bends are used, double thickness aero foil turning vanes shall be incorporated.

2. DAMPERS

3. GI Volume Control dampers

The dampers shall be manufactured from 16 gauge galvanized sheet steel. The dampers shall be opposed blade type and has heavy cast iron indicating quadrant lever with wing nut. The damper shall complete with PVC knob operation, status indicator locable in closed/ or open position.

Both damper casing & blade shall be made out of 1.6 mm thick Galvanized sheet steel. The damper shall have chrome plated spindles and self-lubricating bronze bushes. The minimum depth of the damper shall be 150mm. For the dampers wider than 1200mm; two or more sections shall be used separated by a mullion and with blade tie rods inter-connected. The blades shall be mounted in an integral channel frame which shall be mounted on the duct. The blades shall be center and edge crimped and reinforced as required, and shall be supported on steel shafts running in oil impregnated bronze bearings. The operating shafts shall extend through the duct wall for operation by a hand quadrant lever. Individual blades shall be connected by a mechanical linkage so that they operate in unison. The control arm must be fastened to the shaft by means of a steel dowel shaft key or a similar approved penetrating device.

Set screw alone will not be acceptable. The blades shall have rubber strips fastened securely to the edges to ensure tight enclosure. The complete assembly shall be rigidly constructed, be free from rattles and shall operate freely.

4. Fire Dampers

Fire dampers shall be supplied and fitted as and when shown on the accompanying drawings and within the thickness of the various fire break walls, partitions and floor slabs. The fire dampers shall comply in all respects and confirming to and tested as per UL555S. Fire dampers shall be type tested and approved by CBRI, Roorkee.

All supply/return air ducts at AHU/ fan section shall be provided with approved fire damper of at least 90minutes fire ratings.

- The damper shall be constructed to the following requirements:
- The damper shall be constructed of galvanized sheet steel of 16 gauge with welded joints and flanged ends for connecting to the ductwork.
- The blade shall be single or multi-blade of 16 gauge GI, weighted type steel plate arranged to swing freely and automatically into place when released by the fusible link mechanism.
- Internal small angle iron guide-stops shall be fitted to ensure and efficient seal when the damper blade is closed position.
- The fire damper shall lock shut positively and shall be opened manually.
- The damper shut or opened position shall be indicated by means of an external indicator.
- Fusible links shall be arranged to break at 155°F at (68°C) and shall be connected and anchored to welded internal lugs by means or non-corrodible multicore wire. The position of the fusible links when assembled shall be chosen so that they may be easily inspected and adjusted through access panels cut in the G.S.S. ductwork. In all cases the ductwork access panels shall coincide with the removable portions of the false ceilings whenever they occur.

The space between the fire damper body and the opening in the wall shall be filled with an approved compressible non-combustible material for the full thickness of the wall.

5. Insect Screens

Non-corrodible insect screens shall be provided and fixed behind all intake and discharge louvers grilles and openings where these occur on the outside of the building. The screens shall be of suitable bronze fine mesh and fixed in such a manner so as to be easily removable for periodic cleaning.

6. GRILLS /DIFFUSERS

7. Fresh Air Intake Louvers With Bird Screen

The fresh air intake louvers at least 50mm deep will be made of powder coated extruded aluminum construction. Bird / insect screen will be provided with the intake louvers. The blades shall be inclined at 45 degree on a 40mm blade pitch to minimize water ingress. The lowest blade of the assembly shall be extended out slightly to facilitate disposal of rain water without falling on door / wall on which it is mounted.

The intake louvers shall be provided with factory fitted volume control dampers in black finish

8. Diffusers, Register and Grille Finishers

All diffusers, grilles and registers provided and fixed shall be of natural anodized aluminum construction. Alternative colour finishes shall be provided where specified.

Where steel construction diffuser or grille is specified and supplied, the metal shall be cleaned of all rust and all welded flux and all grease removed and then painted with 1-coat of primer, 2-coat of undercoats and 1-top coat of full gloss paint. The finish shall be baked-enamel or equal approval.

9. Diffusers, Register and Grille Installation

All diffusers, grilles and registers must be rigidly fastened to the ducts in a neat and workmanlike manner. The joint between the supply grilles, etc. and the duct must be fitted with a felt or rubber gasket or other suitable means to make the joint air tight, so that air will not blow out between the grille frame and the duct opening producing duct streaks on the duct or wall.

Grille and register position shown on the drawings are approximate except where otherwise noted. The Contractor shall make such adjustments in position as and when necessary to ensure conformity with the Architectural drawings and the requirement of outlets by other trades without extra charge.

On furred-in ductwork, the sheet metal grille collar shall be suitably reinforced with a wood frame on the outside of the collar in order to prevent it from being forced out of shape.

10. Sample for Approval

Fully finish samples of supply and return diffusers/grilles as they will be fitted shall be submitted to the Owner for approval before any bulk manufacture or purchase is commenced.

11. Testing

The complete duct system shall be tested for air leakage & complete air distribution system shall be balanced in accordance with air quantities indicated on the approved drawing

Material and Process for Roof Under deck insulation

Unless otherwise noted, all the exposed roofs are thermally insulated with 32 mm thk closed cell nitrile rubber. The thermal conductivity shall be not more than 0.035w/m⁰k at mean temperature of 20 °C.

The application of insulation shall be as follows.

- a) Roof surfaces shall be cleaned with wire brush & dry mopping cloth and shall be free from dust and other foreign particles.
- b) For the cleaned roof surface, cut piece of insulation shall be stuck with fivicol / Equivalent rubber adhesive and needs to wait up to 10 – 15 minutes and this will help to form adhesive as a film to stuck.
- b) Secure the insulation sheet in potion with the help of screws, rawl plugs, washers and 28G GI cross wire lacing to avoid any kind of sagging. End of net shall be overlapping by at least 25mm. Overlaps shall be screwed with GI screws to avoid rusting.
- c) All longitudinal & transverse joints shall be sealed with 50 mm wide self-adhesive aluminum tape.

B. AIR DISTRUBUTION SYSTEM

SCOPE

Supply, Factory fabrication, installation and testing Double Wall thermal insulated of all sheet metal oval ducts & supply, installation, testing and balancing of all grills, registers and diffusers, in accordance with these specifications.

DUCTING

GENERAL

All ducts shall be factory fabricated from galvanized steel sheets of the following thickness as indicated in schedule of quantities & as described in the IS: 655 with latest edition. The ducting shall be made out of Lock former machine or factory fabricated to avoid site work to the minimum.

RECTANGULAR/ROUND DUCT

Dimensions of Ducts(mm)	Gauge	Alumni	Type of Joints	Type of Slip joint
Upto 600	24	22	G.I Flange at 2.5 Center	Cross bracing's

601 to 750	24	22	25 x 25 x 3 mm angle frame with mm from and bolt joints	25 x 25 x 3 mm MS angles bracing 6 mm dia nuts at 1500
751 to 1000	22	20	25 x 25 x 3mm angle frame with 6mm dia nuts and bolts	25 x 25 x 3 mm MS angle bracing at 1500mm from joints
1001 to 1500	22	20	40x40x5 mm angle frame with 8mm dia nuts and bolts	40 x 40 x 3mm MS angle bracing at 1500mm from joints
1501 to 2250	20	16	50x50x3mm angle to be cross braced diagonally with 10mm dia nuts & bolts at 125 center.	40 x 40 x 3mm MS angle bracing at 1200mm from joints or 40x 40 x 3mm MS angle diagonal bracing.

Sheet metal ducts shall be fabricated as per BIS/SMACNA Standards out of galvanized steel sheets. Sheets used shall be produced by hot dip process and galvanizing shall be Class VIII - Light Coating of zinc nominal 120 gm/sq. m.

Total ducting shall be iron angle flanges

HANGERS FOR DUCT (as per standards)

Duct Size(mm)	Spacing (Mtr)	Size of MS angle (mm x mm)	Size of rod dia (mm)
Up to 750	2.5	40 x 3	10
751 to 1500	2.0	40 x 3	12
1501 to 2250	2.0	50 x 3	15
2251 & above	2.0	50 x 3	15

INSTALLATION

All ducts shall be installed generally as per the drawings prepared by the Contractor.

The Contractor shall provide and neatly erect all sheet metal work as may be required to carry out the intent of these specifications. The work shall meet with the approval of Owner's site representative in all its parts and details.

All necessary Allowances and Provisions shall be made by the Contractor for beams, pipes, or other obstructions in the building, whether or not the same are shown on the drawing. Where necessary to avoid beams or other structural work, plumbing or other pipes, and/or conduits, the ducts shall be transformed, divided or curved to one side, the required area being maintained, all as per the 'site requirements.'

If a duct cannot be run as shown on the drawing, the contractor shall install the duct between the required points by any path available, in accordance with other services and as per approval of Owners site representatives.

All ductwork shall be independently supported from the building structure. All horizontal ducts shall be rigidly and securely supported, in an approved manner with trapeze hangers formed of

galvanized MS rods and angle iron under ducts at not greater than 2 meter centers. All vertical duct work shall be supported by structural members at 2 Meters intervals. Air conditioning contractor shall supply and install all supports made of galvanized steel material and shall be of hi-tech supports only. The supports shall be designed to prevent vibration to be transmitted to the building structure by providing vibration isolation. If duct is passing through in such areas where space between ceiling slab to false ceiling is more than 1500 mm then duct should be supported by wall mounted brackets of 40 x 40 x 3mm angle.

Where metal ducts or sleeves terminate in woodwork, tight joints shall be made by means of closely fitted heavy flanged collars. Where ducts pass through brick or masonry opening, wooden frame work shall be provided within the opening and crossing ducts provided with heavy flanged collars on each side of wooden frame work, so that duct crossing is made leak-proof.

All ducts shall be totally free from vibration under all conditions of operation. Whenever duct work is connected to fans, air handling units or blower coil units that may cause vibrations in the ducts, ducts shall be provided of fire retardant rubberized canvas cloth flexible connection. The flexible connections should be located close to the unit, in mutually perpendicular directions. The flexible sleeve should be at least 15cm long securely bonded and bolted on both sides. Sleeve shall be made smooth and the connecting ductwork rigidly held by independent supports on both ends. The flexible connection shall be suitable for pressures at the point of installation.

Air conditioning unit and exhaust fans shall be connected to duct work by inserting at air inlet and air outlet a double canvass sleeve. Each sleeve shall be minimum 150 mm securely bolted to duct and the connecting ductwork rigidly held in line with unit inlet or outlet.

SPLITTERS AND DAMPERS

Duct / collar dampers shall be opposed blade type of robust construction and tight fitting. They shall be made of G.S. sheet minimum 16swg thick and shall have brass bushes. The design, method of handling and control shall be suitable for the location and service required. Dampers shall be provided with suitable links, levers and quadrants as required for their proper operation. Control or setting devices shall be made robust, easily operate-able and accessible through suitable access doors in the ducts. Every damper shall have an indicating device clearly showing the damper position at all times. Handles will be provided with extended arms to account for insulation thickness. Dampers shall be placed in ducts and at every branch supply or return air duct connection, whether or not indicated on the drawing, for the proper volume control and balancing of the system.

FIRE DAMPERS

All supply / return air ducts of air handling units and return air openings shall be provided with approved fire dampers of at-least 1 1/2 hour fire rating. These shall be of approved make. The damper shall be fabricated of 16gauge GSS housing with blades formed out of 1.6 mm sheets. The damper shall be pivoted on both ends using chrome plated spindles in bronze bushes. The stop seals shall be provided on top and bottom of the damper housing. The damper blades shall be held in horizontal position using spring actuator bimetallic fusible link. The damper blades shall close in the event of fire by motor actuation capable of taking signal from the controller.

SUPPLY AND RETURN AIR GRILLS

Supply and return air grilles shall be of anodized extruded Aluminium construction with adjustable bars. Supply air grilles shall be generally double deflection type backed with GI damper. The supply/return air grilles being provided with removable key operated volume control dampers. Aluminium supply and return grilles shall be powder coated and should have the color of client's choice as per bill of quantities.

SUPPLY AND RETURN AIR DIFFUSERS

The supply air diffuser shall be provided with removable key operative volume control dampers. Aluminium supply and return air diffusers shall be powder coated and should have the colour of client's choice or shall be extruded Aluminium. Supply/return air linear diffuser shall be Extruded Aluminium construction, square, rectangular, or round diffusers with flush fixed pattern or adjustable flow pattern. Diffusers for different spaces shall be selected in consultation with the Client/Consultants

TESTING / ADJUSTING / BALANCING - TAB -AIR SIDE :

Scope: Scope of this section comprises of the Testing, Adjusting and Balancing (TAB), of Air distribution system confirming to the specifications.

GENERAL CONDITIONS: After completion, all duct systems shall be tested for air leakage.

The entire air distribution system shall be balanced to supply the air quantities as required in the various regions and rooms to maintain the specified room conditions.

The air quantity shall be measured and if need be the motor pulley need to be changed to site requirement when balancing the system.

The entire air distribution system shall be balanced to supply the air quantities as required in the various regions and rooms to maintain the specified room conditions.

The final balance of air quantities and its temperatures through each grille, register or diffuser shall be tested and recorded and submitted to the project manager for approval.

AIR BALANCING: On completion of the work, the system shall be demonstrated to the satisfaction of the Engineer and air flow at each fan outlet and all air distribution outlets is correctly adjusted and regulated, to fulfil its specified functions and as per designed airflow rate.

The work shall be carried out in accordance with the approved commissioning schedule and shall cover, but not necessarily be limited to, the following activities. The entire air distribution system shall be balanced with the help of an anemometer. The measured air quantities at fan discharge and at the various outlets shall be within 5 percent of those specified / quoted. Branch duct adjustments shall be permanently marked after the air balancing is completed so that these can be restored to their correct position if disturbed at any time.

Air circuit clean-up shall be carried out and all internal debris and foreign matter removed prior to the commencement of commissioning. The functioning of the total system and all ancillary units shall be demonstrated and shown to be operating consistently within the prescribed limits.

- After Total System balance, the following values shall be measured and recorded.

1. FanRPM
2. Motor voltage and amperes
3. Static pressure entering the Fan
4. Static pressure leaving the fan

BALANCING AIR TERMINALS PROCEDURE

- Depending upon location and access to air terminals, various types of airflow measuring instruments will be utilized to record the actual airflow at terminals.

- Assuming adequate access provided, a direct reading balometer would be used which gives a direct reading of volume rather than velocity, which cancels out the need for effective grille areas, terminal configuration consideration and velocity corrections.

- If access is restricted then a rotating vane anemometer shall be used and the velocity reading obtained would be converted to volume (velocity x free area = volume) and a comparison between the pitot traverse reading will be made to obtain a correction factor which would be incorporated to give a true velocity reading.
- Alternatively, the effective area provided by the register / grille manufacturer will be incorporated in the design velocity calculations.
- Test results shall be recorded in the approved test sheets and documents.

3.0 FILL THE TECHNICAL DETAILS FOR ALL OUTDOOR AND INDOOR UNITS

TECHNICAL DETAILS FOR OUTDOOR UNIT			
S.No	Paramater	Unit	Details
1	Make and Origin		
2	Model	Model	
3	Capacity	HP	
4	Operating Ambient Temperature Range	degC	
5	Power Supply		
6	Refrigerant		
7	Refrigerant Precharge Quantity		
8	Number of compressors		
9	Compressor Type		
10	Cooling Capacity	Kw	
11	Cooling Capacity	BTU/HR	
12	Power Input	Kw	
13	Tonnage	TR	
14	EER		
15	ISEER		
16	IKW / TR	Kw	
17	Dimension (In MM)	H x W x D	
18	Net weight	Kg	
19	Shipping Weight (apprx)	Kg	
20	Refrigerant pipe connections		
21	Liquid		
22	Gas		
23	Air cooled condenser		
24	Type		
25	Fan Type		
26	Number of fans		
27	Air Quantity	CFM	
28	Motor Type		

TECHNICAL DETAILS FOR INDOOR UNIT			
S.No	Paramater	Unit	Details
1	Tonnage		
2	Make and Origin		
3	Model	Model	
4	Airflow Rate	CFM	
5	Number of speeds		
6	External static	Pa	
7	Capacity at nominal conditions (TR)		
8	Temperature control		
9	Refrigerant control		
10	Operating sound	dB	
11	Power Input	Kw	
12	Number of fan motor in evoporating and rating		
13	Casing material and finish		
14	Dimension in mm	H x W x D	
15	Net weight	Kg	
16	Filter material and rating		
17	Evaporator copper tube size & thickness (OD) and refrigeration		
18	Surface area on air side and refrigeration		

**LIST OF APPROVED MANUFACTURERS / NATURAL SOURCES OF MATERIALS TO BE USED
IN THE AC WORKS SUBJECT TO THE APPROVAL OF SAMPLES BY THE CONSULTANT.**

<u>S.No.</u>	<u>Material Name.</u>	<u>Brand / Manufacturer / Recommended Make.</u>
1.	VRV/F Out Door Unit	AS specified in the NIT
2.	VRV/F- Indoor Units Cassette Type	AS specified in the NIT
3	VRV/F-Indoor Units Hi Wall Type	AS specified in the NIT
4.	Refrigerant Joints / Multi kits	AS specified in the NIT
5.	Refrigerant Piping	Mandev / Rajko
6.	PVC Drain Piping	Mandev / Rajko/Sudhakar pvc
7.	GI Sheets	TATA / HSL / SAIL / NIPPON DENRO
8.	Fire Damper	Caryaire / AirMaster / Air Breeze / Ravistar
9.	Vibration Isolators / FlexibleConnectors	Resistoflex / Dunlop or approved equivalent.
10.	INSULATION / Fibre glass	UP Twiga / Kimmco / Owens corning
11.	Power Cables	CCI / ICC / Gloster / UCL
12.	Control Cables	Finolex / Delton or approved equivalent.
13.	Aluminum Grilles Diffusers /Linear Grilles	Caryaire / Air Master / Air Breeze/SRIFABS
14.	Filters	Klenzaids / Airtech / Aerosol / Anfilco
15.	Cooling Coils / Heating Coils	Bluestar / Rohini / Ethos / Carrier / Jaypee / Coil Company / ZECO
16.	Nitrile rubber	Armaflex / vedoflex /AERO FLEX/ARMACELL

NOTE : The contractor shall use only above mentioned materials. All other materials shall confirm to the specifications laid down. The tenderer shall take this into account while tendering rates / prices. The Consultant / SBI has got every right to select any of the above Makes for the Project. However the samples of every material including all fixing accessories shall be got approved by SBI / Consultant before Execution.

Payment term for the AMC

- i) No advance payment.
- ii) Quarterly payments will be released after the end of the quarter subject to deductions for shortfall in services
- iii) Field reports of the PM and breakdown maintenance reports shall be enclosed to the Invoices
- iv) For AMC - 3 months AMC amount in the form of PBG as required by Bank will have to be submitted by the contractor.

SPECIAL CONDITIONS OF CONTRACT

Preventive and Breakdown Maintenance during Warranty Period & CAMC:

1. All the Air-conditioners covered in this contract have to be maintained as per the standards of the original manufacturing company during the warranty period as well as CAMC
2. The warranty would be on-site and comprehensive in nature and back to back support from the OEM. The vendor will warrant all the spares against defects arising out of faulty design, materials and workmanship etc. during the period of warranty. After the Warranty period of newly installed AC units expire, then these units are to be maintained by the Contractor till the expiry period of CAMC.
3. In case of CAMC of the existing ACs, the contractor has to repair /service/ maintain the air conditioners under the CAMC in as is where is condition when handed over to them under CAMC.
4. All required tools and tackles (in good working condition) necessary for carrying out repair and maintenance works of Air Conditioners under CAMC have to be provided by the vendor.
5. Professionally qualified personnel who have expertise in the AC supplied by the vendor will be permitted to undertake Preventive Maintenance/repair services during the period of warranty and CAMC period.
6. During the term of the contract, the vendor will maintain the equipment in perfect working order and condition and for this purpose will provide the repairs and maintenance services as under:

Type of Service	Warranty Period	AMC
Preventive Maintenance	Every Quarter	Every Quarter
Breakdown Maintenance	Within 48 hours of complaint	Within 48 hours of Complaint

Preventive maintenance: The Vendor shall conduct the following activities under Preventive Maintenance once within first 90 days of the installation of new ACs and once in every quarter thereafter, during the currency of this agreement or on a day and time to be mutually agreed upon. Notwithstanding the foregoing, the Vendor recognizes Bank's operational needs and agrees that Bank shall have the right to require the Vendor to reschedule preventive maintenance from any scheduled time to a date and time not later than 15 working days thereafter.

Sno	Activity
1.	Inspection of the AC – IDU and ODU for any abnormality in operation, sound etc
2.	Testing the Performance of AC for desired cooling
3.	Testing of Gas pressure if necessary and check for any leakages near the check nut etc or diagnose any other fault
4.	Checking of current consumption
5.	Remove the filter, water service and fix it back after drying
6.	Clean the drain tray and drain pipe and remove any choke for free flow of drain water
7.	Clean the Evaporator with brush and remove the dirt/dust. Check for any fungus formation or bad smell and wash it with chemical, if required.

8.	Lubricating /greasing of all Fans
9.	Water washing of Condenser Coil
10.	Topping of Refrigerant gas, if required
11.	Check the swing motor functions and rectify, if required
12.	In addition to the above, any other activity to ensure trouble free operation of AC
13.	Check the temperature setting and operation mode and advise the Branch on the optimum operation levels

7. This comprehensive Contract includes replacement of all faulty spares. Some of the spares are listed as under:

Compressors	Starting Capacitors
Fan Motors	Running Capacitors
Built – in Timer kit	Relays, Thermostats
Selector switches	Fan Capacitors
Contactors (Power / Control)	Gas charging
Micro Swing Motors	Fan blades
Electronic Control Circuitries	Air-Filters
Remote Control Units	Condenser Coils
External Electronic / Analog time switches for timed running of A.C's	Stabilizers
Outdoor unit mounting frames	Cabling from IDU to ODU
Parts of indoor / Outdoor unit enclosures	Existing copper piping from IDU to ODU
Display unit in AC	Existing drain piping from IDU to drain point

Note: The above list is only indicative. However, any parts which are not mentioned in the Tender Schedule of this Contract but required for the smooth and trouble free operation of the AC equipment are also required to be rectified or replaced within the scope of this contract.

8. **Working Hours for Repair and Maintenance:**

All activities under the scope of the contract shall be undertaken during working hours i.e. from 10.00 A.M. to 6.00 P.M. on all working days (viz. Monday to Saturday). In case any defects, faults and failures in the AC could not be repaired or rectified during the said period, the technicians are required to accomplish their duties beyond the said schedules in case of any situation, if it warrants.

9. **Replacement of Spare parts:** The required spares shall be kept as stock with the vendor for readily replacing the faulty spares, without loss of time or delay. In cases where unserviceable parts of the equipment need replacement, the vendor shall replace such parts, at no extra cost to the Bank, with brand new parts or those equivalent to new parts in performance. Any worn or defective parts withdrawn from the equipment and replaced by the vendor during the warranty period shall become the property of the vendor and the parts replacing the withdrawn parts shall become the property of Bank.

Defective spares compressors / condensers are to be replaced with new compressors / condensers and repairing of the old compressors is not permitted. Whenever new compressors / condensers are used, the Contractor has to produce original invoice and Warranty Card of the new Compressor/ condenser if demanded by the Bank. The compressor/ condenser being replaced should match with the **original star rating** of the air conditioner.

10. Only original spare parts/quality approved by the Bank will be permitted to be used for the maintenance during the AMC Period. If duplicate, refurbished or second hand parts are used by the vendor during the AMC, the contract shall be cancelled immediately without any notice period.

11. It is the responsibility of the Contractor to accurately specify the damaged spare parts to the Bank and to rectification of the fault in A.C under maintenance.

Response Time on receiving the complaint: The maximum response time i.e. time required for Vendor's maintenance technicians to report to the Bank after a request call / fax /e-mail is made or letter is written by Bank shall not exceed 48 hours.

Apart from regular letter communications, all telephonic/E-mail or Whatsapp communications from Bank are to be treated as formal communication for all practical purposes.

Escalation Matrix: The mobile number, land line number and email ID of the Contractor/Supervisor/Help desk to whom the complaints have to be reported and that of Top Management level is to be provided to Bank for communication purpose. Any change in numbers shall be advised then and there to the Bank.

Time taken for Repairs/Rectification: In case of Minor technical problems same are to be rectified within 3 hours of diagnosing of fault. In case of major technical problems, the same are to be rectified within 24 hours of identifying the problem.

In the event of the equipment not being repaired or a workable solution not provided during Warranty period and the AMC period, a penalty as per the penalty clause will be charged to vendor. The vendor may provide temporary equivalent replacement as a workable solution to avoid the above penalty.

Insurance for the Workmen: The technicians deployed under AMC are to be covered by insurance under Workman Compensation Policy through reputed Insurance Companies during the AMC Period. If demanded, Copies of the Insurance Policies are to be submitted to the Bank by the vendor.

Bank is not responsible for any loss of life, damage, injury to the technicians while undertaking the Maintenance activity under AMC contract or during the installation of new AC units. Vendor to ensure that all safety protocols are strictly followed while execution of the work. Vendor shall indemnify the Bank against any claims, damages, compensation for such losses.

12. **Extended Period of AMC:** In case the Bank needs the AMC service beyond the period of AMC, additional AMC Charges will be paid on the pro-rata basis for the period for which these units are to be maintained at the same unit rate as applicable to similar item in the original AMC and on the same terms and conditions of the AMC.

13. **Increase / Decrease of ACs:** If Bank decides that the additional number of air-conditioners other than the quantity mentioned in the tender are to be maintained by the Contractor, the contractor shall agree and maintain the ACs till the expiry period of AMC as per the same terms and conditions of the Contract. Proportionate amount of AMC shall be paid by the Bank for the same.

14. If any units covered under these AMC are removed/dismantled/shifted from this location to another location, the Contract amount as per the unit rate of the Tender will be revised and suitable deductions made from the AMC bills.

Other: The Bank has installed its own transformer for the site premises, hence the power supply is stable and is well regulated. The bank will not admit any claim from the contractor that the fault/damage is caused due to quality of power supply and it will not absolve the responsibility of the contractor in rectifying the fault.

The successful Vendor has to rectify the faults or repairs to the AC machines arising due to rat bites also free of cost within the scope of the contract. Vendor should also analyze the site conditions and take efforts to secure the AC equipment from the rodent bites by proper wrapping of the critical components with suitable glass wool packing or any other material and closing the opening made for the AC piping & drains properly to avoid rodent entry.

15. Details of important programs / functions of the Bank such as Conference, Review Meeting, VVIP functions etc that may be held in the Office will be informed to the contractor and they should assist the Bank in maintaining smooth running of the air-conditioners on that day without failure even if they are held on Bank Holidays. Non-attendance of the technicians on such a day will attract penalty at the discretion of the Bank.

All security and safety regulations and guidelines as per the applicable law are to be followed. All guidelines/directions of Bank's Security Section must be followed.

Complaint / Service / Breakdown Register:

The Bank shall maintain a register at its site in which, the Bank's AC operator / Electrician or any other person identified by Bank shall record each event of failure and / malfunction of the ACs. The Vendor's technician shall enter the details of the air conditioners serviced/ maintained / repaired by him in this register. Additionally, every time a preventive or corrective maintenance is carried out, the Vendor's engineer shall make, in duplicate, a Service call report which shall be signed by him and thereafter countersigned by the Bank's official. One copy of the Service call report shall be handed over to the Bank's official. Spares taken outside the premises also to be recorded with serial number of spare and in and out date and time. The Vendor shall provide replacement equipment if any equipment is out of the premises for repairs.

16. SHIFTING THE AC TO NEW LOCATION OR BRANCH:

18.1 If Bank desires to shift the AC to a new location/floor or department in the same premises or to another branch/office and install it thereof urgently, the Bank shall bear the charges for such shifting and the vendor shall dismantle and reinstall the AC as desired. The terms of this agreement, after such shifting to the alternate site and reinstallation thereof would continue to apply and binding on the vendor. The warranty terms would not be considered as violated due to the above shifting. The vendor, would not unreasonably assume that the causes lie with the shifting activity.

CONTRACTOR'S RESPONSIBILITY AFTER THE CONTRACT HAS EXPIRED

Successful bidder has to handover all the ACs in good running condition before expiring of CAMC contract. Security Deposit will be released only after verifying the same.

PENALTY CLAUSE FOR AMC:

Any penalty due during the Warranty/AMC period will be adjusted against the bills payable or retention money retained by the Bank as per following in case of non-satisfactory services provided under Warranty/AMC:

S. No.	Type of Defective Service	Penalty Amount / LD
1	Penalty for every air conditioner which is not repaired post completion of 72 hours of reporting the complaint till the day the complaint is rectified.	Rs 100/- per HP per day till the day of rectification
2	Penalty for every air conditioner that breaks down for more than three times in a month	Rs 500/- per HP per month
3	Penalty for not doing the Preventive Maintenance or Vendor does not fulfill the provisions of the contract in a quarter	only the proportionate maintenance charges for that period during the month will be considered payable by Bank without prejudice to the right of the Bank to terminate the contract.
4	Penalty for non-responsiveness to the calls of the Bank to repair or replace the faulty AC. If the vendor could not resolve the issues or not showing any interest to resolve the issue or non-responsive to Bank's calls	Bank will arrange to rectify the same through any other agency and recover the losses from the vendor by suitable deductions from the bills payable to the vendor or from the Security Deposit and contract cancelled.
5	Penalty for losses to Bank's property while performing the PM or repair works on account of any negligence, mishandling, non-adherence to the required safety protocols, commission or omission by the technicians of the Vendor and if any loss or damage caused to the Equipment or any Bank's property	Contractor to rectify or shall make good of the losses suffered by the Bank or Bank will recover the actual amount incurred by Bank

2. If, in any quarter, the invoice was paid to the Vendor without deducting the penalty or LD, the Bank can deduct the same from future payments payable or the Vendor shall refund the amount forthwith to Bank on demand by Bank.

3. Further Bank reserves the right to terminate the contract at any time during the validity of the Contract period by giving 30 days' notice to the Contractor with or without any reason.

6. No term or provision hereof shall be deemed waived and no breach excused, unless such waiver or consent shall be in writing and signed by the party claimed to have waived or consented. Any consent by any party to or waiver of a breach by other, whether express or implied, shall not constitute a consent to or waiver of or excuse for another different or subsequent breach.

Date:

Place:

Signature and seal of the Bidder