

NIT NO	HYD201911416
DATE	13.11.2019



**SBI INFRA MANAGEMENT SOLUTIONS PVT LTD  
(WHOLLY OWNED SUBSIDIARY OF SBI)**

**TENDER DOCUMENT FOR**  
**HVAC (AIR CONDITIONING) WORKS OF MAIN BRANCH,**  
**KHAMMAM, TELANGANA**  
**THROUGH E-TENDERING PROCESS**

**Manufacturers / approved dealers of (O-General, Daikin, Carrier, Blue Star, Mitsubishi Heavy, Hitachi & LG) are eligible to apply, Proof of dealership to be submitted**

**LETTER OF AUTHORISATION FROM MANUFACTURER TO PARTICIPATE IN THIS TENDER SHOULD BE ENCLOSED**

**Part-01: TECHNICAL BID**

**Note: Firm should possess valid digital signature for this e-tender.**

**Contractor has to provide their E- MAIL id &Contact No:**

**Email:** **Contact No:**

**For submission of Sealed Tender: 3:00PM on 20.11.2019**

**Opening of Sealed Tenders: 3:10 PM on 20.11.2019**

**M/S abhikram-s**  
**#3-6-134 FLAT NO 302**  
**SVC ROYAL DM APARTMENTS**  
**STREET NO 18, HIMAYATNAGAR**  
**HYDERABAD-29 Ph. no 040-23261158**  
**abhikramarchitects@gmail.com**

**The Vice president,**  
**SBI Infra Management Solutions Pvt. Ltd.**  
**Ground floor, Beside Commercial Branch,**  
**SBI LHO Campus, Bank Street, Koti,**

**NOTICE INVITING TENDER (NIT)****NAME OF WORK: e-TENDER Notice for AIR CONDITIONING WORKS FOR MAIN BRANCH (RENOVATION), KHAMMAM, TELANGANA**

Online tenders are invited for the above mentioned work in TWO BID SYSTEM from the Manufacturers / approved dealers of reputed AIR CONDITIONING brands and executed similar works is only eligible to apply

<b>1</b>	Name of the work	<b>E-Tender Notice for AIR CONDITIONING WORKS FOR MAIN BRANCH, KHAMMAM, TELANGANA</b>
<b>2</b>	Estimated cost	<b>Rs.15.19 Lakhs plus GST</b>
<b>3</b>	Cost of Tender Documents	<b>Rs.3000/-</b> to be paid through <b><u>State Bank Collect ONLY</u></b> as detailed under; 1) login <a href="https://www.onlinesbi.com">https://www.onlinesbi.com</a> 2) Select SB Collect from Top Menu, click the check box and "Proceed" 3) Select "All India" in "State of Corporate/Institution" & Select "Commercial Services" in "Type of Corporate/Institution" then "Go" 4) Select "SBI Infra Management Solutions Pvt. Ltd" in Commercial Services Name and "Submit" 5) Select "Tender Application Fee" in "Payment Category" and enter the "Tender ID" exactly as given in first page top of this tender(characters in uppercase only). 6) Fill up all fields such as email, GST No., Mobile No, Vendor/Firm Name etc and make payment. 7) Enclose payment receipt having unique reference No. along with EMD
<b>4</b>	Quantum of Earnest Money Deposit (EMD)	<b>Rs.16,000/- DD Drawn In Favor of SBI Infra Management Solutions Pvt. Ltd, Hyderabad Payable at Hyderabad</b>
<b>5</b>	Date and Time where tender forms are available	<b>Up to 20.11.2019, 3:00PM</b> at <a href="https://sbi.co.in/portal/web/home/procurement-news">https://sbi.co.in/portal/web/home/procurement-news</a> and <a href="https://etender.sbi">https://etender.sbi</a>
<b>6</b>	Last date and time of submission of online Tender	<b>20.11.2019 Up to 3:00PM</b> The tender has to be submitted to <b>THROUGH E-TENDERING PROCESS E-Procurement Technologies Ltd.</b> Executive. Ph: <b>9081000427, 9904407997</b> <b>E-mail: Sujith Nair:- 079-68136857, <a href="mailto:sujith@eptl.in">sujith@eptl.in</a></b> <b>Nadeem Mansuri:- 68136853, <a href="mailto:nadeem@eptl.in">nadeem@eptl.in</a></b> <b>Jaymeet Rathod:-68136829, <a href="mailto:jaymeet.rathod@eptl.in">jaymeet.rathod@eptl.in</a></b> <b>Vinayak Khambe:- 68136835, <a href="mailto:vinayak.k@eptl.in">vinayak.k@eptl.in</a></b>
<b>7</b>	Place, date & time for submission of e tender Contact person /telephone no/email address.	a) On line submission up to <b>20.11.2019, 3:00PM</b> at <a href="https://etender.sbi">https://etender.sbi</a> b)EMD & Payment Receipt for Tender document Cost are submission to Address: <b>The Vice president, SBIIMS Pvt. Ltd.</b>

		<b>Ground Floor, Beside Commercial branch, SBI LHO Building, Bank Street, Koti, Hyderabad – 95</b> <b>On or before 20.11.2019 by 3.00 P.M.</b> Vice President. 040- 23466346. <a href="mailto:vg.reddy@sbi.co.in">vg.reddy@sbi.co.in</a>
8	Date, Time and Place of opening of eTenders	<b>On 20.11.2019 at 3:10PM</b> The Vice president, SBIIMS Pvt. Ltd. Ground floor, Beside Commercial Branch, SBI LHO Building, Bank Street, Koti, Hyderabad – 95
9	Quantum of Security Deposit (percentage)	1. Initial Security Deposit (ISD) – 2% of the Tender value including EMD 2. Retention Money- Deductable in running bills@ 10% of the value of work and Total deductible is 5% of value of work including EMD, ISD.
10	Terms of payment of Bills, if any (specify the minimum value of work for payment of running account bills)	No Advance will be paid. Onetime payment i.e. the final payment will be made after completion of the entire work and certification by the official concerned.
11	Stipulated time for completion of the Work/ supply.	<b>Two (2) Months</b> from the date of the work order issued to the contractor.
12	(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.
13	Validity period of the tender.	<b>Three (3) Months</b>
14	Defect Liability Period	<b>Twelve (12) Months</b>
15	Check list of documents to be uploaded	<b>Page No 9 of 47</b>
16	Eligible Taxes	<b>A )</b> Income Tax will be deducted at source as per Govt. Guidelines. <b>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;</b> <ol style="list-style-type: none"> <li>1. Contractor should have GST Registration Number</li> <li>2. Invoice should specifically/separately disclose the amount of GST levied at applicable rate as per GST provision</li> <li>3. In case of Correction in the bills after scrutiny, contractor should submit fresh bills for payment</li> <li>4. Contractor should timely file his GST return in accordance with GST provisions to enable the</li> </ol>

		<p>bank to claim the credit of GST paid to the contractor</p> <p>5. The GST Number of State Bank Of India are For Telangana State -36AAACS8577K1ZQ</p>
16	Electronic Payment	<p>Payment shall be made by way of Electronic fund transfer and the bill will be <b>paid by the Branch</b>.</p> <p>Firm should furnish details of the bank, a/c no, IFSC code</p>
17	Agency for arranging online bidding	<p>M/s e-procurement Technologies limited, Ahmedabad.</p> <p>E-tendering guidelines may be obtained from Executive. Ph: <b>9081000427, 9904407997</b></p> <p><b>E-mail: Sujith Nair:- 079-68136857, <a href="mailto:sujith@eptl.in">sujith@eptl.in</a></b></p> <p><b>Nadeem Mansuri:- 68136853, <a href="mailto:nadeem@eptl.in">nadeem@eptl.in</a></b></p> <p><b>Jaymeet Rathod:-68136829, <a href="mailto:jaymeet.rathod@eptl.in">jaymeet.rathod@eptl.in</a></b></p> <p><b>Vinayak Khambe:- 68136835, <a href="mailto:vinayak.k@eptl.in">vinayak.k@eptl.in</a></b></p>
18	Any additional Information	<p>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</p>

- Entire tender document, which is downloaded from the website need to be uploaded, failing which tender summarily rejected
- Scanned copy of Tender cost and EMD must be uploaded and physically the same needs to be submitted at given address within due date of tender
- The SBIIMS reserves the right to cancel or postpone the tenders at any stage without assigning any reason.
- Scan copy of valid dealership certificate should be uploaded, failing which tender summarily rejected
- Scan copy of authorization letter from manufacturer to be uploaded
- Scan copy of completion certificate of similar works
- Firm should be visit the website till last date of submission for changes/ corrigendum if any
- Tender documents found partly or fully modified / altered/ corrected etc shall stand summarily rejected
- The make of materials should be chosen strictly from the approved makes as given in the tender. Using of the multi brands is not permissible. Single brand should be used for entire project.
- ANY CLARIFICATIONS SOUGHT AFTER OPENING OF THE TENDERS WILL NOT BE ENTERTAINED AT ANY COST.

**VICE PRESIDENT,  
SBIIMS PVT. LTD**

## INSTRUCTIONS TO TENDERERS

Online, e tenders are invited in Two bid for **AIR CONDITIONING WORKS for MAIN BRANCH, KHAMMAM, TELANGANA** from Manufacturers / approved dealers of reputed AIRCONDITIONING brands is only eligible to apply.

1. Submission of BIDs/Tender Documents: Tenders should be submitted online in the website <https://etender.sbi>. In addition, scanned copy of the declaration given in **page no 68 of 70** to be signed with seal, scan and submit online with our service provider on the website at: <https://etender.sbi>. The tender document is not required to be sent to us in hard copy. The Tender documents with acceptance of all terms and conditions strictly as described in this tender document will be submitted online through M/s e-Procurement Technologies Ltd., Ahmadabad, the out sourcing agency approved by the Bank for e-tendering on the website <https://etender.sbi>.
2. Contractors should submit/sent **EMD and Payment for Receipt of Cost of tender document physically on or before 20.11.2019 3.00p.m, to** the office of the The Sr Vice President, SBIIMS Pvt. Ltd, Ground Floor, Beside Commercial branch, LHO Building, Bank Street, Koti, Hyderabad- 500095. The tender will be rejected if the tenderer fails to submit the above documents such as soft copy of complete tender documents, scanned copies of Dealership certificate, declaration, EMD and Cost of tender document.
3. Contract documents consist of detailed plans, technical specification, schedule of quantities of the various classes of work to be done, and the set of 'conditions of contract' to be compiled with by the person whose tender may be accepted. The documents are available in the website <https://sbi.abcpocure.com>
4. Tenders should be submitted online **20.11.2019 up to 3.00 pm. The eTender will be opened on to 20.11.2019 at 3.30 pm.** The committee constituted for the purpose shall scrutinize the documents furnished in envelope-1, and pre-qualify suitable contractors. The price bid of the pre-qualified contractors shall alone be opened and the date and time shall be intimated separately. The decision of the committee regarding pre-qualification of contractors shall be final.
5. **EMD amount to Rs 16,000/-** to be deposited in the form of Demand Draft/ Banker's Cheque drawn in favor of "**SBI Infra Management Solutions Pvt. Ltd, Hyderabad**", otherwise the tender is liable for rejection. However, those who submitted one time EMD need not submit EMD again. Tender Cost **Rs 3,000/-** must be paid through SBI Collect only. Payment receipt must be enclosed along with EMD and submit at out office on or before **20.11.2019 3:00PM**.
6. The successful tenderer will have to pay an amount of Initial **Security Deposit**, which shall be 2% of the accepted value of the tender excluding the EMD, by means of D.D. in favor of the **Regional Manager, Warangal Urban, Payable at Warangal** and EMD will be refunded by SBI Infra Management Solutions Pvt. Ltd after deposit of ISD. The Initial security deposit is to be paid by the Contractor to Bank within 15 days of intimation to him of the acceptance of the tender. No interest is allowed on the above said security deposit(EMD, ISD)

7. Retention Money: From each running bill, an amount at the rate of 5% of the gross value of the running bill shall be recovered as retention money, till the total retention amount including the ISD amount already with the Bank become 5% of the value of the contract amount. This amount is called as Total Security Deposit, which consists of two components
- a) ISD - Initial Security Deposits.
  - b) RM - Retention Money.
- The total security deposit will be kept with the Bank. The total security deposit amount shall be refunded without interest to the contractor 15 days after the end of **defects liability period (one year)**, provided he has satisfactorily carried out all the works and attended to rectification of all defects in accordance with the conditions of the contract. In case of failure on the part to do so, the cost of rectifying the defects through any other agency shall be deducted from the amount of security deposit due to the contractor.
8. Completion of work:
- i) The work shall be considered as complete only when the certificate of virtual completion is issued by the architects/Bank.
  - ii) The 'defects liability period' as prescribed in the contract shall commence only from date of such virtual completion and the Contractor's removal of his materials, equipment, labour force, temporary sheds, stores, site office etc.
  - iii) Any defect that may appear within the defects liability period shall be rectified by the contractor within reasonable time on receipt of necessary instructions from Bank to that effect.
9. The acceptance of a tender will rest with the Competent Authority, who does not bind himself to accept the lowest tender and reserves to himself the authority to reject any or all of the tenders received, without assigning any reasons. All tenders in which any of the prescribed conditions are not fulfilled, or are incomplete in any respect are liable to be rejected.
10. All compensation or other sums of money payable by the Contractor to 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 7 days of being asked to do make good in by DD any sum which have been deducted from his security deposit.
11. Tender containing any condition leading to unknown / indefinite liability, are liable to be summarily rejected.
12. Canvassing in connection with tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection.
13. The tenderer should quote their (own) rates for undertaking the work.
14. GST as applicable will be reimbursed by Branch as specified in NIT.
15. All taxes other than GST, other statutory obligation in respect of this contract, as applicable, shall be payable by contractor including transportation and TA / DA of

the workers at site and the Bank will not entertain any claim whatsoever in this respect

16. I.T. will be recovered @ 2 % plus surcharge or as applicable as per Government Rules
17. Time is the essence of the contract. The work should be completed in **Two (2) Months** from the date of the work order issued to the contractor to commence the work. The successful Contractor will have to give CPM/PERT chart of various activities of works to be done so that the work gets completed within the stipulated time. The chart shall be submitted within 7 days from the date of acceptance of the tender.
18. Tenders for works shall remain open for acceptance for a period of 90 days from the last date of tenders. If the tenderer withdraws his tender before the expiry of the said period or makes any modifications in terms and condition of the tender which are not acceptable to the Bank, then the bank without prejudice to any other right or remedy is at liberty to forfeit the earnest money.
19. The successful tenderer, after the work is awarded, he will have to enter into an agreement with the competent authority of the bank.
20. The tenderer, must co-ordinate with the other agencies such as (I) Interior (II) Electrical etc.
21. The tenderer should visit the site to ascertain the working conditions and local authority regulations / restrictions if any and other information required for the proper execution of the work.
22. The work may be carried out on any floor level as per site condition. Please note that materials and machines are required to be carried on head load and the same must be accounted in the costing. Please note that no separate cost shall be allowed for head load.
23. The quantities of various items given in the schedule of quantities are approximate. The quantities of work may vary at time of allotment / execution of work. Bank reserves the right to omit / delete any item(s) of work from the schedule at the time of allotment / before. Contractor will be paid for the actual work done at the site duly verified by the concerned official of the bank.
24. The unit price shall be deemed to be fixed price. In case of extra items, a record of labour charges paid shall be maintained and shall be presented regularly to the Employer's for checking. The settlement will be made based on figures arrived at jointly and taking unit price given in the contract assigned to the successful Tenderer. In case of extra items where similar or comparable items are quoted in the tender, extra rates shall be based on tender rates.
25. If the rate quoted by the contractor for any item / items are not workable or abnormally lower than the market rate, the bank may demand Bank guarantee from the contractor for satisfactory completion of these work. The bank guarantee amount will be not less than 50% of the estimated amount of the items

for which the rates are not workable or abnormally low. This bank guarantee will be released after completion of these works (unworkable and abnormally low rated items) to the satisfaction of the bank.

26. The contractor shall submit the bar chart/ CPM/ PERT as well as shall submit the insurance cover for the work in the form of CAR policy and Third Party Insurance within **seven (7) days** from the acceptance of work order.
27. The work has to be started within 7 (Seven) Days from the date of receipt of work order/ mark out at site; whichever is later. In case of work not being started within this stipulated period, the bank reserves the right to cancel the work order duly forfeiting the Earnest money deposit
28. No employee of the Bank is allowed to work as a contractor for a period of 2 years of his/her retirement from Bank Services without previous permission of the Bank. This contract is liable to be cancelled, if either the contractor or any of his employees is any time to be such a person who had not obtained the permission of Bank as aforesaid before submission of the tender or engagement in the contractor's service.
29. Contractor should get approval of the samples of materials in advance with Bank's Engineer before use of the same in the work'
30. Bank has the right to offer the contractor to modify the old material wherever/ whenever necessary instead of new supplies
31. 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
32. The tenders shall summarily rejected, if any one of the above said requirements has not been complied with.
33. The Bank will not be bound to accept the lowest tender and reserves the right to accept or reject any or all the tenders without assigning any reason whatsoever
34. The contractor should fulfill the labour regulation guidelines stipulated by the governments
35. No advance payment in any form will be granted for the works proposed
36. Period of taking up the final bill will be one month from/ after satisfactory virtual completion or the date of submission of the final bill whichever is later.
37. Contractor is advised **not to engage child labour during the contract period**

**VICE PRESIDENT,  
SBIIMS PVT. LTD**

**READ, UNDERSTOOD AND ACCEPTED**



## **ELIGIBILITY CRIETERIA**

### **ELIGIBILITY OF INTENDING APPLICANTS FOR QUALIFICATION IN PARTICIPATION IN THE TENDER**

**Firms of repute having executed projects as mentioned below need only apply.**

Average annual financial turnover during the last 3 years ending 31<sup>st</sup> March 2019, should be at least **Rs 4.55 lacs**

And

Experience of having successfully completed similar works during the last 7 years ending 30-03-2019, should be either of the following:

a) THREE Similar works of each not less than **6.1 LAKHS**.

OR

TWO Similar works of each not less than **7.6 LAKHS**.

OR

One similar work not less than **12.15 LAKHS**

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**Similar work means “HVAC works of VRF / VRV is only considered”.**

**WORK COMPLETION CERTIFICATES OF SIMILAR WORKS ONLY WILL BE CONSIDERED. WORKORDERS WILL NOT BE ACCEPTED.**

GS T Registration certificate to be attached

**CHECKLIST OF DOCUMENTS TO BE UPLOADED**

1. Up load entire tender document in pdf format which is downloaded from <https://etender.sbi>
2. Signed and scanned copy of declaration
3. Scanned copy of letter of authorization from manufacturer to participate in the tender
4. Scanned copy of Valid dealership certificate
5. Scanned copy of completion certificate of similar works.
6. Scanned copy of Turn Over certificated audited by Chartered accountants
7. Scanned copy of DD/BC of EMD
8. Scanned copy of GST registration
9. Scanned copy of SBI Collect fee receipt

**FORM OF SUBMISSION OF TENDER**

(To be filled by the tenderer)

**The Vice president,  
SBI Infra Management Solutions Pvt. Ltd.  
Ground Floor, Beside Commercial branch, SBI LHO Building,  
Bank Street, Koti, Hyderabad – 500 095**

Dear Sir/s,

**Ref: TENDER FOR AIR CONDITIONING WORKS FOR MAIN BRANCH, KHAMMAM,  
TELANGANA**

I/We hereby declare that I/ We have carefully gone through the conditions laid down in the Notice Inviting Tender, General notes, General Conditions of Contract, Special conditions, Schedule of approximate quantities and rates, Form of Agreement, General Specification, Approved manufacturers/ natural source of materials Technical Specifications of schedule of quantities prepared by your Architects **M/S ABHIKRAM-S** and clearly understood all the same and on the basis of the same I/ We have quoted our rates in the Schedule of Quantities (i.e. BOQ) attached with the tender documents.

I / We do here by undertaken to execute and complete the whole or part of the work (as desired by you) at the respective rates quoted.

I/ We are depositing a sum of **Rs 3000/- (Rupees Three Thousand only)** towards cost of tender and **Rs.16,000/- (Rupees Sixteen Thousand Only )** as Earnest Money Deposit by way of demand draft drawn in favor of **SBI Infra Management Solutions Pvt. Ltd, Hyderabad**; along with this tender for due execution of the work at my/ our tendered rates.

In the event of this Tender being accepted I/ We agree to enter into the agreement and submit the declaration on requisite non-judicial stamp papers as and when required and execute the contract according to your form of Agreement etc., in default whereof, I/ We do hereby bind my-self / ourselves to forfeit the aforesaid deposit.

In the event of this Tender being accepted I/ We agree to obtain the labor license and the CAR and Third party insurance policy and deposit the balance E.M.D. amount and adhere/comply to all other instructions as given in TENDER DOCUMENT.

I / We further agree to complete the work included in the said schedule of quantities within **Two (2) Months** time from the date of the work order issued to commence the same. Date of commencement shall be either one week from the date of work order issued to the contractor or the date on which mark out of work at site has been given to contractor; whichever is later.

Signature of the Contractor

I / We agree not to employ sub-contractors other than those that may be approved by Employer.

I / We agree to pay all taxes(except GST), insurance charges as prevailing from time to time, on such items for whom same is to be levied by/ for the government, and the rates quoted by me / us are inclusive of all the same.

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.

Yours Faithfully,

Signature of Witness:

Contractor's Signature\_\_\_\_\_

1.

Name: \_\_\_\_\_

2.

Address: \_\_\_\_\_

3.

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## GENERAL NOTES

### 1. PROCEDURE OF FILLING AND SUBMISSION OF TENDER

- a) Submission of BIDs/Tender Documents: Tenders should be submitted online in the website <https://etender.sbi>. In addition, scanned copy of the declaration given in page no 43 of 49 to be signed with seal and scanned proof of valid dealership certificate should be submitted online with our service provider on the website at: <https://etender.sbi>. The tender document is not required to be sent to us in hard copy. The Tender documents with acceptance of all terms and conditions strictly as described in this tender document will be submitted online through M/s e-Procurement Technologies Ltd., Ahmadabad, the out sourcing agency approved by the Bank for e-tendering on the website <https://etender.sbi>
- b) In the event of the tender being submitted by a firm, it must be signed by a member or members of the firm having legal authority to do so, and if called for, the legal documents in support thereof must be produced for inspection and the same in the case of the firm carried out by one member of a joint family. It must disclose that the firm is duly registered under the India Partnership Act. Any tender signed by a member not holding a power of attorney shall be treated as invalid.
- c) Tenderer shall note that their tenders shall remain open for acceptance for a minimum period of three months from the last date of receipt of tenders. The tenders must be unconditional. Conditional tenders may be summarily rejected.

### 2. RATES TO INCLUDE:

While quoting their rates the tenderer should include the following if otherwise not stated herein before.

- a) Necessary cost of taking samples of materials supplied by them for work including plywood, wood/tiles etc., testing of the same at Govt.'s / approved laboratory including transportation, cost of the samples, as and when required.
- b) Submission of test reports of other materials as may be specified by Bank's Engineer.

### 3. STORAGE OF MATERIALS:

The contractor shall not store their materials and debris within the premises other than the work site handed over to him.

### 5. LABOUR HUTMENT:

Shelter or stay and other amenities for the labors have to be arranged by the contractor at his own expense and responsibility.

### 6. IDLE LABOUR:

In case the work is held up for any site conditions not attributable to the contractors or for any decisions instructions / want of details from Employer or for any of the conditions, the contractor shall be allowed reasonable extension of time by the employer but any claim for idle labour shall not be entertained by the employer. Contractor's quoted rates should include for all such contingencies.

7. The contractor shall engage one competent person at site who shall take the instructions from the Employer. The work should not suffer due to lack of supervision, manpower and materials.

Signature of the Contractor

**8.** The Contractor is required to co-ordinate his works along with other agencies working at site. He has to reimburse any of the damage made by him or any of his representatives for any of the other agency or owner at site.

**9.** Making of any cut-out / opening for electrical wiring / fitting in any of false ceiling, partition, Paneling, masonry work etc., and providing panels of the same finish in partitions, paneling shall not be paid extra.

**10.** The contractor is required to fabricate a sample where required, or any item so installed for approval. Any changes made by the Architect/Employer, in the sample to the specifications as mentioned in the tender, shall not be deducted or paid extra.

**11.** All measurements given in the schedule hereunder are for the purpose of tender only. Payment will be made on actual measurement of the work done

**12.** All measurements shall be as per relevant I.S. standards

## GENERAL CONDITIONS OF CONTRACT

Except where provided for in the description of the individual items in the schedule of quantities and in the specifications and conditions laid down hereinafter and in the drawings, the work shall be carried out as per standard specifications and under the direction of Employer.

### 1. INTERPRETATION

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

- a) **Employer:** The term employer shall denote **State Bank of India Infra Management Solutions Pvt. Ltd having office at LHO, Hyderabad, Bank Street, Koti, Hyderabad** and any of its employees representative authorized on their behalf.
- b) **Architects / Consultants:** The term Architects shall mean the said **M/S ABHIKRAM-S** Architects appointed by the employer for the purpose of preparing detailed drawing, supervision etc. It is the Bank to decide whether to appoint Architect or not and to change the Architect at any stage of work.
- c) **Contractor:** The term contractor shall mean \_\_\_\_\_ (Name and address of the contractor) and his / their heirs, legal representatives, assigns & successors.
- d) **Site:** The site shall mean the site where the works are to be executed, i.e. **SBI MAIN BRANCH, KHAMMAM, TELANGANA including** any building and erection thereon, allotted by the employer for the contractors use.
- e) **Site Engineer:** Any Engineer appointed from time to time by the Employer and certified in writing to the Architects and the Contractor, to be positioned at site to supervise the work.
- f) **Drawings:** The work is to be carried out in accordance with drawings, specifications, the schedule of quantities and any further drawings which may be supplied or any other instruction, which may be given by the Employer or Architects during the execution of the work.

All drawings relating to work given to the contractor together with a copy of schedule of quantities are to be kept at site and the Employer / Architects shall be given access to such drawings or schedule of quantities wherever necessary.

In case any detailed Drawings are necessary contractor shall prepare such detailed drawings and / or dimensional sketches therefore and have it confirmed by the Employer as case may be prior to taking up such work.

The contractor shall ask in writing for all clarifications on matters occurring anywhere in drawings, specifications and schedule of quantities or to additional instructions at least 10 days ahead from the time when it is required for implementation so that the Employer may be able to give decision thereon.

- **“The Works”** shall mean the work or works to be executed or done under this contract.
- **“Act of Insolvency”** shall mean any act as such as defined by the Presidency Towns Insolvency Act or in Provincial Insolvency act or any amending status.

- **“The Schedule of Quantities”** shall mean the schedule of quantities as specified and forming part of this contract.
- **“Priced Schedule of Quantities”** shall mean the schedule of quantities duly priced with the accepted quoted rates of the contractor.
- **“Contract”** shall mean the Articles of Agreement, the general conditions special conditions, the appendix, the schedule of quantities, specifications and drawings attached here to and duly signed.
- **‘Contract Price’** shall mean the sum named in the Tender subject to such additions thereto or deductions there from as may be made under the provisions hereafter contained.
- **‘Notice in Writing’** or written notice shall mean a notice in writing, type 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 addressee and shall be deemed to have been received when in the ordinary course of post it would have been delivered.
- **‘Net Prices’** any arriving at the Contract amount the Contractor shall have added to or deducted from the total of the items if the Tender any sum, either as a percentage or otherwise, then the net price of any item 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. Providing 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 hold to mean rates or prices so arrived at.
- **‘Virtual Completion’** shall mean the premise is in the opinion of the Employer fit for occupation.
- Words importing persons include firms and corporations. Words importing the singular only, also include the plural and vice verse where the Context requires.

## **2. SCOPE OF WORK/ CONTRACT**

The Brief Scope of work involves the following.

1. Main Panel Installation, DB installation, Ac wiring etc
2. Fan point wiring, light point wiring
3. Installation of switch boards, Light fixtures etc
4. Supply and installation of lights, fans

The Contractor shall carry out and complete the said work in every respect in accordance with this Contract and with the directions of and to the satisfaction of the Employer. The Architect with approval of Employer or Employer issue further drawings and/or written instructions, detailed directions and explanations which hereafter collectively referred to as ‘Instructions’ in regard to:

- The variation or modification of the design quality or quantity of works or the addition or omission or substitution of any work.



- Any discrepancy in the drawings or between the schedule of quantities and / or drawings and / or specification.
- The removal from the site of any defective material brought thereon by the contractor and the substitution of any other material thereof.
- The demolition removal and / or re-execution of any work executed by the contractor/s.
- The dismissal from the work of any persons employed there upon.
- The opening up for inspection of any work covered up.
- The rectification and making good of any defects under clauses hereinafter mentioned and those arising during the maintenance period (Defect Liability Period).

The contractor shall forthwith comply with and duly execute any work comprised in such Employer's or his agent / Architect's instructions, provided always that verbal instructions, directions and explanations given to the contractor's or his representative upon the works by the Employer's or his agent / Architects shall, if involving a variation, be confirmed in writing to the contractor/s within seven days. No works, for which rates are not specifically mentioned in the priced schedule of quantities, shall be taken up without written permission of the Employer. The employer as provided in clause "variation" shall fix rates of items not mentioned in the priced schedule of quantities.

Regarding all factory made products for which ISI marked products are available, only products bearing ISI marking shall be used in the work.

### **3. TENDERER SHALL VISIT THE SITE**

Intending tenderer shall visit the site and make himself thoroughly acquainted with the local site condition, nature and requirements of the works, facilities of transport conditions, effective labour and materials, access and storage for materials and removal of rubbish. The tenderer shall provide in their tender for cost of carriage, freight and other charges as also for any special difficulties and including police restriction for transport etc., for proper execution of work as indicated in the drawings. The successful tenderer will not be entitled to any claim of compensation for difficulties faced or losses incurred on account of any site condition.

### **4. TENDERS**

The Employer reserves the right to reject the lowest or any tender.

The tenderers should note that the tender is strictly on the item rate basis and their attention is drawn to the fact that the rates for each and every item should be correct, workable and self-supporting. If called upon by the Employer/Architects detailed analysis of any or all the rates shall be submitted. The Employer/Architects shall not be bound to recognize the contractor's analysis.

The works will be paid for as "measured work" on the basis of actual work done and not as "lump sum" contract, unless otherwise specified.

All items of work described in the schedule of quantities are to be deemed and paid as complete works in all respects and details including preparatory and finishing works involved, directly related to and reasonably detectable from the drawings, specifications and schedule of quantities and no further extra charges will be allowed in this connection. In the case of lump-sum charges in the tender in respect of any items of work will be made for the actual work done on the basis of lump sum charges as will be assessed to be payable by the Employer / Architects.

The employer has power to add, omit from any work as shown in drawings or described in specifications or include in schedule of quantities and intimate the same in writing but no addition, omission or variation shall be made by the contractor without authorization from the Employer. No variation shall vitiate the contract.

The tenderer shall note that his tender shall remain open for consideration for a period of three months from the date of opening of the tender.

#### **5. AGREEMENT**

The successful contractor will be required to sign agreement in accordance with the draft agreement enclosed and the schedule conditions. The contractor shall pay for all stamps and legal expenses, incidental thereto. However the written acceptance by the employer of a tender will constitute a binding contract between the employer and the person so tendering such formal agreement is subsequently executed.

#### **6. AUTHORITIES, NOTICES, PATENT RIGHTS AND ROYALTIES:**

The contractor shall conform to the provisions of any Acts of the Legislature relating to the work, and to the Regulations and Bye-Laws of any authorities, and / or any water, lighting and other companies, and / or authorities with whose systems the structures were proposed to have connection and shall before making any variations from the drawings or specifications that may be associated to so conform, give the Employer / Architects written notices specifying the variations proposed to be made and reasons for making them and apply for instruction thereon. The Employer / Architects on receipt of such intimation shall give a decision within a reasonable time.

The contractor/s shall arrange to give all notices required for by the said Acts, Regulations or Bye-laws to be given to any authority, and to pay to such authority or to any public officer all fees that may be properly chargeable in respect of the work and lodge the receipts with the Employer. The Contractor shall identify the Employer against all claims in respect of patent rights, designs, trademarks or name or the protected rights in respect of any constructional plant, machine, work or material used for or in connection with the 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 Employer/ Architects, before any such infringement and received their permission to proceed and shall himself pay all royalties, license fees, damages, coat and charges of all and every sort that may be legally incurred in respect thereof.

#### **7. TAXES AND DUTIES**

The tenderers must include in their tender prices quoted for all taxes(except GST) and duties royalties, cess ,local charges if applicable. No extra claim on this account will in any case be entertained.

#### **8. NOTICES AND STATUTORY REGULATIONS:**

The contractor shall give all notices and pay all fees and shall comply all Acts and Regulations for the successful completion of the contract works.

The whole of the work is to be complied with as per the requirements and bylaws of the relevant statutory authorities including contract labor (Regulation and Abolition) Act 1970.

#### **9. QUANTITY OF WORK TO BE EXECUTED**

The Schedule of Quantities unless otherwise stated shall be deemed to have been prepared in accordance with the Standard Procedure shall be considered to be approximate and no liability shall attach to the employer for any error may be discovered therein. The Employer reserves the right to execute only a part or the whole or any excess thereof without assigning any reason therefore.

The Contractor shall be deemed to have satisfied himself before tendering 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 completion of the works.

**10. OTHER PERSONS ENGAGED BY THE EMPLOYER**

The Employer reserves the right to execute any part of the work included in this contract or any work, which is not included in this contract by the other Agency, or persons and contractor shall allow all reasonable facilities and use of his scaffoldings for the execution of such work. The main contractor shall extend all cooperation in his regard.

**11. Tenderer should deposit EMD as mentioned in the NIT.**

**12. CONTRACTOR TO PROVIDE EVERYTHING NECESSARY**

The Contractor shall provide everything necessary for the proper execution of the work according to the intent and meaning of the drawings, schedule of quantities and specifications taken together whether the same may or may not be particularly shown or described therein provide that the same can reasonably be inferred there from and if the contractor finds any discrepancies therein he shall immediately and in writing , refer the same to the Employer / Architects whose decision shall be final and binding.

**13. TIME OF COMPLETION, EXTENSION OF TIME & PROGRESS CHART**

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 to complete the same. On or before the 'Day of Completion' stated in the Appendix subject nevertheless the provision for the extension of time hereinafter contained.

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

- a) By force major or
- b) By reason of any exceptionally inclement weather or
- c) By reason of proceedings taken or threatened by or dispute with adjoining or neighboring owners of public authorities arising, than through the Contractor's won default or
- d) By the works or delays of the contractors tradesmen engaged or nominated by the Employer / Architect and not referred in the Schedule of Quantities and / or specifications or
- e) By reason of civil, commotion, local combination of workmen or strike or lock-out effecting any of the buildings traders or
- f) In consequence of the Contractor not having in due time, necessary instructions from the Employer for which he shall have specifically applied in writing ahead of time, giving reasonable time to prepare such instructions, the employer shall make a fair and reasonable extension of time for completion of the Contract works

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

The Contractor on starting the works shall furnish to the Employer / Architect a PERT / CPM Program for carrying out the work stage in the stipulated time for the approval of Architect / Employer and follow strictly the approved time schedule incorporating charges if any, to ensure the completion of the work in stipulated time. A graph or chart on individual work shall be maintained showing the proportionate progress of work week by week a weekly progress report stating the number of skilled and un skilled laborers employed on the work, working hours done, place, type, and quantity of work done during the period.

The Contractor must inform the employer within 10 days in advance of all drawings and detailed required by him from time to time. The Contractor shall adhere to the approved program and arrange for the materials and labour etc accordingly.

Despite repeated instructions, if the Contractor fails to show proportionate progress of the work, the Architect / Employer may take suitable action and deemed fit without prejudice to any terms and conditions of the contract

#### **14. LIQUIDATED DAMAGES**

Should the work be not completed to the satisfaction of the Employer /Architects within the stipulated period, the contractor shall be bound to pay to the Employer a sum calculated as given below by way of liquidated damages and not as penalty during which the work remains un-commenced or unfinished after the expiry of the completion date.

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 0.5% of contract amount for each week beyond the date that the work remains incomplete subject to maximum of 5%of the contract value (without extra items).

#### **15. MATERIALS, WORKMANSHIP, SAMPLES, TESTING OF MATERIALS.**

All the works specified and provided for in the specifications or which may be required to be done in order to perform and complete any part thereof shall be executed in the best and most workmanlike manner with materials of the best and approved quality of the respective kinds in accordance with the particulars contained in and implied by the specifications and as represented by the drawings or according to such other additional particulars, and instructions as may from time to time be given by the Employer / Architects during the execution of the work and to his entire satisfaction.

All mandatory tests shall be carried out as per CPWD specifications. If required by the Employer / Architects, the contractor shall have to carry out tests on materials and workmanship in approved materials testing laboratories or as prescribed by the Employer / Architects at his own cost to prove that the materials etc., under test conform to the relevant I.S Standards or as specified in the specifications. The necessary charges, transporting, testing etc., shall have to be borne by the contractor. No extra payment on this account should in any case be entertained.

All the materials (except where otherwise described) stores and equipment required for the full performance of the work under the contract must be provided through normal channels and must include charges for import duties, and other charges and must be the best of their kind available and the contractors must be entirely responsible for the proper and efficient carrying out of the work. The work must be done in the best workmanlike manner. **Samples of all materials to be used must be submitted to the Employer when so directed by the Engineer and written approval from Employer must be obtain prior to placement of order.**

Any damage (during the work) to any part of the work or to the premises for any reasons due to rain, storm or neglect of contractor shall be rectified by the contractor in an approved manner at no extra cost.

Should the work be suspended by reason of rain, strike, lock-outs or any other cause, the contractor shall take all precautions necessary for the protection of work and at his own expenses shall make good any damage arising from any of these causes.

The contractor shall cover up and protect from damage, from any cause, all new work and supply all temporary doors, protection to windows, and any other requisite protection for the execution of the work whether by himself or special tradesmen or sub-contractor and any damage caused must be made good by the contractor at his own expenses.

Contractor should take all precaution to safeguard the flooring and if any damages to the flooring should be rectified by the contractor in the same quality at his own cost.

## **16. REMOVAL OF IMPROPER WORK**

The Employer shall during the progress of the work have power to order in writing from time to time the removal from the work within such reasonable time or times as may be specified in the order of any materials which in the opinion of the Employer / Architects are not in accordance with specification or instructions, the substitution or proper re-execution of any work executed with materials or workmanship not in accordance with the drawings and specifications or instructions. In case the contractor refuses to comply with the order the Employer shall have the power to employ and pay other agencies to carry out the work and all expenses consequent thereon or incidental thereto as certified by the Employer / Architects shall be borne by the contractor or may be deducted from any money due to or that may become due to the contractor. No certificate, shall relieve the contractor from his liability in respect of unsound work or bad materials.

## **17. SITE ENGINEER**

The Employer may appoint a Site Engineer or clerk of works who shall be representative of the Employer. The duties of the Employer representative are to watch and supervise the works and to test any materials to be used 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 the measuring time 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 day-work, additions, alterations, deviations or omissions unless such an authority may be specially conferred by a written order of the Employer.

The Employer's Representative shall have to give notice to the Contractor or his foremen about the non-approval of any work or materials and such works shall be suspended or the use of such material should be discontinued until the decision of the employer/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 defects which may be found to exist at any stage of the work of after the same is completed. Subject to the limitations of this cause, the Contractor shall take instruction from the Architect / Employer.

## **18. CONTRACTOR'S EMPLOYEES**

The Contractor shall employ technically qualified and competent supervisors for the work who shall be available (by turn) throughout the working hours to receive and comply with instructions of the Employer / Architects. The contractor shall engage at least one experienced Engineer as site-in-charge for execution of the work. The contractor shall employ in connection with the work persons having the appropriate skill or ability to perform their job efficiently.

The contractor shall not employ labour below the age of sixteen years and who is not an Indian National.

Any laborer supplied by the contractor to be engaged on the work on day work basis either wholly or partly under the direct order or control of the Employer or his representative shall be deemed to be a person employed by the contractor.

## **LOCAL LAWS, ACTS, REGULATIONS**

The contractor should abide by the central labour regulation and also shall strictly adhere to all prevailing labour laws inclusive of contract labour (Regulation and abolition act of 1970) and other safety regulations. The agency shall comply with the provision of all

labour legislation including the latest requirements of all the acts, laws, any other regulations that are applicable to the execution of the tests.

- Minimum wages act, 1948 (Amended)
- Payment of wages act, 1936 (Amended)
- Workmen's compensation act 1923 (Amended)
- Contract labour Regulation and Abolition act 1970 and Central rules 1971 (Amended)
- Chief Labour Commissioner( C) , Ministry of Labour & Employment vide Gazette notification No.F.No.1/13(3)/2017-LS-II dated 20th April 2017 on minimum wages
- Apprentice act 1961 (Amended)
- Industrial employment (Standing order) Act 1946 (Amended)
- Personal injuries (compensation insurance ) Act 1963 and other modifications
- Employees' Provident Fund and Miscellaneous Provisions Act 1952 and amendment thereof
- Shop and Establishment Act
- Employer's Liability Act.
- Any other Act or enactment thereof and rules framed there under from time to time.

The contractor shall keep the Employer saved harmless and indemnified against claims if any of the workmen and all costs and expenses as may be incurred by the Employer in connection with any claim that may be made by any workmen.

The contractor shall comply at his own cost with the order for requirement of any Health Officer of the State or any local authority or of the Employer regarding the maintenance of proper environmental sanitation of the area where the contractor's laborers are housed or accommodated, for the prevention of small pox, cholera, plague, typhoid, malaria and other contagious diseases. The contractor shall provide, maintain and keep in good sanitary condition adequate sanitary accommodation and provide facilities for pure drinking water at all times for the use of men engaged on the works and shall remove and clear away the same on completion of the works. Adequate precautions shall be taken by the contractor to prevent nuisance of any kind on the works or the lands adjoining the same.

The contractor shall arrange to provide first aid treatment to the laborers engaged on the works. He shall within 24 hours of the occurrence of any accident at or about the site or in connection with execution of the works report such accident to the Employer and also to the competent Authority where such report is required by law.

## **19. DISMISSAL OF WORKMEN**

The contractor shall on the request of the Employer immediately dismiss from works any person employed thereon by him, who in the opinion of the Employer be unsuitable or incompetent or who may misconduct him. Such discharges shall not be the basis of any claim for compensation or damages against the Employer or any of their officer or employee.

## **20. ASSIGNMENT**

The whole of 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 or interest therein nor, shall take a new partner, without written consent of the Employer and no subletting shall relieve the contractor from the full and entire responsibility of the contract or from active superintendence of the work during their progress

## **21. INSURANCE & DAMAGE TO PERSONS AND PROPERTY ETC.**

The contractors under the terms of the contract are required to keep the works duly insured under CAR Policy(Contractor All Risk Policy) as well as third Party Insurance for the value of 110% of the Project value or Tender value until the Completion of the project or handing over whichever is later. The insurance policies should be taken in the joint names by the contractors and the same should be renewed at appropriate time.

The contractor shall be responsible for all injury to the work or workmen to persons, animals or things and for all damages to the structural and / or decorative part of property which may arise from the operations or neglect of himself or of any sub-contractor or of any of his or a sub-contractor's employees, whether such injury or damage arise from carelessness, accident or any other cause whatsoever in any way connected with the carrying out of this contract. The clause shall be held to include inter-alia, any damage to buildings whether immediately adjacent or otherwise, and any damage to roads, streets, foot paths or ways as well as damages caused to the buildings and the works forming the subject of this contract by rain, wind or other inclemency of the weather. The contractor shall indemnify the Employer and hold harmless in respect of all and any expenses arising from any such injury or damages to the person or property as aforesaid and also in respect of any claim made in respect of injury or damage under any acts on compensation or damage consequent upon such claim.

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

The contractor shall affect the insurance necessary and indemnify the Employer entirely from all responsibility in this respect. must be effected jointly in the name of the Employer and contractor and the policy lodged with the Employer. The scope of insurance is to include damage or loss to the contract itself till this is made over in a complete state. Insurance is compulsory and must be affected from the very initial stage. The contractor shall be responsible for anything, which may be excluded from damage to any property arising out of incidents, negligence or defective carrying out of this contract.

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

## **22. MEASUREMENTS**

Before taking any measurement of any work the Site Engineer or employer's representative shall give reasonable notice to the contractor. If the contractor fails to attend at the measurements after such notice or fails to countersign or to record the difference within a week from the date of measurement in the manner required by Site Engineer or by the subordinate deputed by him as the case may be is final and binding on the contractor and contractor shall have no right to dispute the same.

The Employer / Architect shall issue a certificate after due scrutiny of the contractor's bill stating the amount due to the contractor from the Employer and the contractor shall be entitled to payment thereof, within the period of honoring certificates named in these documents.

## **23. PAYMENTS**

All bills shall be prepared by the contractor in the form prescribed by the Employer's / Architects. Normally one interim bill shall be prepared each month subject to minimum value as stated in these documents.

The bills in proper forms must be duly accompanied by detailed measurements in M-book in support of the quantities of work done and must show deductions for all previous payments, retention money, etc.

The Architect shall issue a certificate after due scrutiny of the contractor's bill stating the amount due to the contractor from the Employer and the contractor shall be entitled to payment thereof, within the period of honoring certificates named in these documents.

The Employer will deduct IT, other applicable taxes if any (but GST is reimbursable) and retention money as described in this document. The refund of retention money will be made as specified.

If the Employer has supplied any materials or goods to the contractor, the cost of any such materials or goods will be progressively deducted from the amount due to the contractor in accordance with the quantities consumed in the work.

All the interim payments shall be regarded as payments by way of advance against the final payment only and not as payments for work actually done and completed, 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 or be considered as an admission of the due performance of the contract, or any part thereof in any respect or the accruing of any claim, nor shall it conclude, determine or affect in any way the power of the Employer under these conditions or any of them as to the final settlement and adjustment of the accounts or otherwise or in any other way vary or affect the contract. The final bill shall be submitted by the contractor within one week of the date fixed for completion of the work or of the date of certificate of completion and payment shall be made within one month from the date of receipt of the bill.

### **Final Payment**

The final bill shall be accompanied by a certificate of completion from the Architects. Payments of final bill shall be made after deduction of Retention Money as specified, which shall be refunded after the completion of the Defects Liability Period after receiving the Branch Manager/Engineer's certificate that the contractor has rectified all defects to the satisfaction of the Employer. The acceptance of the payment of the final bill by the contractor would indicate that he has no further claim in respect of the work executed.

### **24. VARIATION / DEVIATION**

The tender rates shall be fixed and applicable for any increase or decrease in the tendered quantities. The Employer / Architect can increase or decrease any quantities to any extent or even delete particular item as per the site requirements and the contractor shall not be paid anything extra on this account. Nothing extra will be paid by the Bank on account of omission / deletion of items or decrease in the quantity of items. The Bank shall not entertain any claim whatsoever from the contractor on this account.

The price of all additional items/non-tendered items will be worked out on the basis of rates quoted for similar items in the contract wherever existing. If similar items are not available, the rates for such items will be derived as per standard method of rate analysis based on prevalent fair price of labour, material and other components as required with 15% towards contractor's profit and overheads.

### **25. SUBSTITUTION**

Should the contractor desire to substitute any materials and workmanship, he/they must obtain the approval of the Employer/ Architects in writing for any such substitution well in advance. Materials designated in this specification indefinitely by such term as "Equal" or "Other approved" etc. specific approval of the Employer / Architect has to be obtained in writing.



## **26. CLEARING SITE ON COMPLETION**

On completion of the works the contractor shall clear away and remove from the site all machinery, surplus materials, rubbish and temporary works of every kind and leave the whole of the site and the works clean and in a workmanlike condition to the satisfaction of the Employer/Architects.

## **27. DEFECTS AFTER COMPLETION**

The contractor shall make good at his own cost and to the satisfaction of the Employer all defects, which may appear within 12 months after completion of the work. In the default, the Employer may employ and pay other persons to amend and make good such damages, losses and expenses consequent thereon or incidental thereto shall be made good and borne by the contractor and such damages, loss and expenses shall be recoverable from him by the Employer or may be deducted by the employer, in lieu of such amending and making good by the contractor, deduct from any money due to the contractor a sum equivalent to the cost of amending such work and in the event of the amount retained being insufficient recover that balance from the contractor from the amount retained (retention money) together with any expenses the Employer may have incurred in connection therewith.

## **28. CONCEALED WORK**

The contractor shall give due notice to the Employer/Architects whenever any work is to be covered up or finished up or otherwise becoming inaccessible later on, in order that the work may be inspected and correct dimensions taken before such covering, in default whereof the same shall, at the opinion of the Employer/ Architect be either opened up for measurement at the contractor's expenses or no payment may be made for such materials. Should any dispute or differences arise after the execution of any work as to measurements etc., or other matters which cannot be conveniently tested or checked, the notes of the Employer / Architects shall be accepted as correct and binding on the contractor.

## **29. IDLE LABOUR**

Whatever the reasons may be, no claim for idle labor, additional establishment cost of hire and labor charges of tools and plants would be entertained under any circumstances.

## **30. SUSPENSION OF WORKS**

If the contractor except on account of any legal restraint upon the Employer preventing the continuance of the work or in the opinion of the Employer 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, the Employer shall have the power to give notice in writing to the contractor requiring the work to be proceeded within a reasonable manner and with reasonable dispatch, such notice purport to be a notice under this clause.

After such notice shall have been given, the contractor shall not be at liberty to remove from the site of the works or from any ground contiguous thereto any plant or materials to subsist from the date of such notice being given until the notice shall have been complied with. If the contractor fails to start the work within seven days after such notice has been given to proceed with the works as therein prescribed, the employer may proceed as provided in clause 31 (Termination of Contract by Employer)

## **31. TERMINATION OF CONTRACT BY EMPLOYER**

If the contractor being a company go into liquidation whether voluntary or compulsory or being a firm shall be dissolved or being an individual shall be adjudicated insolvent or shall make an assignment or a composition for the benefit of the greater part, in number

of amount of his creditors or shall enter into a Deed or arrangement with his creditors, or if the Official Assignee in insolvency, or the Receiver of the contractor in insolvency, shall repudiate the contract, or if a receiver of the contractor's firm appointed by the court shall be unable within fourteen days after notice to him requiring him to do so, to show to the reasonable satisfaction of the employer that he is able to carry out and fulfill the contract, and if so required by the employer to give reasonable security therefore, or if the contractor shall suffer execution to be issued, or shall suffer any payment under this contract to be attached by or on behalf of and of the creditors of the contractor, or shall assign, charge or encumber this contract or any payments due or which may become due to contractor, there under, or shall neglect or fail to observe and perform all or any of the acts matters of things by this contract, to be observed and performed by the contractor within three clear days after the notice shall have been given to the contractor in manner hereinafter mentioned requiring the contractor to observe or perform the same or shall use improper materials of workmanship in carrying on the works, or shall in the opinion of the employer not exercise such due diligence and make such progress as would enable the work to be completed within due time agreed upon, and shall fail to proceed to the satisfaction of the employer after three clear das notice requiring the contractor so to do shall have been given to the contractor as hereinafter mentioned or shall abandon the contract, then and in any of the said cases, the Bank may notwithstanding previous waiver determine the contract by a notice in writing to the effect as hereinafter mentioned, but without thereby effecting the powers of the employer of the obligations and liabilities of the contractor the whole of which shall continue in force as fully as if the contract, had not been so determine and as if the works subsequently executed by or on behalf of the contractor (without thereby creating any trust in favor of the contractor) further the employer or his agent, or servants, may enter upon and take possession of the work and all plants tools scaffolding sheds machinery, steam, and other power, utensils and materials lying upon premises or the adjoining lands or roads and sell the same as his own property or may employ the same by means of his own servants and workmen in carrying on and completing the works or by employing any other contractors or other persons or person to complete the works, and the contractor shall not in any way interrupt or do any act, matter or thing to prevent or hinder such other contractors or other persons or person employed from completing and finishing or using the materials and plants for the works when the works shall be completed, or as soon thereafter as conveniently may be the employer shall give notice in writing to the contractor to remove his surplus materials and plants and should the contractor to remove his surplus materials after receipt by him the employer may sell the same by Public Auction and shall give credit to the contractor for the amount so realized. Any expenses or losses incurred by the contractor for the amount so realized. Any expenses or losses incurred by the employer in getting the amount payable to the contractor by way of selling his tools and plants or due on account of work carried out by the contractor prior to engaging other contractors or against the Security Deposit.

### **32. ARBITRATION**

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 effect thereof or to the rights or liabilities of the parties or arising out of or in relation thereto whether during or after determination foreclosure or breach of the contract (other than those in respect of which the decision of any person is by the contract expressed to be final and binding) shall after written notice by either party to the contract to the other of them and to the Employer hereinafter mentioned be referred for adjudication to a sole Arbitrator to be appointed as hereinafter provided.

For the purpose of appointing the sole Arbitrator referred to above, the Employer will send within thirty days of receipt of the notice, to the contractor a panel of three names of

persons who shall be presently unconnected with the organization for which the work is executed from the following categories of Arbitrators”:-

- a) Retired High Court/Supreme Court judge who have experienced in handling Arbitration Cases.
- b) Member of Council of Arbitrators
- c) Fellow of the Institution of Engineers
- d) Eminent Retired Chief Engineer from State/Central PWD/Public sector undertaking of good reputation and integrity
- e) Fellow of Indian Institute of Architects

The contractor shall on receipt of the names as aforesaid, select any one of the person's name to be appointed as a sole Arbitrator and communicate his name to the Employer within thirty days of receipt of the names. The Employer 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 Competent Authority shall make the selection and appoint the selected person as the Sole Arbitrator.

If the Employer fails to send to the contractor the panel of three names as aforesaid within the period specified, the contractor shall send to the Employer a panel of three names of persons who shall all be unconnected with either party. The Employer shall on receipt appoint him as the Sole Arbitrator. If the Employer fails to select the person and appoint him as the Sole Arbitrator within 30days of receipt of the panel and inform the contractor accordingly, the contractor shall be entitled to appoint one of the persons from panel as the Sole Arbitrator and communicate his name to the Employer.

If the Arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever another Sole Arbitrator shall be appointed as aforesaid.

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.

The Arbitrator shall be deemed to have entered on the reference on the date he issued notice to both the parties fixing date of the first hearing.

The Arbitrator may from time to time, with the consent of the parties, enlarge the time for making and publishing the award.

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 place as may be fixed by the Arbitrator in his Sole discretion.

The award of the Arbitrator shall be final and binding on the both the parties.

Subject to aforesaid the provisions to the Arbitration Act. 1992 or any statutory modification or re-enactment thereof and the rules made there under, and for the time being in force, shall apply to the arbitration proceeding under this clause.

The Employer and the contractor hereby also agree that arbitration under clause shall be condition precedent to any right to action under the contract with regard to the matters hereby expressly agreed to be so referred to arbitration

## **SPECIAL CONDITIONS OF CONTRACT**

### **1. DRAWINGS AND SPECIFICATIONS**

The works shall be carried out to the entire satisfaction of the EMPLOYER and the Architect, in accordance with the signed drawings and specifications and such further drawings and details as may be provided by the Architect/Employer, and in accordance with such written instructions, directions and explanations as may from time to time be given by the Employer/Architect, whose decision as to the sufficiency and quality of the work and materials shall be final and binding upon all parties. 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 that it is not comprised in or reasonably to be inferred from the contract he shall before proceeding with such work, give notice in writing to this effect to employer/Architect, and in the event of the employer/Architects agree 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 Employer/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 references shall in no way delay the fulfillment of this contract.

No drawings shall be taken as in itself an order for variation unless, in addition to the employer/Architect's signature, it bears express words stating that it is intended to be such an order or bears a remark '**VALID FOR EXECUTION**'. No claim for payment for extra work shall be allowed unless the said work shall have been executed under the provisions of clause 6 (Authorities notices, patent right and royalties) or by the Authorities of directions in drawing of the Architect as herein mentioned.

One complete set of the signed drawings and specification and schedule of quantities 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 drawing, which in his opinion, may be necessary for the execution of any part of work. Such copies shall be kept at the works, and the architect or his representatives shall, at all reasonable time have access to the same and shall be returned to the Architect by the contractor before the issue of the Final certificate. The contract shall remain in the custody of the Architect, and shall be produced by him at his office as and when required by the Employer or by the contractor.

### **2. INSPECTION OF DRAWINGS**

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

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

The whole of the work is described in the contract a (including the schedule of Quantities, the specifications and all drawing pertaining there to) and as advised by Employer / Architect from time to time is to be carried out and completed in all its parts to the entire satisfaction of the Employer /Architect. Any minor details of the work which may not have been definitely referred to in this contract, but which are usual in practice and essential to the work, are deemed to be included in this contract. Rates quoted in the Schedule shall be inclusive of all freights, Royalties, duties, etc., as well as transportation, so as to execute the contractor as per the rules and regulations of Local Bodies, State Government and Government of India.

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

- a) Labor, maintenance fixing, carrying, cleaning, making good, hauling, watering etc
- b) Plant, machinery, scaffolding, framework, English ladders, ropes, nails, spikes, tools, materials and workmanship protection from weather, shuttering, temporary supports, platform and maintenance of the same.
- c) Covering for the walling and other works during inclement weather or striking or whenever directed as necessary.

The rates quoted by contractor shall include removal of all the existing furniture and other material & dispose them off where ever required including the furniture and material for which the contract has given the pay back offer.

#### **4. SITE SUPERVISION**

The contractor shall appoint at his own cost competent and adequate number of qualified Engineers at site, for (1) joint measurements and preparations of bills, (2) for testing materials at site and outside laboratory, (3) for other general supervision. Their appointment shall be approved by the Employer / Architect. The site Engineers shall not be removed from the site without the written consent of the Employer / Architect.

#### **5. DIMENSIONS**

Figures, dimensions, are in all case to be accepted preferences to scaled sizes. Large-scale details take precedence over small scale drawings. In case of discrepancy, the contractor is to 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.

#### **6. PROGRAMME OF WORKS**

Contractor shall have to prepare and submit the CPM/PERT charges for employer approval immediately after issue of the work order and display the approved charts in the site office. He shall also make bar charts indicating individual items and during the progress of work he shall update the bar charts showing the proportionate progress of work every week.

He shall strictly adhere to the program of works as per CPM/PERT charts showing the proportionate progress of work.

#### **7. 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 material of approved make and quality in sufficient quantities at site to enable him to complete the entire work in the stipulated period. Contractor will get sample of all materials approved by the Employer before placing order / purchase / procurement. They shall conform to I.S. codes and or tender specification as applicable.

For all materials the contractor shall quote for the best quality of the materials of best make / source or supply and it will be got approved by Employer before procurement. In case sufficient quantities of approved quality materials from approved source are not available in time, contractor may have to procure the same from neighboring area with longer leads as required and directed at no extra cost. The material will be, however as per relevant I.S code as and wherever applicable.

#### **8. UNFIXED MATERIALS**

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

## **9. CUSTODY AND SECURITY OF MATERIALS**

The contractors 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.

## **10. RATES**

Rates quoted by the contractor shall hold good for all the work carried out to any height and depth as shown in detailed drawings and as required and directed by the Architect.

Rates quoted by the contractor shall also hold good for any small work at any place at site.

## **11. PRICES FOR EXTRAS ETC., ASCERTAINMENT**

The rates of extra items will be ascertained as below

a) The rates will be derived from the rates of items already quoted in the original tender for the extra work.

b) Where extra work cannot be properly measured or valued, the contractor shall be allowed any work prices at the net rates stated in the tender or the priced schedule of quantities, or if not so stated, then in accordance with the local day work, rates and wages for the district, provided that in either case vouchers 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.

c) The measurements and valuations in respect of the extra items of contract shall be completed within the 'period of final measurement' or within three months of the completion of the contract works as defined under clause (Certificate of Virtual Completion)

## **12. EXTRA ITEMS RATES**

The work or extra items shall be started only after the approval of extra items rates by client / Architect. Rates for additional or extra items work which cannot be derived from the contract item rates shall be calculated on the basis of actual cost plus 15 % for profit.

## **13. DRAWINGS AND INSTRUCTIONS**

A set of major drawings along with the contract documents shall be provided to the contractor. For any clarifications or further drawings are required by the contract, during or before the start of construction work, the Contractor shall inform the employer/Architects 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 of other drawing is required by the contractor he will give a minimum ten days notice to the Employer / Architect.

## **14. FAILURE BY CONTRACTOR COMPLY WITH ARCHITECT EMPLOYER'S INSTRUCTIONS**

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

## **15. INFORMATION TO BE SUPPLIED BY THE CONTRACTOR**

The contractor shall furnish the Employer / Architect the following:

a) Detailed industrial statistics regarding the labor employed by him etc

b) The Power of Attorney, name and signature of his authorized representative who will be in charges for the execution of work

- c) The list of technically qualified persons employed by him for the execution of this work.
- d) The total quantity and quality of materials used for the works.
- e) The list of plant and machinery employed for this work.

#### **16. 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 consequences of such delay, and the contractor, shall not make any claim for compensation or damage in relation thereto.

#### **17. CERTIFICATE AND PAYMENTS**

#### **18. DELAYED PAYMENTS**

#### **19. 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, lockout of control or any other reason, beyond the control of the parties and any breach of clauses arising from much force majeure conditions as aforesaid shall not be regarded as a breach of the provision of this Agreement.

#### **20. INCOME-TAX**

Income Tax shall be deducted at source by the client from the contractor' interim and final bill payments as per Statutory Regulations.

#### **21. SITE MEETINGS**

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

#### **22. SCHEDULE OF APPROXIMATE QUANTITIES AND RATE**

1. The quantities given herein are approximate and they are subjected to alterations omissions, deductions or additions as provided for in the conditions of this contract and do not necessarily show the actual quantities of the work to be done.
2. It is to be expressly understood that the measured work is to be taken net (notwithstanding) any custom or practice to the contrary according to the actual quantities when in place and finished according to the drawings or as may be directed from time to time by the employer and the cost calculated by measurements or weight, at the respective prices, without any additional charge for any necessary or contingent works connected there with. The rates quoted are for work in site and complete in every respects.
3. If any operation of work, which is specified in the respective items mentioned in the schedule of quantities, is not executed by the contractor then proportionately the rate quoted in the schedule shall be re-fixed.

#### **23. ACTION WHERE THERE IS NO SPECIFICATION**

In case of any class of work for which is there is no specification mentioned, the same will be carried out in accordance with the Indian Standards Specifications subject to the approval of the Employer / Architect

#### **24. ACCIDENT AT SITE**

The contractor shall be responsible for the safety of persons employed by him on the works. This shall be without prejudice to the responsibility of the contractor under the

Insurance Clause of the general conditions. Contractor shall take all precaution detailed in the safety code attached separately.

## **25. TYPOGRAPHICAL CLERICAL ERRORS**

The Employer / Architect clarification regarding partially omitted particulars of typographical or Clericals errors shall be final and binding on the contractors.

## **26. 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, goods, signs, temporary passages or other protection necessary for the purpose. All works shall be done by the contractor's risk and if any loss or damage shall result from fire or from others cause, the contractor shall promptly repay 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 held for use in connection with the work. The work shall be carried on to completion without interferences with the operations of existing machinery or equipment, if any.

## **27. 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 those mentioned elsewhere.

## **28. CONTRACTOR'S LABOUR REGULATIONS**

Short title:

1. These regulations may be called the "contractor labour regulations."

2. **Definitions :-** in these regulations, unless otherwise expressed or indicated, the works and expressions shall have the meaning hereby assigned to them respectively, that is to say :

(i) "Labour" means worker employed by the bank's contractor directly or indirectly through a sub-contractor or other persons or by an agent on his behalf of a payment not exceeding Rs. \_\_\_\_\_/- per month and will not include supervisory staff like overseers etc.

(ii) "fair wages" means wages whether for time or piece work notified at the time of inviting tenders for the work and where such wages prescribed by the government of India in the ministry of labour and employment vide Sl.No. 1917 published in the gazette of India, extraordinary part - ii section (3) sub-section (ii) dated 19-5-1969.

(iii) "contractors" shall include every person whether a sub-contractor or headman or agent employing labour on the work taken on contract.

(iv) "Wages" shall have the same meaning as defined in the payment of wages act and includes time and piece rate wages.

2. a. Normally working hours if an adult employee should not exceed 9 hours a day and in case of a child 4 1/2 hours a day. The working day shall be so arranged that inclusive of interval for rest, if any, it shall not spread over more than 12 hours on any day.

2.b. When an adult worker is made to work for more than 9 hours on any day or for more than 48 hours in any week. he shall be paid overtime for the extra hours put in by him at double the ordinary rate of wages. Children shall not be made to work extra.

2.c. Every worker shall be given a paid weekly holiday normally on Sunday in accordance with the provisions of minimum wages (central) rules, 1960 as amended from time to time irrespective of whether such worker is governed by the minimum wages act 1948 or not.

3 Display of notice regarding wage etc. the contractor shall:



(a) Before the commences his work on contract, display and correctly maintain and continue to display correctly maintain in a clean legible condition in conspicuous places on the work, notice in English and in the local Indian language spoken by the majority of workers, giving the rate of wages which have been certified by the executive engineer, ZONAL labour commissioner fair as wages and the hours of work for which such wages are earned, and

(b) Send a copy of such notices to the certifying officer.

- Payment of wages under central govt. wages act:—

(i) Wages due to every worker shall be paid to him direct.

(ii) All wages shall be paid in current coin or currency or in both.

(iii) Arrears claimed after 3 months after the completion of the work shall not be entertained.

- Fixation of wage periods:—

(i) The contractor shall fix the wage periods in respect of which the wages shall be payable.

The minimum daily rates of wages fixed under notification of the government of India in the ministry of labour and employment no. 1972 dated 10-5-78 are inclusive of wages for weekly day of rest and the question of extra payment for week holiday would not arise.

(ii) No wage period shall exceed one month.

(iii) wages of every employed on the contract shall be paid (a) in case of establishments in which wage period is one week within 3 days from the end of the wage period and (b) in the case of other establishments before the expiry of the 7th day or 10th day from the end of the wages period according to the number of workers employed in such establishment does not exceed 1000 or exceeds 1000.

(iv) When the employment of any worker is terminated by or on behalf of the contractor the wages earned by him shall be paid before the expiry the day exceeding the one on which his employment is terminated.

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

**Note:** The term "working day" means a day on which work on which the labor employed is in progress.

**6. wage book and wage slips etc. :** the contractor shall maintain a wage book of each worker in such form as may be convenient at the place of work, but the same shall include the following particulars :-

(a) Name of the worker.

(b) Rate of daily or monthly wages.

(c) Nature of work on which employed.

(d) Total number of days worked during each wage period.

(e) Dates and periods for which worked overtime.

(f) Gross wages payable for the work during each wage period.

(g) All deductions made from the wage with an indication in each case of the ground for which the deduction is made.

(h) Wages actually paid for each wage period.

(i) Signature or thumb impression of the worker.

(j) The contractor shall also issue a wage slip containing the aforesaid particulars to each worker employed by him on the work at least a day prior to the day of disbursement of wages.

(k) The contractor shall issue the employment card in the prescribed form iii to each worker on the day of work or entry in to his employment. If the worker has already any such card with him from the previous employer, the contractor shall merely endorse that

employment card with relevant entries. On termination of employment the employment card shall again be endorsed by the contractor and returned to the worker.

**(l) The contractor shall issue an attendance-cum-wages card as perform:**

Attached to each worker on the day of each worker on entry into his employment.

**7. Register of unpaid wages:** – the contractor shall maintain a register of unpaid wages in such form as may be convenient at the place of work but the same shall include the following particulars:

- (a) Full particulars of the labourers where wages have not been paid.
- (b) Reference number of the muster roll and wage register.
- (c) Rate of wages.
- (d) Wage period
- (e) Total amount not paid
- (f) Reasons for not making payment
- (g) How the amount of unpaid wages was utilized.
- (h) Acquaintance with dates.

**8. Register of accidents:** the contractor shall maintain a register of accidents in such form as may be convenient at the work place but the same shall include the following particulars:

- (a) Full particulars of the labourers who met with accident.
- (b) Rate of wages.
- (c) Sex
- (d) Age
- (e) Nature of accident and cause of accident.
- (f) Time and date of accident
- (g) Date and time when admitted in hospital
- (h) Date of discharge from the hospital
- (i) Period of treatment and result of treatment.
- (j) Percentage of loss of earning capacity and disability as assessed by the medical officer.
- (k) Claim required to be paid under worker's compensation act.
- (l) Date of payment of compensation.
- (m) Amount paid with details of persons to whom the same was paid.
- (n) Authority by whom the compensation was assessed.
- (o) Remarks.

**9. Fines and deductions which may be made from wages:**

(i) The wages of a worker shall be paid to him without any deduction of any kind except the following:

- (a) Fines.
  - (b) Deduction for absence from duty i.e. from the place or the places whereby terms of his employment he required to work. The amount of deduction shall be in proportion to the period for which he was absent.
  - (c) Deduction for damage to or loss of goods expressly entrusted to the employed person for custody, or loss of money or any other deduction which he is required to account, where such damage or loss is directly attributable to this neglect or default.
  - (d) Deduction for recovery of advances or for adjustment of over-payment of wages, advance granted shall be entered in a register.
  - (e) Any other deduction which the central government may from time to time allow.
- (ii) No fine should be imposed on any worker save in respect of such acts and omission on his part as have been approved by the chief labour commissioner.
- (iii) No fine shall be imposed on a worker and no deduction for damage or loss shall be made from his wages until the worker has been given an opportunity of showing cause against such fines or deductions.

(iv) The total amount of fine which may be imposed in any one wage period on a worker shall not exceed an amount equal to three paise in a rupee of wages, payable to him in respect of that wage period.

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

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

**10. Register of fines, etc.:**

(i) The contractor shall maintain a register of fines and a register of deduction for damage or loss in form nos. 1 & 2 respectively which should be kept at the place of work.

(ii) The contractor shall maintain both in English and the local Indian language, a list approved by the chief labour commissioner clearly stating the acts and omissions for which penalty or fine may be imposed on a workman and display it in a good condition in a conspicuous place of the work.

**11. Preservation of registers:** – the wage book the wage slips, the register of unpaid wages, the register of accidents, the register of fines, deductions required to be maintained under these regulations shall be preserved for 45 days after the date of last entry made in them and shall be made available for inspection by the engineer-in-charge labour welfare officer or any other officer authorized by the chief labour commissioner in this behalf.

**12. Powers of labour welfare officer to make investigation or enquiry**

The labour welfare officer or any other person authorized by the central government on their behalf shall have power to make enquiries with a view to ascertaining and enforcing due and proper observance of the fair wage clauses and provisions of these regulations. He shall investigate into any complaint regarding the default made by the contractor or sub-contractor in regard to such provision.

**13. Report of labour welfare officer**

The labour welfare officer or other persons authorized as aforesaid shall submit a report of result of his investigation or enquiry to the executive engineer concerned indicating the extent, if any, to which the default has been committed, with a note that necessary deduction from the contractor's bill be made and the wages and other dues be paid to the labourers concerned. In case an appeal is made by the contractor under clause 14 of these regulations actual payment to the labourers will be made by the executive engineer after the zonal labour commissioner has given his decision on such appeal.

□The executive engineer shall arrange payments to the labours concerned within 45 days from the receipt of the report from the labour welfare officer or the zonal labour commissioner as the case may be.

**14. Appeal against the decision of labour welfare officer:**

Any person aggrieved by the decision and recommendations of the labour welfare officer or other person so authorized may appeal against such decision to the zonal labour commissioner concern within 30 days from the date of decision, forwarding simultaneously a copy of his appeal to the executive engineer concerned but subject to such appeal, the decision of the officer shall be final and binding upon the contractor.

**15. Prohibition regarding representation through lawyer:**

(a) A workman shall be entitled to be represented in any investigation or enquiry under this regulation by:

(a) An officer of a registered trade union of which he is a member.

(b) An officer of a federation of trade unions to which the trade union referred to in clause (a) is affiliated.

(c) Where the employee is not a member of any registered trade union, by any officer, of a registered union, connected with, or by any other workman, employed in the industry in which the worker employed.

(ii) An employer shall be entitled to be represented in any investigation or enquiry under this regulation by;

(a) An officer of any association of employers of which he is a member.

(b) An officer of a federation of association of employers to which the Association referred to in clause (a) is affiliated.

(c) Where the employer is not a member of any association of employers' by an officer of association of employers connected with or by any other employer, engaged in the industry in which the employer is engaged.

(iii) No party shall be entitled to be represented by a legal practitioner in any investigation or enquiry under these regulations.

**16. Inspection of books and slips:** The contractor shall allow inspection of the wage books and the wage slips the register of unpaid wages, the register of a accident, and the register of fines and deduction to any of his workers or to his agent at a convenient time and place after due notice is received or to the labour welfare officer or any other person authorized by the central government on his behalf.

**17. Submission of returns:**

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

□ **Amendment:** the central government may from time to time add to or amend the regulation and on any question as to the application, interpretation or effect of these regulations the decision of the chief labour commission or deputy chief labour commission to the government of India, or any other person authorized by the central government in that behalf shall be final.

□ **Safety code**

Scaffolds:

(i) Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. when a ladder is used an extra mazdoor shall be engaged for holding the ladder and if the ladder used for carrying material as will, suitable footholds and hand holds shall be provided on the ladder and the ladder shall be given an inclination not steeper than 1/4 to 1 (1/4) horizontal and 1 vertical)

(ii) Scaffolding or staging more than 4m. above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached bolted, braced and otherwise secured at least 3 feet high above the floor or platform of such scaffoldings or staging and extending along the entire length of the outside and ends there of with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

(iii) Working platform, gangways, and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 12 feet above the ground level on the floor level. They should be closely boarded, should have adequate width and should be suitably fastened, as described in (ii) above.

□ every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be -3'0". Wherever there are open excavations in ground, they shall be fenced off by suitable railing and danger signals installed at night so as to prevent persons slipping into the excavations.

(v) Safe means of access shall be provided to all working platforms and the working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m. In length while the width between sides rail in rung ladder width shall in no case be less

than 290mm. For ladder up to and including 3m. In length. For longer ladders this width should be increased at least 20mm. for each additional meter or length.

(vi) A sketch of the ladders and scaffolds proposed to be used shall be prepared and approval of the engineer obtained prior to construction.

**Other safety measures**

(vii) All personnel of the contractor working within the plant site shall be provided with safety helmets. All welders shall wear welding goggles while doing welding work and all metal workers shall be provided with safety gloves. Persons employed on metal cutting and grinding shall wear safety glasses.

(viii) Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public.

## FORM OF AGREEMENT

ARTICLES of AGREEMENT made this \_\_\_\_\_ day of \_\_\_\_\_ year 2018 between **The Vice President, SBIIMS, Ground Floor, Beside Commercial branch, LHO Building, Bank street, Koti, Hyderabad-500 095** (Hereinafter referred to as the "Employer/Owner/client" which expression shall, unless excluded by or repugnant to the context, includes its successors and assigns) of the ONE PART and \_\_\_\_\_ of \_\_\_\_\_ (Hereinafter referred to as "Contractor" unless excluded by or repugnant to the context, includes its successors and assigns) of the OTHER PART.

WHEREAS the Employer intends to carry out (**Air Conditioning works for MAIN BRANCH, KHAMMAM, TELANGANA**) and shall herein after referred to as "Project".

AND WHEREAS for the purpose of the above said project, the Employer invited sealed tenders from experienced, resourceful and bonafied contractors vide his Notice Inviting Tender (NO. \_\_\_\_\_ dated. \_\_\_\_\_).

WHEREAS the contractor submitted his Tender Documents containing Notice Inviting Tender, General notes, General Conditions of Contract, Special conditions, Schedule of approximate quantities and rates , Form of Agreement, General Specification, Approved manufacturers/ natural source of materials, Declaration, Technical Specifications as in Schedule of Quantities etc. for the above said project, (Hereinafter collectively referred to as the "said conditions"), duly signed on each page as a token of his acceptance of the same, along with requisite Cost of tender and Earnest Money Deposit

AND WHEREAS out of the Tenders received, the Tender of the contractor was found to be most suitable for the project.

AND WHEREAS the Employer has accordingly issued the work order (NO. \_\_\_\_\_ dt. \_\_\_\_\_) to the contractor subject to his furnishing the requisite Security Deposit.

AND WHEREAS the Contractor has accepted the aforesaid Work Order vide his letter of acceptance NO. \_\_\_\_\_ dt. \_\_\_\_\_ and has also deposited with the Employer a sum of Rs. \_\_\_\_\_ which with the Earnest Money of RS. \_\_\_\_\_ forms the requisite Security Deposit @ 2 % of the accepted Tender Value of Rs. \_\_\_\_\_.

NOW, therefore, it is hereby agreed to and between the parties as follows:

1) Contract documents

The following documents shall constitute the Contract Documents.

I. This Article of Agreement.

II. Tender Document submitted by the Contractor including the "said conditions", N.I.T and Schedule of quantity.

III. All correspondence between the Employer and the Contractor from the date of issue of N.I.T and the date of issue of work order.

IV. Work order No. \_\_\_\_\_ dt. \_\_\_\_\_

2) In consideration of the payments to be made to the Contractor as hereinafter provided the Contractor shall upon and subject to the said conditions, execute and complete the contracted project works shown upon the said drawings etc. and such further detailed drawings as may be furnished to the contractor by the said Employer and described in the said Specifications and the said Schedule of Quantities.

Signature of the Contractor

3) Notwithstanding what are stated in the N.I.T conditions of Tendering, Conditions of Contract of herein stated before, the Employer reserves itself the right of altering the drawings and the nature of the work and addition to or omitting any items of work or of having portions of same carried out departmentally or otherwise and such alterations or variations shall be carried out without prejudice to this contract.

4) As mentioned in Article 1 above, the "said conditions" shall be read and be treated as forming part of this agreement and parties hereto will respectively be bound thereby and to abide by and submit themselves to the conditions and stipulations and perform the same on their parts to be respectively observed and preferred.

5) Any dispute arising under this agreement shall be referred to the Arbitration in a manner specified in the General Conditions of the Contract and all legal disputes shall be limited within the territorial jurisdiction of the Hyderabad thereto. The decision of the arbitration shall be final and binding on both the parties.

IN WITNESS WHEREOF THE PARTIES to their present have here under set and subscribed their hands, the day, month and year first above written.

Signed and delivered for and on behalf of

State Bank of India Infra Management Salutations Pvt. Ltd., Shri.  
\_\_\_\_\_ its duly authorized official, In the presence of –

1. (Name and Address)

2. (Name and Address)

Signed and delivered for and on behalf of

The Contractor \_\_\_\_\_ by Shri \_\_\_\_\_ his duly  
authorized official, in the presence of –

1. (Name and Address)

2. (Name and Address)

**VICE PRESIDENT, SBIIMS**

**READ, UNDERSTOOD AND ACCEPTED**

**SIGNATURE OF THE CONTRACTOR WITH SEAL  
DATE**

**TECHNICAL SPECIFICATIONS**  
**TECHNICAL SPECIFICATIONS FOR VRF SYSTEM**

**General specification for VRV System:**

1.1 The system selected is a modular system, with number of indoors connected to centrally located outdoor units, as per detail designing given in the tender. The outdoor units for all the system shall be air cooled type and mounted on terrace of the building. Indoor units in various areas shall be as per enclosed drawings/ Bill of Quantities.

All the VRV/F air conditioners shall be fully factory assembled, wired, internally piped & tested. The outdoor unit shall be pre-charged with first charge of R 410a refrigerant. Additional charge shall be added as per refrigerant piping at site. All the units shall be suitable for operation with 415 V + 10%, 50 Hz + 3%, 3 Phase supply for outdoor units & 220 V + 10%, 50 Hz + 3%, 1 Phase supply for indoor units.

The VRV/F system shall provide stable, trouble free & safe operation, with flexibility of operating desired indoor units. The outdoor units must be capable of delivering exact capacity proportional to the number of indoor units switched on & the heat load in the air conditioned area. The proportional operation shall be achieved by varying speed of the compressor in the outdoor units.

The operation of the VRV/F system shall be through independent wired/ wireless remote controllers as specified. The entire system shall have the optional feature of Centralized control and Monitoring system through a PC with desired specifications and also shall be able to be integrated with intelligent building management system of leading vendors like Honeywell/ Johnson Controls/ Staefa etc, through BAC Net Gateway. The detailing of operation required through BMS system are detailed under specifications of BMS system.

**1.2 Specification of Outdoor units.**

Outdoors units of the VRV/F system shall be compact air cooled type.

All the compressors of the outdoor units must be all inverter type compressor(s) only, and System ISEER shall not be less than - 4.0 at tender design outside conditions and suitable to operate at heat load proportional to indoor temperature requirement.

The compressor shall be of highly efficient scroll with all inverter control capable of changing the speed in accordance to the cooling load requirement.

The outdoor unit shall have the linear capacity control to meet load fluctuation and indoor unit individual control.

**Manufacturers can offer alternate Outdoor/Indoor Capacities in case of not meeting the tender capacities of TR/CFM as per the data sheet.**



Factory coated (High) "Anti Corrosive" treatment for Al/Black/Blue/Golden fins of Condenser Coils is mandatory. The treatment should be suitable for areas of high pollution and salt laden air.

Back up operation, in case of failure of one of the compressors of outdoor unit, for single module outdoor units or failure of one of the modules in case of multiple module outdoor units shall be possible. The VRV/F outdoor unit shall always be supplying at least 30% of back up operation, of the full load capacity.

The outdoor unit shall employ system of equal run time for all the compressors, inverter or on/ off type, within each outdoor unit – Single Module or Multi Module.

The outdoor units shall be suitable to operate within an ambient temperature range of 15 Deg C to 50 Deg C, in cooling mode & -22 Deg C to 15 Deg C in heating mode.

Air cooled condenser shall have Axial Flow, upward throw fan, directly coupled to fan motors with minimum IP 55 protection. The outdoor unit condenser fan shall be able to develop external static pressure up to 6 mm of H<sub>2</sub>O.

The entire operation of outdoor units shall be through independent remotes of indoor units. No separate Start/ Stop function shall be required.

Starter for the Outdoor Unit compressor shall "DOL or Star Delta" type. Inverter compressor of the unit shall start first & at the minimum frequency, to reduce the inrush current during starting.

Refrigerant control in the outdoor unit shall be through Electronic Expansion Valve. Complete refrigerant circuit, oil balancing/ equalizing circuit shall be factory assembled & tested.

Noise level of outdoor units shall not exceed 64dB (A) at a distance of 1.5 m from the unit.

Outdoor units shall be complete with following safety devices:

High pressure switch

Fan driver overload protector

Over current relay

Inverter Overload Protector

Fusible Plug

Unit shall be supplied with

Installation manual

Operation Manual

Connection Pipes

Clamps

### **1.3 Specifications for Indoor Units**

#### **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 be 288 mm.

The unit must have in built drain pump, suitable for vertical lift of 450 mm. The unit casing shall be Galvanized Steel Plate.

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 & it shall be possible to operate the unit through this IBMS system.

The unit shall be supplied with following from the factory

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 Wired Remote Controller

Wired remote controller shall be supplied as specified in the "Bill of Quantities"

The controller must have large crystal display screen, which displays complete operating status. The digital display must allow setting of temperature with 1 Deg C interval.

Remote shall be able to individually program by timer the respective times for operation start and stop within a maximum of 72 hours

Remote must be equipped with thermostat sensor in the remote controller that will make possible more comfortable room temperature control

The remote shall be able to monitor room temperature & preset temperature by microcomputer & can select cool/ heat operation mode automatically.

The remote must constantly monitor malfunctions in the system & must be equipped with a "self diagnosis function" that let know by a message immediately when a malfunction occurs.

It shall be possible to wire the remote up to 500 RMT.

### **Wireless Remote Controller**

Wireless remote controller shall be supplied as specified in the "Bill of Quantities"

The same operation modes & settings as with wired remote controllers must be possible.

Compact light receiving unit to be mounted into wall or ceiling shall be included.

### **Central Remote Controller - If Specified**

Central Remote controller shall be supplied as specified in the "Bill of Quantities"

Following functions shall be possible

Control Max 64 Groups (128 indoor units)

Zone control

Malfunction code display

All the functions available with wired remote controller

It should be possible to wire the remote to 1000m

## **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.

#### **1.1 GENERAL**

- i) 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.
- ii) All electrical works shall be carried out complying with the Indian Electricity Rules, 1956 as amended to date.
- iii) 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.
- iv) All materials and components used shall conform to the relevant IS specifications amended to date.

#### **1.2 SWITCH BOARDS / MOTOR CONTROL CENTRE**

- i) 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.
- ii) 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.
- iii) 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.
- iv) All MCCBs / MPCBs shall be of AC 23 duty as per IS: 4064-1978 as amended up to date.
- v) 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.
- i) 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.
- ii) 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.
- iii) Identification labels shall be provided against each switchgear and starter compartment, using plastic engraved labels.
- iv) 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.

- v) 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.

#### **1.4 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.
- i) Control cables shall be of adequate cross section to restrict the voltage drop.
- ii) 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.
- iii) 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.
- iv) Control wiring shall correspond to the circuitry/sequence of operations and interlocks approved by Engineer-in -Charge.

#### **1.5 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
- vi) 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.

## 1.6 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.
- i) The starter shall be mounted on the main electrical control panel/ unit mounted / self mounted as specified.
- ii) Each starter shall be provided with the following protections:-
  - a. Thermal overload on all the three phases with adjustable settings,
  - b. Under voltage protection, and

- c. Independent single phasing preventor. (current sensing type)
- iii) 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 .

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**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:
  - i) Manual loading / unloading of capacity control
  - ii) Lubrication oil pressure
  - iii) Safety valve operation
- vi) Vacuum test for the compressor for 0.5mmHg..

**2.2 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.
- iii) Pneumatic pressure test at twice the normal condensing pressure for gas side of condenser shall be carried out.

**2.3 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.

## **2.5 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.

## 2.6 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.

### 2.6.1 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.
- v) 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.
- i) Test and record static pressure drop across all filters and major coils.
- ii) 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.

### 2.6.2 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.

**2.6.3 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.

**2.6.4 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,
- b) AHU room installation drawings
- c) Pipeing 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.

**3.0 FILL THE TECHNICAL DETAILS FOR ALL OUTDOOR AND INDOOR UNITS**

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

## **AIR COOLED SPLIT TYPE AIR CONDITIONERS**

### **1.0 GENERAL:**

- Air cooled split type air conditioner shall consist of units.
  - Evaporator unit ( indoor unit )
  - Condensing Unit ( Outdoor Unit)
- The evaporator unit comprises evaporator coil, evaporator fan assembly installed together in a single sheet metal casing and with inter-connecting refrigerant piping, refrigerant controls, safety devices, etc., The unit shall be complete with electronic center & control pad incorporating the thermostat & speed control.
- The condensing unit comprise compressor-motor unit, condenser coil, condenser fan, fan control, casing supporting stand etc.,.
- Both the evaporator unit and the condensing units shall be factory manufactured.
- The Panel for casing shall be machine pressed and folded. The entire casing shall be factory manufactured, it shall be of robust construction and shall present a neat appearance. The tenderers shall also bring out in their tenders clearly the manufacturing techniques, finishes employed to meet the service conditions involved, etc.,.
- The units supplied with control panel incorporating switch fuse units, contactors, over load relays, single phase preventers, push buttons, etc., compressor and condenser fans.

### **2.0 EVAPORATOR UNIT.**

- All the components of the evaporator units shall be housed in a sturdy MS/GSS casing. In the case of MS casing, it should be dully painted/treated to resist corrosion, rust and other deleterious effects.
- Removable panels shall be provided to finish access to the cooling coil, fan motor compartments filter to facilitate servicing and maintaince work.
- The fan section shall consist of fan, fan casing ( scroll) shaft and driven motor.
- The fan shall be centrifugal type and impeller shall incorporate forward curved blades. the fan shaft and impeller shall be both statically and dynamically balanced.
- The fan scroll shall be designed and shaped to optimize recovery static pressure and maximize efficiency at rated delivery and static pressure
- The fan shall be direct driven by a TEFC squirrel cage induction motor. the tenderers shall confirm electrical characteristics of the motor as required in technical data.
- The fan motor drive etc., shall all be design and mounted so as to minimize noise and vibration.
- The cooling coil shall be of copper tubes and aluminum fins, the concentration shall be not less than 3/cm (8\in).

### **3.0 CONDENSING UNIT :**



## AIR CONDITIONING WORKS OF MAIN BRANCH, KAHMMAM

The unit shall be factory manufactured and shall be suitable for outdoor installation. It shall comprise compressor unit, condenser coil, fan motor, drive casing supporting stands etc.,

The compressor unit shall consist of direct driven reciprocating compressor with compressor and motor housed in a common shell, it shall be either hermetic or semi-hermetic type. in case the compressor motor is semi-hermetic type, the end plate shall be bolted to the shell.

The compressor shall be suitable for use with R-22 refrigerant.

The tenderers are required to narrate in detail all protective devices, controls and such other features provided for the compressor motor units offered by them, like high temperature protection and over current protection, high and low pressure cut-outs. low oil pressure protection etc.,

The condensing unit shall be installed on a pedestal on the terrace of the building as shown in the drawing. the fan shall be propeller type direct-driven by an electrical motor. The unit shall be mounted in such a manner as to minimise transmission of vibration to the structure using vibration isolation pads, if necessary to secure satisfactory results.

The casing and structure for the condensing unit shall be of robust construction. The panels shall be of heavy gauge hot dip galvanized steel and they shall be machine-pressed and folded. All joints shall be folded joints. The supporting structure shall use only hot dip galvanized sections, i.e. angels channels etc.,

The tenderers shall bring out in any case clearly, (and in detail) the details of construction of the equipment offered by them, highlighting in particular, the thickness and kind of materials used, manufacturing techniques employed, finish provided for whether protection etc.,

Air cooled condensing unit shall incorporate necessary number of propeller fans of adequate size to obtain the required air flow rate under operating conditions. the fan shall be balanced both statically and dynamically. The fan motor shall be of TEFC squirrel cage construction.

The fan motor sets shall be complete with protecting guards.

The condenser coil shall be made of copper tubes and aluminum fans. the coils shall be sized so as to optimize performance with respect to air flow rate, pressure drop, condensing temperature, power consumption etc., thus the values furnished for the parameters of the coil in section III, schedule of equipment shall be regarded as suggested values rather than specified values.

The coils shall be pressure tested for values not less than those indicated below.

Factory test - kg/sqcm (psi) : 30 (440)

Field test - kg/sqcm (psi) : 25 (440)

The coils shall be so positioned with respect to the floor level that, dust pick-up by entering air is minimized.

As noted in clause the condensing units have to be installed out door on suitable pedestals or any other appropriate supporting arrangements. Masonry work, if any required for supporting

units shall be provided by the owner, but the tenders shall furnish all necessary information including drawings. Further any supports made of MS structural sections if required should be designed, supplied and installed by the air conditioning contractor himself. He shall show the details of such supports in appropriate drawings and shall obtain the approval of the owners/consultants before providing them. The charges for such works shall be included in the prices quoted by the tenderers: in any case, no extra sum will be payable on that account.

### **4.0 REFRIGERANT PIPING**

- The specifications that follow cover the requirements of piping.
- Only copper piping/tubing of refrigeration quality shall be used. Soft copper tubing can be employed for sizes up to and including 22mm (7/8") OD and 9.5mm (3/8") OD shall have a minimum nominal thickness of 0.76mm (0.030") and 0.81mm (0.032") respectively.
- All piping / tubing shall be new fresh, clean and dry.
- Fittings like bends, tees, sockets, etc. shall be of copper or forged brass. Flare type fittings may be used for copper tubing while hard drawn tubes up to and including 15mm size may be bent to from 90 Deg bends with throat radius being not less than 3 times the tube diameter. For bigger sizes, bends should be used as noted already.
- Liquid line strainers shall be made of brass shall incorporate bronze screen and permanent management. Strainers shall be provided with shut valves on either side.
- Thermostatic expansion valve shall be complete with remote bulb and external equalizer and external super head adjustment. Solenoid valves shall have manual opening system to serve as by-pass in case of failure of solenoid valve. Liquid-moisture indicator shall be provided in the liquid line.
- Flare type joints may be used for copper tubing while for a hard drawn pipe only brazed joints shall be used. For Small lines also such as equalizer lines, expansion valves connections, gauge connections, connecting pressure switches etc., Flared fittings and joints shall be used.
- Piping shall be insulated sufficient number of bends and turns to ensure sufficient flexibility and minimize vibration. Supports, Clamps, Saddles, hangers etc., of adequate strength should be provided as required to support the piping adequately and minimize vibration.
- Necessary isolating material like rubber, felt, spring, etc., should also be provided as an additional measure to limit transmission of noise and vibration.
- Refrigerant piping shall be carried out giving due consideration to the need to ensure oil return and avoid liquid slope-over into the compressor. Accordingly, the piping shall include necessary loops, traps, slopes, etc., to achieve these objectives.
- While installing the piping, adequate clearance between pipes should be provided for insulation is called for
- On completing the erection, the system shall be pressure tested with dry nitrogen or carbon de-oxide. The test pressure shall be as per ASHRAE for R-22.

- High Pressure side - kg /sqcm(psi) : 25 (365)
- Low Pressure side - kg /sqcm(psi) : 110 (150)
- The system shall hold the pressure for a minimum period of 24 hours without revealing leaks.
- After the leak test has been completed successfully, the pressure due to Nitrogen or Carbon-de-oxide in the system.
- The System shall then be dehydrated by drawing a vacuum. The vacuum achieved shall be at least as deep as 500 microns and shall be maintained for a period of at least 24 Hours after the vacuum pump has been shut off.

#### **INSULATION FOR REFRIGERANT PIPING:**

- All suction lines ( insulated both indoors & outdoors) and liquid lines laid outdoors shall be applied over a coat of bituminous primer applied on the pipe surface.

#### **CONDENSATE DRAIN PIPING:**

- PVC Pipes ( Medium) shall be used for condensate drain piping.
- Piping shall be supported suitably on walls/floor and all charges involved there to shall be applied in the prices quoted by the tenderers.
- While Installing the piping the contractor shall keep in mind the requirement that it should not foul with the structural or architectural features of the building. Further, all piping must be installed in a neat and workman - like - manner.

#### **MODE OF MEASUREMENTS**

- Unit prices in the schedule of quantities.
- The item description in the schedule of quantities is in the form of a condensed resume. The Unit price shall be held to include everything necessary to complete the work covered by this item in accordance with the specifications and drawings. The sum total of all the individual item prices shall represent the total price of the installation ready to be handed over.
- The Unit price of the various items shall include the following.
- All equipment, machinery, apparatus and materials required as well as the cost of any tests which, the consultant may request in addition to the tests generally required to prove the quality & performance of equipment.
- All the labour required to supply and install the complete installation accordance with the specifications.
- Use of any tools, equipment's, machinery, lifting tackle, scaffolding, ladders, etc., required by the contractor to carry out his work.
- All the necessary measures to prevent the transmission of vibration.

## AIR CONDITIONING WORKS OF MAIN BRANCH, KAHMMAM

- The necessary material to isolate equipment foundations from the building structure, wherever necessary.
- Storage and insurance of all equipment, apparatus and materials.
- The contractor's unit price shall include all equipment, apparatus material and labour indicated in the drawings and/or specifications in conjunction with the item in question on its own ( and within the system as a whole ) complete, even though not specifically shown described or otherwise referred to.

### **DUCT WORK AND OUTLETS**

#### 1. General :

- ❖ The Work under this part shall consist of furnishing labour materials, equipment and appliance as specified necessary and required to install all sheet metal and other allied work, to make the air cooling supply, ventilation and exhaust system ready for operation as per drawings.
- ❖ Except as otherwise specified, all duct work and related items shall be in accordance with these specifications.
- ❖ Duct work shall mean all ducts, casings, dampers, access doors, joints stiffeners and hangers.

#### 2. Duct Materials :

- ❖ The Ducts shall be fabricated from galvanized steel sheets class IV conforming to ISS : 277-1962 (revised) or aluminum sheets conforming to ISS:737-1955 ( Wherever aluminum ducts are specified)
- ❖ All duct work, sheet metal thickness and fabrication, unless otherwise directed, shall strictly meet the requirements, as described in IS:655-1963 with amendment -I ( 1971 edition)

The Thickness of the sheet, shall be as follows :

<u>SHEET THICKNESS</u>			<u>TYPE OF JOINTS</u>	<u>BRACING IF ANY</u>
Size of the Duct	GI	Aluminum		
upto - 750mm	0.63mm	0.8mm	GI Flange	
751-1000mm 25x25x3mm at	0.80mm	1.0mm	25x25x3mm	
			angel iron	the rate if 1
			frame with	
			8mm dia. nuts	
			and bolts.	
1001-1500mm at	0.80mm	1.0mm	40x40x5mm	40x40x3mm
			angel iron	the rate if 1
Signature of the Contractor				Page 60 of 70

# AIR CONDITIONING WORKS OF MAIN BRANCH, KAHMMAM

frame with
8mm dia. nuts
and bolts.

SHEET THICKNESS			TYPE OF JOINTS	BRACING IF ANY
Size of the Duct	GI	Aluminum		
1501-2250mm at	1.00mm	1.5mm	50x50x5mm	40x40x3mm
1.2			angel iron	the rate if
			to be cross	
			braced diagonally	
			with 10mm dia. nuts	
			& bolts at 125mm	
			center	
2251mm at	1.25mm	1.8mm	50x50x6mm	40x40x3mm
&			angel iron	the rate if
1.6				
above			to be cross	
			braced diagonally	
			with 10mm dia. nuts	
			& bolts at 125mm	
			center	

## Rectangular/Round Duct hangers :

Half of Duct	Hanger rod Diameter (inches)			
perimeters (inches)	Maximum Hanger spacing (feet)			
	10	08	05	04
upto 72	0.25	0.25	0.25	0.25
96	0.375	0.25	0.25	0.25
120	0.375	0.375	0.25	
0.25				
168	0.5	0.375	0.375	
0.375				

192	0.5	0.5	0.375	0.375
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- ❖ The Gauges, Joints and Bracings for sheet metal duct work, shall further conform with the provisions as shown on the drawings.
- ❖ Ducts larger than 450mm shall be cross broken, duct sections upto 1200 mm length may be used, with bracing angle omitted.
- ❖ Changes in section duct of work shall be affected by tapering the ducts with as long taper as possible. All branches shall be taken off at not more than 45 deg. angle from the axis of the main duct, unless otherwise approve by the engineer-in-charge.
- ❖ All ducts shall be supported from the structural/RCC slab by means of MS rods of 9mm (3/8") dia, with MS angle at the bottom as per requirements of engineer-in-charge.

#### *INSTALLATION :*

- ❖ During the construction, the contractor temporarily close duct openings with sheet metal covers, to prevent debris entering to the ducts and to maintain the opening, straight and square, as per the direction of engineer-in-charge.
- ❖ Great care should taken to ensure that, the duct work does not extend outside and beyond the height limits as noted in 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 and all joints should be tight and smooth.
- ❖ All air turns of 45 Degrees or more shall include curved metal blades or vanes arranged so as to permit the air to make abrupt turns, without an appreciable turbulences. turning vanes shall be securely fastened to prevent noise or vibration. All ducts shall be fabricated
- ❖ and installed in accordance with modern design practice. the sheet metal gauges and fabrications procedures as given in IS specifications, shall be considered as an integral part of these specifications.
- ❖ The duct work shall be varied in shape and position, to fit actual conditions in the building. all changes shall be in accordance with accepted air-cooling duct design subject to the approval the engineer-in-charge. The contractor shall also verify all measurements in the building and shall notify to the engineer - in - charge of any difficulty in carrying out his work before fabrication.
- ❖ Sponge rubber of approved equal gaskets, shall be installed between duct flanges as well as between all connections of sheet metal ducts to walls, floor columns, heater casings and filter casing. Sheet metal connections shall be made to wall and floors, by means of galvanized
- ❖ steel angles, anchored to the building structure with anchor bolts and with the sheet bolted to the angles. sheet metal connections shall be as shown in the false ceiling/boxing or supports grouted in the wall.
- ❖ Flanges and supports are to be black, mild steel and are to be primer coated on all surfaces, before erection and painted with aluminum thereafter. Accessories such as damper blades and access panels, are to be of materials of appropriate thickness & the finish , similar to the adjacent ducting as specified.

- ❖ Joints, seems, sleeves, splitters, branches, take off and supports are to be as per duct details specified or as decided by the engineer-in-charge.
- ❖ Joints requiring bolting or riveting, may be fixed by hexagonal nuts and bolts, stove bolts and buck bolts, rivets or closed center top rivets or spot welding, self tapping screws must not be used. All fixing must have a permanently non-corrosive finish such as cadmium
- ❖ plating or galvanizing, whichever is appropriate. Spot welds and bronze welds are to be coated on all surfaces with zin.
- ❖ The flexible joints are to be fitted to the suction and delivery of all fans. The material is to be normally double heavy canvas or as directed by the engineer-in-charge. On all circular spigots the flexible materials are to be screwed or clipboard with adjustable screws or toggle fittings. For rectangular ducts flat or bolted to making flange with backing flat.
- ❖ The flexible joints are to be not less than 75mm and not more than 250mm between faces.
- ❖ The duct work should be carried out in a manner and at such a time as not to hinder or delay the work of the other agencies especially the false ceiling contractors.
- ❖ At the junction of such branch duct with main duct and split of main duct, volume dampers shall be of an approved type, lever operated and complete with locking devices, that will permit the damper to be adjusted and locked in any positions.
- ❖ The dampers shall be of splitter, butterfly or louver type. the damper blade shall be not less than 1.25mm (18 gauge) reinforced with 25mm angles, 3mm thick along any unsupported side longer than 250mm angles, shall not interfere with the operation of damper, nor cause any turbulence.
- ❖ Automatic and manual volume apposed blade diffusers, shall be complete with frames and bronze bearings as per drawings. Dampers and frames shall be constructed of 1.5mm steel & Blades shall not be over 225mm wide.

#### *ACCESS PANEL*

A hinged and gasketed access panel shall be provided on the duct work before each control device that may be located inside the duct work.

#### *MISCELLANEOUS :*

- ❖ All ducts above 450mm are to be cross broken, to provide rigidity to the ducts.
- ❖ All duct work joints are to be true right angle or approaching with all sharp edges removed.
- ❖ Sponge rubber gaskets also should be provided behind the flange of all grilles.
- ❖ Each shoot from the duct, leading to a damper, shall be provided with an air deflector to divert the air into the diffuser through the shoot.
- ❖ Inspection doors measuring at least 450x 450mm are to be provided in each system, at an appropriate location, as directed by the engineer-in-charge.

## AIR CONDITIONING WORKS OF MAIN BRANCH, KAHMMAM

- ❖ Diverting vanes must be provided at the bends exceeding 600mm and at branches connected into the main duct, without neck.
- ❖ Proper hangers and supports should be provided to hold the ducts rigidly, to keep them straight & to avoid vibrations. Additional supports are to be provided where required, for rigidity or directed by the engineer - in - charge.
- ❖ The ducts should be supported by approved type supports at a distance not exceeding 2.4 meters.
- ❖ Sheet Metal connection pieces, partitions and plenums required, shall be constructed of 1.25mm (18 Gauge) sheet thoroughly stiffened with 25mm x 25mm angle iron braces and fitted with access doors.

### Grilles/diffusers :

- ❖ The Supply air diffusers shall be fabricated from MS/AL sections . The grille shall have horizontal extruded section fixed louvers.
- ❖ The Diffusers shall have opposed blade dampers of MS/AL which shall be key operated from the grille face, wherever required.
- ❖ The damper blades shall be of 1.25mm ( 18 Gauge) Al/MS Black sheets and shaped to form air tight joints. The frame work for dampers shall be fabricated from 1.25mm (18 Gauge) Al/MS Black sheet. the grille frame shall be fabricated from extruded aluminum angle. Grilles longer than 450mm, Shall have intermediate supports for the horizontal louvers. the grilles shall generally be to the design of Tuttle & baley grilles and registers.

### PAINTING

- ❖ All grilles and diffusers shall be powder coated in color as approved by the architects/consultants, before installation.
- ❖ All ducts immediately behind the grilles/diffusers, are to be given two coats of black paint in Matt finish.

### TESTING :

- ❖ After completion, all duct system shall be tested for air leakage.
- ❖ The Entire air distribution system, shall be balanced to supply the air quantity as required in various areas and the final balance of air quantity through each outlet, shall be submitted to the engineer- in charge. for approval.

### INSULATION

### GENERAL :

Insulation material will be resign bonded fiber glass or expanded polystyrene of TF ( Treated for fire ) quality or rigid pre laminated with aluminum foil polyurethane foam or phenotherm rigid phenalic foam.

The thermal conductivity of thermal glass shall not exceed 0.034 kcal-m/hr Deg C or 0.27 BTU in/hr sq.ft Deg F at 32 Deg C (90 Deg F) mean temperature, and density shall not be less than 24kg/cu.m. for resign bonded fiber glass thermal conductivity shall not exceed 0.022 kcal-m/hr sq.m Deg C or 0.018 BTU-in/hr-sq.ft Deg F at 32 Deg c mean temperature, and density shall not less than 36 kg/cu.m (3 lb/cu.ft). For expanded



polystyrene the thermal conductivity shall not exceed 0.025 kcal-m/hr.sq.m Deg C/m or 0.024 BTU-in/hr.sq.ft.-Deg C(90 Deg F) mean temperature and density shall not less than 24 kg/cu.m ( 1.5 lb/cu.fot ) for pre rigid prelaminated with aluminum foil polyurethane foam, the thermal conductivity shall not exceed 0.02 kcal m/hr sq.m Deg C or 0.16 BTU-/hr sq.ft. deg F at 32 Deg C ( 90 Deg F ) mean temperature and density shall not less than 36 kg/cu.m (2.26 lb/cu.foot). thickness of the insulation shall be as specified for the individual applications. Adhesive used for setting the insulation shall be non flammable, vapour proof adhesive.

#### ACOUSTIC LINING

The acoustic lining for ducts so identified and marked in the drawing and included in the schedule of quantities shall be provided with acoustic lining of thermal insulation.

#### INSTALLATION:

- ❖ The duct surface shall first be cleaned from inside.
- ❖ The insulation boards shall be wrapped in glass cloth of 7 mil thickness with end stitched.
- ❖ Then the Boards shall be fixed inside the duct.
- ❖ The insulation shall then be covered with 0.5mm perforated aluminum sheets.
- ❖ The sheet and the insulation shall be secured to the duct by means of cadmium plated bolts, nuts washers. The ends should be completely sealed off, so that, no insulation material is exposed.

#### DUCT THERMAL INSULATION. EXTERNAL

- ❖ Wherever supply air ducting exposed to atmosphere shall be insulated with 50mm thick thermocole. first external duct shall be cleaned with a wire brush to remove dirt and dust. Apply a thick coat of bituminous primer. when the primer is still tacky, apply the insulation material.
- ❖ Seal the joints using bitumen. Warp the insulation with 24 gauge GI chicken wire mesh around the insulation and two layers of smooth setting cement plaster each of 6mm thickness applied over length of wire mesh. Duct shall be painted with water proof paint of approved make.

#### ROOF INSULATION

- ❖ Exposed roof over the conditioned areas shall be insulated with 50mm thick expanded polystyrene. For under deck insulation in the conditioned areas, the insulation of TF Quality shall be used.
- ❖ Under deck insulation shall be done by fixing the thermocol slabs by wire and mesh method. raw plugs shall be fixed in the grid of 500mm x 500mm, tie wires and fix thermocol slab rigidly using 24G Plate washers through the GI Wires.

#### INSULATION FOR REFRIGERANT PIPING:

## AIR CONDITIONING WORKS OF MAIN BRANCH, KAHMMAM

- ❖ All suction lines ( insulated both indoors & outdoors) and liquid lines laid outdoors shall be applied over a coat of bituminous primer applied on the pipe surface.

### CONDENSATE DRAIN PIPING:

- ❖ PVC Pipes ( Medium) shall be used for condensate drain piping.
- ❖ Piping shall be supported suitably on walls/floor and all charges involved there to shall be applied in the prices quoted by the tenderers.
- ❖ While Installing the piping the contractor shall keep in mind the requirement that it should not foul with the structural or architectural features of the building. Further, all piping must be installed in a neat and workman - like - manner.

### MODE OF MEASUREMENTS

- ❑ Unit prices in the schedule of quantities.
- ❑ The item description in the schedule of quantities is in the form of a condensed resume. The Unit price shall be held to include everything necessary to complete the work covered by this item in accordance with the specifications and drawings. The sum total of all the individual item prices shall represent the total price of the installation ready to be handed over.
- ❑ The Unit price of the various items shall include the following.
- ❑ All equipment, machinery, apparatus and materials required as well as the cost of any tests which, the consultant may request in addition to the tests generally required to prove the quality & performance of equipment.
- ❑ All the labour required to supply and install the complete installation accordance with the specifications.
- ❑ Use of any tools, equipment's, machinery, lifting tackle, scaffolding, ladders, etc., required by the contractor to carry out his work.
- ❑ All the necessary measures to prevent the transmission of vibration.
- ❑ The necessary material to isolate equipment foundations from the building structure, wherever necessary.
- ❑ Storage and insurance of all equipment, apparatus and materials.
- ❑ The contractor's unit price shall include all equipment, apparatus material and labour indicated in the drawings and/or specifications in conjunction with the item in question on its own ( and within the system as a whole ) complete, even though not specifically shown described or otherwise referred to.
- ❑ Measurements of sheet metal ducts, grilles/diffusers etc.,

### Sheet metal Ducts:

- ❑ All measurements shall be taken as per actual outer duct surface area including bends, tees, reducers, collars, vanes and other fittings. gaskets, nuts, bolts, vibration/rotation pads are included in the basic duct items of item of the B.O.Q.

- ❑ The Unit of Measurements shall be the finished sheet metal surface area in square meters. No extra shall be allowed for laps and wastage's.
- ❑ All the guide vanes, deflectors in duct elbows, branches, grille, collars, quadrant dampers, etc., shall be measured for actual sheet metal surface and paid for at the same rate as a duct of the same thickness.
- ❑ The unit duct price shall include all the duct hangers and supports, exposing of concrete reinforcement for supports and making good of the same, as well as any materials and labour required to complete the duct frame.

GRILLE / DIFFUSERS:

- ❑ All grilles/diffusers as per tender requirements, shall be treated as a lump sum item., where extra grilles/diffusers shall be actual outlet size, excluding the outer flange.
- ❑ The square or rectangular grilles/diffusers shall be measured in plain square meters.
- ❑ All round diffusers shall be measured by their diameter in cm.
- ❑ All linear diffusers shall be measured as per actual length in meters.

❑ ACOUSTIC DUCT LINING :

- ❑ In the case of acoustic lining of air ducts, measurements of the bare inside duct surface in square meters, shall be final for billing purpose.

The insulation/acoustic panels shall include cost of batteries, supports, adhesives, vapour proofing, finished tiles/boards/sheets as well as additional labour and materials required for completing the work.

**DECLARATION**

**TO  
THE VICE PRESIDENT  
STATE BANK INFRA MANAGEMENT SOLUTIONS PVT LTD.  
Ground Floor, Beside Commercial branch, LHO BUILDING,  
BANK STREET, KOTI  
HYDERABAD-500095.**

**NAME OF THE WORK: AIR CONDITIONING WORKS FOR MAIN BRANCH,  
KHAMMAM, TELANGANA**

I/We \_\_\_\_\_ have inspected the site of works and have made me / us fully acquainted with the local conditions in and around the sites of works. I/We hereby declare that I/We have gone through the conditions laid down in the Notice Inviting Tender, Conditions of Contract, Technical Specifications, Bill of Quantities, Approved makes and understood the same and on the basis of the same I/We quoted our rates in the Schedule of Quantities attached with the tender documents.

We accept all the terms and conditions of tender documents (i.e. **Page 1/70 to 70/70**). We will abide by the technical specification mentioned in the tender. We here by undertake to use only specified material/ make as per the tender schedule.

I undertake to submit a hard copy & scanned copy of the tender duly signed on all pages of the tender at your office.

For any type of deviation (to any of above or subsequent instructions), it will be my/ our responsibility to obtain the written instruction of the Engineer-in-charge for the same failing which it shall be deemed that I have carried out any such deviations at my own and I shall be duty bound to replace the all deviated material/ works from the site at my/ our cost as well as I shall be liable to penalized by the employer as deemed fit and for all such loses made thereof, I/ we shall not have any right to arbitrate in any manner.

I/We shall also uniformly maintain such progress as may be directed by the Employer / Architect to ensure completion of same within the target date as mentioned in the tender document.

**Witness:**

\_\_\_\_\_

Signature of Tender

Address \_\_\_\_\_

Date: \_\_\_\_\_

Signature of the Contractor

**SCHEDULE OF APPROXIMATE QUANTITIES AND RATES**

- I. The quantities given herein are those upon which the lump sum cost of the work is based. They are subjected to alterations omissions, deductions or additions as provided for in the conditions of this contract and do not necessarily show the actual quantities of the work to be done. The unit rate noted below are those governing payment of extras or deductions for omissions, according to the conditions of the contract as set forth in the preliminary specifications of the Andhra Pradesh detailed standard specifications and other conditions or specifications of this contract.
- II. It is to be expressly understood that the measured work is to be taken net (notwithstanding) any custom or practice to the contrary according to the actual quantities when in place and finished according to the drawings or as may be directed from time to time by the Architects, and the cost calculated by measurements or weight, at the respective prices, without any additional charge for any necessary or contingent works connected there with. The rates quoted are for work in site and complete in every respects.
- III. If any operation of work, which is specified in the respective items mentioned in the schedule of quantities, is not executed by the contractor then proportionately the rate quoted in the schedule shall be refixed.

**SIGNATURE OF THE CONTRACTOR  
WITH DATE**

**LIST OF APPROVED MANUFACTURERS OF MATERIALS TO BE USED IN THE AIR CONDITIONING WORKS SUBJECT TO THE APPROVAL OF SAMPLES BY THE CONSULTANT/ ENGINEER**

	<b>APPROVED MAKES</b>
	<b>MACHINES</b>
1	<b><u>VRF/F Out Door Unit:</u></b> O-General, Daikin, Carrier, Blue Star, Mitsubishi Heavy, Hitachi & LG
2	<b><u>VRF/F In Door Unit- Cassette Type:</u></b> O-General, Daikin, Carrier, Blue Star, Mitsubishi Heavy, Hitachi & LG
3	<b><u>VRF/F In Door Unit Hi wall Type:</u></b> O-General, Daikin, Carrier, Blue Star, Mitsubishi Heavy, Hitachi & LG
4	<b>Air Cooled Package Units/ Ductable/ Cassette Units :</b> Daikin, Blue Star, Carrier, Hitachi, Mitsubishi Heavy, O-General and LG
5	<b>Split AC Units :</b> Daikin ,Blue Star, Hitachi, Carrier, Voltas, Mitsubishi Heavy, O-General
6	Copper Piping : Totoline / Blue star
7	Nitrile Rubber Insulation : Arm flex / k flex
8	Cables : Finolex / RR cables /poly cab/fine cab
9	<b>DUCTING &amp; ACCESSORIES:</b>
	G.I Sheets : Tata/HSL/SAIL/ JINDAL
	Aluminum Grilles, Diffusers, Linear Grilles: Caryaire, Mapro,
	MS Grilles, Diffusers: Tanus, Mapro, RCS
	Refrigerant Valves: Brassomatic Sant
	'Y' Strainers: Sant, Maharaja Casting
	Temp/Pressure Gauges: Taylor, Fiebig, H Guru
	Fire Dampers: Carryaire, Conaire
	Vibration Isolators: Resistoflex, Dunlop, Kanwal
	Glass wool: UP Twiga, Owens Corning, Kimco
	Expanded Polystyrene (TF Quality) : Beard sell, Lloyd Insulation
	Air Filters : Purolator, Thermadyne
	V belts/Pulleys : Fenner , Dunlop
	Electric Motors : Siemens, Kirloskar, NGEF, Crompton, ABB