



**PROPOSED INTERIOR FURNISHING, ELECTRICAL & AIR
CONDITIONING WORKS FOR BANK OF BARODA, PUNGANUR
BRANCH AT PUNGANUR, CHITTOR DIST, AP.**

TENDER DOCUMENT

CONSULTANTS



3-6-134, flat no 302, SVC-ROYAL DM apartments,
STREET NO 18, HIMAYATNAGAR
HYDERABAD – 500 0029.
Tel. / Fax. : 040 -35561296.
E-mail: abhikramarchitects@gmail.com

**TECHNICAL BID
ANNEXURE**

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Note:

- **The contractor (Proprietor / Partner/Director) should hold and submit valid Andhra Pradesh / Telangana Electrical Licensing Board Class –A license.**
- "The tenders received after the due date and time specified or unsealed or incomplete or unsigned or by facsimile or email will be summarily rejected. The bank reserves the right to accept / reject the bids without assigning any reasons whatsoever."
- **The work is to be done in Existing Premises**

Eligibility Criteria:

- The tenders received after the due date and time specified or unsealed or incomplete or unsigned or by facsimile or email will be summarily rejected. The bank reserves the right to accept / reject the bids without assigning any reasons whatsoever."
- The tenderer should have done Similar works in the Public Undertaking banks and Experience of having successfully completed similar jobs i.e last -7- years(as on tender date) should be either of the following:
 1. One similar completed work each costing not less than 80% i.e. 19,59,788.00
 2. Two similar completed works each costing not less than 50% i.e. 12,24,867.50
 3. Three similar completed works each costing not less than 40% i.e. 9,79,894.00Completion certificate to be provided.

- The tendered shall have an average annual turnover of Rs 7.34 lacs in the last three years.

" Similar work(in single completed project) shall means: Execution of interior works like false ceiling, paneling works, partitions works etc., Electrical works like DB's, cabling, point wiring, electrical fixtures, UPS power points, RAW power points, Data points, Telephone points etc, & Air conditioning works (Cassette type AC works).

- Completion certificate should contain above words.
- Tender will have to be submit in two parts PART: '1' and PART:'2'. PART:1 is Technical bid PART:2 is Financial bid, separately super scribed, sealed and both contained in another sealed envelope, super scribed with the name & address. The tenders should be submitted to
**The General Manager
Bank of Baroda,
Zonal office (HYDERABAD),
D No. 3-6-289, 1st Floor,
Kareem Manzil, Old MLA Quarters,
Hyderguda,Hyderabad– 500029.**
- The work is inclusive of all taxes. GST will be paid extra on the cost of completion of the work. Necessary certificates to be produced.
- The DD's shall be dated between the opening & closing dates & the amount should match as mentioned in the tender schedule.
- **Registered office of minimum Three years old should be functional from the office in AP/Telangana.**
- The contractor must have valid GST registration, PAN.
- The contractor must appoint site supervisor (minimum 5 years' experience in interior works) as single point contact between contractor, Architect and bank officers. He should be qualified in Diploma in Civil engineering (DCE) / Diploma in Architecture (D.Arch.). The details of the same should submit along with tender Documents.

- The contractor should have executed at least one similar project of value 20lakhs and above in Telangana/AP.

DETAILS OF THE CONTRACTOR

Name of the firm/company	:	
Postal address with pin code	:	
Email Address	:	
Telephone no. office 1	:	
Telephone No. office 2	:	
Fax no.	:	
Mobile number	:	
Contact person	:	
Year of establishment	:	
Status of the firm	:	Proprietorship/ Partnership/ Pvt.Ltd/ Ltd company
Registration No	:	
Name of Proprietor/ Partners/ Directors	:	
PAN NO	:	
CST NO.	:	
GST NO.	:	
Name of Bankers	:	
Copy of Balance Sheet for last three years	:	Enclosed/Not enclosed
Date and amount of Current Solvency Certificate	:	

Issued by: Bank's name Amount	:	
EMD amount DD NO. And date and bank's name	:	
Tender fee	:	
DD No. And date and bank's name	:	
<u>Qualifying criteria</u> <u>Works done in last five years</u>	:	No. of works Amount in lacs
<u>Annual Financial turnover</u> <u>2020-21</u> <u>2021-22</u> <u>2022-23</u>		
Name and address of contact person for verification of work done in the past with telephone number	:	
List of Technical and other staff working for the organization	:	
Any other relevant details	:	

SIGNATURE OF AUTHORISED PERSON

NAME

DATE

IMPORTANT INSTRUCTIONS TO THE TENDERERS:

1. Please read all pages of the tender carefully.
2. The documents supplied to you comprises of Notice inviting Tender, Conditions of Tender, Form of Tender, Draft Articles of Agreement, General conditions of the contract, Technical Specifications, Bill of Quantities and Drawings etc.
3. Please sign in full on all pages of this document including drawings/layout etc.
4. Please submit the complete set duly filled in with signature, EMD, drawings etc in two separate covers keeping Tender schedule & drawings in one cover and EMD along with your conditions, deviations, etc in another cover, both sealed separately.
5. You must quote the rates both in words and in figures.

NOTICE INVITING TENDERS

Dear Sir,

Name of the work: INTERIOR FURNISHING, ELECTRICAL & AIR CONDITIONING WORKS FOR BANK OF BARODA, PUNGANUR BRANCH AT PUNGANUR, CHITTOR DIST, AP.

1. Sealed tenders are hereby invited on behalf of our client M/s Bank of Baroda, Zonal Office, Hyderabad for the subject work.
2. The tender documents consisting of Bill of quantities with preambles, Form of Tender, Conditions of the tender, Articles of agreement, Technical specifications, Layout & Drawings etc. can be downloaded from BANK OF BARODA web site www.bankofbaroda.com
3. Issue of tender shall commence from **13/03/2024 between 1000 – 1700** hours. The tender shall be submitted not later than **3.00 PM on 03.04.2024**
4. Sealed tenders duly filled in should be addressed to :
**THE GENERAL MANAGER
BANK OF BARODA,
ZONAL OFFICE (HYDERABAD),
D NO. 3-6-289, 1ST FLOOR,
KAREEMMANZIL, OLD MLA QUARTERS,
HYDERGUDA, HYDERABAD– 500029**

Super scribing the name of the work on top of the sealed envelope–“ **INTERIOR FURNISHING, ELECTRICAL & AIR CONDITIONING WORKS FOR BANK OF BARODA, PUNGANUR BRANCH AT PUNGANUR, CHITTOR DIST, AP.**”

5. The tender will be opened in the office of the Deputy General Manager, Bank of Baroda, Zonal Office, HYDERABAD at **4.00 PM** on **03.04.2024** day in the presence of the tenderers who may wish to be present.
6. Every tender document shall be accompanied by Earnest Money Deposit of Rs.
25,000.00 (Rupees Twenty five thousand only) in the form of a Bankers' Demand Draft drawn in favour of respective branches of Bank of Baroda, payable at HYDERABAD. Tender documents not accompanied by such Earnest Money Deposit are liable to be rejected straight away. EMD shall not bear any interest.
7. Time is the essence of contract. The work should be completed in **Thirty days** from the date of issue of work order.
8. The earnest money shall be retained with the bank in case of successful tenderer, as part of the Security Deposit for the fulfillment of the contract.
9. The tenderer must carefully read and examine the whole tender document, layout and schematic drawings, study the technical specifications, drawings, etc before submitting the tender.
10. No consideration shall be given to a tender received after the expiry of time as stipulated above and no extension of time will normally be allowed for submission of tender.
11. The Notice Inviting Tenders, the conditions of tender and duly completed form of tender, Specifications etc, will form part of the contract Agreement to be executed by the successful tenderer with the Bank.

CONDITIONS OF TENDER:

1. The tender form must be filled in English and all entries must be made by hand and written in ink.
2. An authorized person must sign each and every page of the tender document.
3. The tender must be submitted in the prescribed format only. The tenderers must quote the rates in the schedule of quantities, rate and amount. The rates should be written both in words and figures without any erasures and alterations. However if errors are made, the wrong figures or words must be neatly scored out under full signature of the tenderers and the correct figured and words neatly rewritten. Over writing is not permitted.
4. Errors in the schedule of quantities rates and amount shall be dealt with in the following manner:
 - a) In the event of a discrepancy between the rates quoted in words and the rates in figures, lower rate will be taken into consideration.
 - b) In the event of an error occurring in the amount column as a result of wrong multiplication and extension of unit rate and quantities, the unit rate shall be regarded as firm and the amount shall be amended accordingly.
 - c) All errors in totaling in the amount column and in carrying forward, the totals shall be corrected.
5. The quantities indicated in the schedule of quantities are only probable quantities and are liable to alteration by omission, reduction or addition payment shall be made on the basis of actual quantities of work done at the accepted rates.
6. No alterations which are made by the tenderer in the drawings, specifications or in probable quantities accompanying the tender will be recognized and if any such alterations are made the tender is likely to be rejected and invalidated. Remarks and explanations should be given in a separate cover along with EMD and will become binding only if accepted in writing by the bank at the time of acceptance of the tender.
7. The tenderer must obtain for himself on his responsibility and at his own expenses all the information necessary for the purpose of filling this tender and to enter into a contract with the bank, he must examine the drawings, specifications, conditions etc, and must inspect the site of work and must acquaint himself with all local conditions and matters pertaining there to.
8. The tenderer shall also bear all expenses in connection with the preparation and submission of this tender.
9. **EARNEST MONEY DEPOSIT (E.M.D):**
The tenderer shall also deposit an amount of Rs. **25,000/- (Rupees Twenty five thousand only)** in the form of a Bankers' Demand Draft drawn in favor of respective branches of Bank of Baroda, payable at HYDERABAD at the time of submission of the tender as Earnest Money, Bank is not liable to pay any interest on Earnest Money.

PROVISIONS FOR MICRO & SMALL ENTERPRISES (MSES):- As per Government of India's Public Procurement Policy act 2012, certain benefits will be given for MSE Units. The details are as under:

a) The Public Procurement Policy shall apply to MSEs registered with District Industries Centres or Khadi Village Industries Commission or Khadi & Village Industries Board or Coir Board or National Small Industries Corporation or Directorate of Handicrafts & Handloom or any other body specified by Ministry of Micro, Small & Medium Enterprises.

b) MSEs are exempted from paying Tender/RFP fee/cost, EMDs. For getting the benefits in case of MSE firms, shall submit relevant documents such as valid MSE registration Certificates and exemption certificate from relevant authorities.(Note for Relavant trade only

10. **SECURITY DEPOSIT (S.D) :**

Apart from Earnest Money Deposit made as above, Security Deposit shall be deducted from running/progressive bills of the contractor @ 10% of the gross value of the each bill until the total security deposit including EMD equals to 10% of the accepted value of the tender. Security Deposit shall not bear any interest.

11. **COMPLETION PERIOD:**

The time is the essence of contract. The contractor shall complete the entire work within **30(Thirty)** days from the date of issue of the work order. The work shall be commenced immediately at the site.

The work is of urgent nature and the contractor should strictly adhere to the completion time schedule.

12. The tenders submitted shall remain valid for acceptance for a period of 120 days from the date of their opening. Should any tenderer withdraw his tender before the expiry of the said period or makes any modifications to his tender, the tender shall be treated as having as having been rejected or abandoned and his EMD will be forfeited.

13. The Bank does not bind itself to accept the lowest tender and reserves to itself to reject any or all the tenders received without assigning of reasons thereof. Further, the Bank reserves the right to award any portion of the work or portions of the work to different tenderers or to award the entire work to one tenderer.

14. The tenderer whose tender is accepted is bound to execute agreement with the Bank in accordance with the draft agreement which will include the notice inviting tender, tender conditions, other papers herein, special conditions, drawings and specifications etc, but his liability, under the acceptance of his tender whether the formal agreement is drawn or not. The contractor shall bear all expenses in connection with the execution of the said agreement including fees for stamps and registration of documents as required.

15. The compensation or other sums of money payable by the contractor to the Bank under the terms of contract may be deducted from his EMD/SD if the amount so permits and the contractor shall unless such deposit has become otherwise payable, within ten days after such deduction make good in cash the amount so deducted.

16. The contractor shall carry out the work under the directions and supervision of the consultant and subject to the approval of the Bank in all respects.

17. On acceptance of the tender the contractor shall in writing at once inform the bank and the Consultants the names of his accredited representatives who will be responsible to take instructions from the Consultants/Bank.

18. The work or any part of it shall not be transferred assigned or sublet without the consent of the Bank.

19. The contractor shall be required to co-operate and work in accordance with and afford reasonable facilities for such other agencies/specialists as may be employed by the consultants/Banks on other works/sub works in connection with the work.
20. The contractor will be required to insure the work and keep it insured until one month after the date of taking over the works by the Bank or otherwise as per the terms of the contract, against loss or damage by fire and other usual risks other than the risks accepted in the terms of the contract with an approved insurance company.
21. The contractor is required to comply with all acts of Govt. relating to labour rules and regulations made there under from time to time submit at the proper times all particulars and statements required to be furnished to the labour authorities.
22. In carrying out the work, the contractor shall comply with the provisions of the safety code, annexed to these papers.

FORM OF TENDER FOR WORKS

**THE GENERAL MANAGER,
BANK OF BARODA, Zonal Office (HYDERABAD)
D No. 3-6-289, 1st Floor,
Kareem Manzil, Old MLA Quarters,
Hyderguda, Hyderabad– 500029.**

Dear Sir,

Having duly examined the tender documents including the drawings, specifications, designs, schedule of quantities relating to the works specified in the underwritten memorandum and having visited the site of the said work and having acquired all the requisite information relating there to as affecting this tender. I/We hereby offer to execute the works specified in the underwritten memorandum within time specified there in at the rates specified in the schedule of quantities and in accordance, in all respects with the specifications, designs, drawings and instructions in writing referred to in the conditions of the tender, the articles of agreement, special conditions, the schedule of quantities, and conditions of the contract and with such conditions of the contract and with such materials as are specified, by and in all other respects in accordance with such conditions in the schedule of quantities and conditions of contract so far as applicable.

Should this tender be accepted, in whole or in part, I/We hereby agree (i) to abide by and fulfill all the terms and provisions of the said conditions of the contract annexed hereto and the conditions of tender so far as applicable or in default thereof to forfeit and pay to Bank of Baroda, Zonal Office, HYDERABAD. The sums of money mentioned in the said conditions.

A sum of Rs. **25,000(Rupees Twenty five thousand only)** is hereby forwarded as Earnest Money Deposit in form of Demand Draft drawn in favor of Bank of Baroda, HYDERABAD.

I/We agree (i) that should I/We fail to commence the work specified in the above mentioned memorandum the bank shall without prejudice to any other right or remedy be the liberty to forfeit the Earnest Money, otherwise shall be retained by bank towards security deposit mentioned in the above memorandum. (ii) To execute all the works referred to in the tender document upon the terms and conditions contained or referred to therein and to carry out authorized variations as directed by the Consultants/Banks and as per said conditions of the contract.

Our Bankers are:

- 1.
- 2.

The names of the Proprietor / Partners / Directors of our firm are:

- 1.
- 2.
- 3.

Signature of tenderer with seal

Dated theday of2024.

ARTICLES OF AGREEMENT

Articles of agreement made this theday of2024. between
Bank of Barodahaving its Zonal Office at HYDERABAD (Herein after called the Employer)
of one part. AND

M/s.....having its registered office
at..... (Here in after called the contractor) of the
other part Where as the employer is desirous of getting the ...

Done as per schedule – 1 to this agreement and has annexed drawings, bill of quantities and specifications describing the work to be done are to be prepared by M/s. **ABHIKRAM-S**, Architects, Interior Designers, Valuers, Urban Planners, Project Managers, #3-6-134, SVC ROYAL DM Apartment, Street No.18, Himayatnagar, Hyderabad – 500029.(here in after called “THE CONSULTANTS”) and whereas the said drawings as per schedule – 2 inclusive. The bills of quantities markedand the specifications etc. have been signed by or on behalf of the parties hereto; and where as the contractor has agreed to execute upon and subject to the conditions set forth in schedule-3 hereto attached (herein after referred to as the conditions), the work shown upon said drawings and described in the said specifications and included in the said bill of quantities for the sum of Rupees.....

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. It consideration of sum of Rs ...
To be paid at the time & in the manner set forth in the said conditions, the contractor will upon and subject to the said conditions execute & complete the works shown upon the said drawings & described in the said specifications & bill of quantities.
2. The Employer will pay to the contractor the said sum of Rs.....or such other sum as shall become payable hereunder at the times and in the manner specified in the said conditions.
3. The terms The Consultants in the said conditions shall mean **M/s. ABHIKRAM-S** or in the event of their ceasing to be the Consultants for the purposes of this contract. Such other persons as shall be nominated for that purpose by the said conditions. Provided always that no person subsequently appointed to be the consultants for the time being.
4. The said conditions, specifications and priced bill of quantities shall be read and construed as forming part of this agreement, and the parties hereto will respectively abide by and submit themselves to the conditions and stipulations and perform the agreement on their parts respectively in such conditions, specifications and priced bill of quantities contained.
As witness our hand the day and year first above written signed by said **EMPLOYER.**

SIGNATURE OF EMPLOYER

In the presence of witness:

Name	:	Name	:
Occupation	:	Occupation	:
Address	:	Address	:

As witness our hand the day and year first above written signed by the said Contractor(s):

SIGNATURE OF CONTRACTOR

In the presence of witness:

Name	:	Name	:
Occupation	:	Occupation	:
Address	:	Address	:

CONDITIONS OF CONTRACT

1. Interpretation of Clauses:

- i) In construing these conditions, the specifications, schedule of quantities and Tender and agreement, the following words shall have the meanings here in assigned to them except where the subject or context other requires.
- ii) Headings and marginal notes to the conditions of contract shall not be deemed to form part thereof or be taken in to consideration in the interpretation or construction there of or of the contract.
- iii) Where the context so requires (i) works importing persons include firms and corporations and (ii) works importing the singular only also include the plural and vice versa.
 - a) Employer shall mean BANK OF BARODA, ZONAL OFFICE, HYDERABAD.
 - a) (i) **Consultant:** Shall mean M/s ABHIKRAM-S or in the event of their ceasing to be consultant for the purposes of this contract such other person or persons as shall be nominated for that purpose by the Employer subject to such qualifying provisions as may be agreed upon.
 - b) Contractor shall mean -----and include his/their legal representatives, permitted assigns, or successors.
 - c) **Site:** The site shall mean the site where the works are to be executed as shown with in boundary in red border on the site plan including any building and erections thereon allotted by the Employer for the Contractor's use.
 - d) The "Contract" of this contract: Shall mean the tender documents comprising the notice inviting tender, form of tender conditions, the drawings and priced bill of quantities with their preamble, the acceptance thereof, and the articles of agreement, together with the conditions of contract with its appendix and special conditions, if any the specifications referred to in the conditions, designs, drawings and instructions issued from time to time by the Consultants/Bank and all these documents taken together are deemed to form one contract and shall be complementary to one another.
 - e) **Bills of Quantities:** Variously also termed priced bill of quantities, schedule of rates, shall mean the schedule of quantities originally furnished with the notice inviting tender, duly priced in by the tenderer and accepted by the Employer for inclusion as a part of the contract for determining the consideration payable to the contractor for executing the work and as part of the contract agreement it is also referred to as the contract scheduled.
 - f) Notice in writing or written notice shall mean a notice in written, typed or printed characters sent (Unless delivered personally or otherwise proved to have been received) by registered post to the last known private or business address or to the 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.
 - g) **Act of Insolvency:** Shall mean any act of Insolvency as defined by the presidency towns Insolvency Act. Or the provincial Insolvency Act or any is amending such original.
 - h) Net Prices: If in arriving at the contract amount the contractor shall have added to or deducted from the total of the items in 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 a tender as the price of that item a similar percentage or proportion of the sum so added or deducted by the contractor, the total amount of any price cost items and provisional sums of money shall be deducted from the total amount or the tender. The expression "net prices" when used with reference to the contract or accounts shall be held to mean rates or prices so arrived at.
- i) The works (or the work) shall unless there by something either in the subject or context repugnant to such construction, be considered and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or addition. Wherever the word "works" is used it shall cover "installation" also under the same definition.
- j) **Executed Risks** are risks due to riots (otherwise than among contractors Employees) and civil commotion (in so far as both these are uninsurable war (whether declared or not)

invasion, act of foreign enemies, civil war, rebellion, revolution, insurrection, military or usurped power, any acts of Government, damage from air craft, acts of God such as earthquake, lighting and unprecedented floods and other causes over which the contractor has no control and accepted as such by the Employer or causes solely due to use of occupation in manner for which the works/installations in respect of which a certificate of completion has been issued or a cause solely due to faculty design of works.

- k) **Provisional Items** Shall mean items for which only very approximate quantities have been included in the tender documents.
- l) Virtual Completion of works/installations shall mean the Substantial completion of works/installations in accordance with the contract is enabling the employer to the same.

2. **Consultant/Bank Instructions:** The Contractor shall execute the whole and every part of the work in the most substantial and workmanship like manner and both as regards materials and otherwise in every respect in strict accordance with the specifications, conforming exactly, fully and faithfully, to the designs, drawings, drawings and instructions in respect of the work given by the Consultants/Bank and under the directions of and under the supervision of and subject to the approved in all respects by the Consultant/Bank who may in their discretion and from time to time issue further drawings, and/or written instructions, directions and / or written instructions, details and explanations which are hereafter collectively referred to as Consultant/Bank in regard to:

- a. Variation or modification of the design quality or quantity of Works of the addition or omission or substitution of any work.
- b. Any discrepancy in the drawings or between the schedule of quantities and/or Drawings and/or specifications.
- c. The removal from the site of any materials brought thereon by the contractor and the substitution of any other materials therefore.
- d. The dismissal from the works of any persons employed there upon.
- e. The opening up for inspection of any work covered up.
- f. The amending and making good of any defects under clause 19.
- g. The removal and/or re-execution of any works executed by the contractors, on account of defects under clause 18.

The contractor shall forthwith comply with and duly execute any work comprised in such Consultants/Bank instructions provided always that verbal instructions, directions and explanations given to the contractor or his representative upon the works by the

Consultant/Bank shall if involving a variation be confirmed in writing by the contractor within seven days by and if not dissented from writing with in a further seven days by the Consultants/Bank; such shall be deemed to the Consultant/Bank instruction within the scope of the contract.

Manner of Execution of Work: The Consultant/Bank shall be entitled to, direct at what point or points and in what manner the works are to be commenced, and from time carried on.

Variation to be approved by Employer: Notwithstanding anything herein contained, the Consultant/Bank or his representative shall not, without prior concurrence in writing which will result in the Employer having to pay the contractor any additional sum greater than Rs (tendered amount accepted by the Bank) And all such instructions issued to the employer. The contractor shall submit through the Consultant/Bank a statement of analysis of rates, vouchers etc. the rates on scrutiny and final acceptance of the employer under the terms and clauses 16 hereof shall form a supplementary schedule of quantities.

3. **Agreement copies to be supplied:** The contract Document shall remain in the custody of the Consultant/Bank (Employer) and shall be produced by him at his office as and when required by the Employer/ Consultant/Bank or the contractor. The Consultants/Bank shall

furnish the contractor on the signing hereof or his representatives shall at all reasonable times have access to the same. Before the issue of the final certificate to the contractor he shall, if so required, forth with return to the Consultant/Bank all drawings and specifications.

- 4. The Contractor to provide everything necessary:** The contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and amounts shall except as otherwise provided cover all his obligations under the contract, and all matters and things necessary for the proper completion of works.

The contractor shall provide at his own cost all materials (except such, materials if any as may in accordance with the contract be

supplied by the Employer) machinery, plant, tools appliances, implements, ladders cordage, tackle, scaffolding, in fact everything necessary or proper for the proper execution of the work, whether original, altered or substituted according to the true intent and meaning of the or substituted taken together whether the same may or may not be reasonably inferred there from, and if the contractor finds and discrepancy in the drawings, or between the drawings, schedule of quantities and specifications, he shall immediately and in writing refer to the Consultant/Bank who shall decide which is to be followed, subject to:

- i) Anything shown or contained in any one or other of (a) the drawings, (b) specifications and (c) the contract schedule and not shown in the others shall be equally binding as if it were contained in each of them.
- ii) Figured dimensions are to be followed in preference to the scale, and large scale details in preference to small-scale drawings.
- iii) The following orders of preference shall apply:
 - a) The drawings, (b) specifications, covered by bill of quantities, (c) Technical specifications.

- 5a. Contractor to conform to legal regulations:** The contractor shall conform to the provisions any Act of the Legislature relating to the works and to the regulations and Bye-Laws of any authority and if any water, lighting and other companies and/or authorities with whose system the structure is proposed to be constructed, and shall before making any variations from the drawings or specifications that may be necessitated by so conforming give to the Consultant/Bank written notice, specifying the variation proposed to be made and the reason for it, and apply for instructions thereon. In case the contractor shall no within ten days receive such instructions he shall proceed with the work, confirming to the provisions, Regulations or byelaws in question and any variations so necessitated shall be dealt with under clause 12 & 16.

- 5b.** The contractor shall indemnify the Employer from and against all claims, demands, proceedings damages, or to which it may put by reason not confirming to or complying with any of the provisions of requirements of any act or sanction, central or state, rules, regulations, Bye-Laws of local authorities, Panchayat, collector or any other companies relating to or in water, light or other amenities at the site.

- 6. Contractor Responsible for setting out work:** The contractor shall on the basis of dimensioned drawings and information necessary for the purpose furnished by the Consultants/Bank set out the works on side at his own expense responsible for the correctness of the positions, levels, dimension and setting out by the representative of the consultant or of the Employer shall not in any way he shall amend at his own cost and to the satisfaction of the Consultant/Bank, any error in the setting out or consequential to wrong setting out, found at any stage during the progress of the work or during the defects liability period after completion of the work.

- 7.1** The contractor shall maintain at the site comprehensive registers, posted up-to-date, showing the nature of the materials/articles/goods their identification marks, dates and the results of the tests, etc. such registers shall be got countersigned by the representatives of the

Consultant/Employer at site and extracts from the consultant and the Employer. The form of the registers shall be mutually set.

- 7.2 The costs of the sets and of the materials and labour and equipment if any, involved in the testing operation shall be borne by the Contractor in all cases except as otherwise provided for in the contract.
8. **Supervision by Contractor:** The contractor shall give all necessary personal superintendence during execution of works, and thereafter as long as the Consultants / Bank may consider necessary until the expiration of the "Defects Liability Period" satisfied in clause 19 herein. The contractor shall also during the whole time the works are in progress, employ a competent and qualified representative whose name the Consultant/Bank shall approve and who shall be in attendance at the works while the men are at work. Any directions, explanations, instructions, or notices given by the Consultant/Employer to such representatives shall be held to have been given to the contractor. If the contractor fails to appoint and keep on the works a competent and qualified representative as aforesaid the Consultant/Bank shall have powers to suspend the works till such time a competent qualified representative as aforesaid is posted and the contractor shall not be entitled to claim extension of time on the plea of such suspension of the work.
9. **Dismissal of workmen:** the contractor shall on the request of the Consultant/Employer immediately dismiss from the works any person employed thereon by him who may, in the opinion of such person shall not be again employed on the works without the permission of Consultant/Employer.
10. **Access to works:** The Employer, the consultant and his respective representatives shall at all reasonable times have free access to the works and / or to the workshops, factories or other places where materials are laying or from which they are being obtained and his respective representative, all reasonable facilities necessary for inspection and examination and tests of the materials and workmanship. No person unauthorized by the Employer or the consultant except the representatives of public authorities shall be allowed on the works at any time.
11. **Work not to be sublet:** The whole of the works included in the contract shall be executed by the Contractor who shall not directly or indirectly transfer, assign or sublet the contract or any part share thereof or interest therein without the written consent of the Employer, and no undertaking shall relieve the contractor from active superintendence of the works during their progress.
- 12.1 **Variation not to vitiate the contract:** No alteration, omission or variation shall vitiate this contract but incase if the Consultant/Bank thinks proper at any time during the progress of the works to make any alterations in or additions to or omission from or substitutions for the original drawings, specifications, designs and instructions or any alterations in the kind or quality of the materials to be used in the work and shall give notice thereof to the contractor, in writing the contractor shall alter, add to or omit from or substitute for as the case may require, in accordance with such notice and carry out the amended work on the same conditions in all respects on which he agreed to the main work, but the contractor shall not do any work extra to or make any alterations or additions to or omissions from or substitutions in the works or any deviation from any of the provisions of the contract stipulations, specifications or contract drawings without the previous consent in writing of the Consultant/Bank and the value of such extra, alteration, additions or omissions or substitutions shall in all cases be determined by the Consultant/Bank with the prior approval in writing of the Employer in accordance with the provisions of Clause 16 hereof, and shall be added to or deducted from the contract amount accordingly.
- 12.2 The supply and execution of any part of the carrying out of any works incidental to the execution of any item or class of work shown in the schedule of quantities shall not constitute a variation entitling the contractor to extra paying providing that the said item or class of

work cannot be executed satisfactorily according to the true intent and meaning of the drawings and specifications without the said part thereof or the said work incidental thereto whether the same may or may not be particularly shown or described in the drawings, Specifications and schedule of quantities and provided the same may be reasonably inferred thereof.

- 12.2.1** The time for completion of work shall, in the event including authorized variations results in an addition to the contract sum in excess of 10% be extended on payment by the contractor as follows:

In the proportion which the total executed contract value including authorized Variations bear to the original contract value, the certificate of the consultant/Bank Being conclusive as to such proportion:
25% of the additional time calculated way of above or such further time as may be considered to be reasonable by the consultant/Bank.

- 12.3** Similarly, the changing the position of the work from one to another or to a more difficult position than shown in the drawings or described in the specifications or the contract schedule, of the carrying out of work under circumstances not contemplated in the specification or the contractor to extra payment.

- 13.a No compensation for alteration in or restriction of work:** If at any time after the commencement of the work the Employer for any reason whatsoever does not require the whole or part or parts thereof as specified in the tender to be carried out, the Consultant/Bank shall give notice in writing of the fact to the contractor who shall not claim for any compensation whatsoever on account of any profit which he did not derive in consequence of the full amount of the work not having been carried out. Nor shall have any claim for compensation by reason of any alterations having been made in the original specifications, drawing, designs and instructions that shall involve curtailment of the work originally contemplated.

- 13. b Schedule of quantities on standard of measurement:** The schedule of quantities unless otherwise stated shall be deemed to have been prepared in accordance with the Indian Standard Method of Measurement.

- 14. Errors in Bill of Quantities:** No errors in description or in quantity or by way of omission of items from the schedule of quantities shall vitiate this contract but shall be rectified and the value thereof as ascertained under clause 16 herein shall be added to or deducted (as the case may be) from the contract amount provided that there shall be no rectification of errors in the contractor's schedule of rates.

- 15. Measurement of works:** The Consultant/Bank may from time to time intimate to the contractor and the Employer that he required the works to be measured, the contractor shall fore with attend or send a qualified agent to assist the Consultant/Bank or the representative in taking such measurements and calculations and to furnish all particulars or to give all assistance required either of them. Provided that the contractor shall give notice of not less than ten clear days to the Consultant/Bank or his representative in charge of the work before covering up or placing beyond the reach of measurement any work in order that the same may be measured and correct dimensions thereof be taken before the same in covered or placed beyond reach of measurement any work without the consent of the Consultant/Bank and his representative in ten days inspect the work and cause the measurements to be made if , any work be so covered up without the consent of the Consultant/Bank or his representative-in-charge of the work, the same shall be uncovered at the contractor expense, or in default thereof no payment or allowance shall made for such work or materials with which the same was executed. Should the contractor not attend or neglect or omit to send such agent than the measurements taken by the Consultant/Bank or person approved by him shall be taken to be correct measurement of the works. Such measurements shall be taken in accordance with the Indian Standard Method of Measurement, unless otherwise provided for elsewhere in this contract. The contractor or his agent may at the time of measurement taken

such notes and details as he may require. All authorized extra works, omission and all variations made without Consultant/Bank knowledge, if subsequently sanctioned by him in writing (with the prior approval in writing of the Employer) shall be included in such measurement.

16. Price of variation: The rates for additional, altered, substituted work shall be arrived at in accordance with the following rules:

- i) The net rates or prices in the contract schedule shall determine the valuation of (the rates for) the extra work (items) where such extra work is of similar character and is executed under similar conditions as the work priced therein.
- ii) If the rates for the extra, altered or substituted (deviated) work are not provided for (available) in the contract schedule, they shall to the extent possible be derived out of the rates given in that schedule for similar items. For the purpose of such derivation, where necessary and when so directed, the contractor shall furnish detailed analysis for the said similar or near similar items in the contract schedule. For such portions of the analysis for the extra altered or substituted (deviated) work for which prices cannot be abstracted from the corresponding analyzing of rates for the said similar or near substantiated by purpose bills/vouchers shall be adopted. Using factors and constants for quantum of materials labour T & P and sundries from NBO/CPWD, standard PWD data/analysis in the order. When called upon to do so the contractor shall submit the required purchase bills/vouchers.
- iii) In respect of a contract which incorporates more than one schedule the rate applicable in case (i) above if not provided for in the schedule pertaining to the work in which the addition, alteration or substitution (deviation) occurs, shall be taken as the lowest applicable rate in the other schedule similarly, in case (ii) above, if similar or near similar items cannot be found in the schedule pertaining to the work which the addition, alteration or substitution (deviation) occur, similar or near similar items from the other schedules shall be adopted.
- iv) In the case of additional, altered or submitted (deviate) work for which rates cannot reasonably be derived as at (ii) and (iii) above, the rates shall be worked out adopting market prices substantiated by purchase bills/vouchers, using factors constants for quantum's of material, labour, T&P and sundries from NBO/CPWD/Standard materials, labour T& P and sundries from NBO/CPWD/Standard PWD/data analysis in the order thus written, adding maximum of 15% towards profits and overheads. When called upon to do so the contractor shall submit his purchase bills/vouchers, to the Consultant/Bank.
- v) The question as to what particular items, being similar or near similar to the additional, altered or substituted (deviated) work in the contract schedule are to be adopted for deviation of rates for the additions, altered or substituted (deviated) work and whether the said rates cannot be derived from similar or near to similar items in the contract schedule will decided by the Consultant/Bank.
- vi) In case (ii) to (iv) the contractor is required to submit his analysis of rates adopting the principals enunciated and the Consultant/Bank after scrutinizing the analysis and other paper furnished, will allow such rates as he considers reasonable.
- vii) Where extra work is of such a nature that it cannot be properly measured or valued the contractor shall be allowed day work prices at the net rates stated in the tender or the period schedule of quantities or, if not stated, then in accordance with the minimum local day work rates and wages for the district, notified by the concerned authority. Provided that in either case if required by the Consultant/Bank vouchers, muster rolls and other documents required for proper verification of the labour employed and the materials developed on the said work and the costs thereof be delivered to the Consultant/Bank or his representatives at or before the end of the week following that in which the work has been executed.

The Consultant/Bank will decide the question as to whether extra work is of such nature that it cannot be properly measured or valued. The margin to be allowed on actual costs to the contractor towards profits and overheads shall be 15%.

viii) **Deviation Limit:** It is the value of which the total executed contract value including authorized variation in excess of the original contract value. Expressed as a percentage and shall be adjusted on the sum total of all additions, omissions, reductions, alterations or substitutions (deviations) covered by authorized variations under clause 2 and 13 of the conditions of contract. The values of prime cost sums shall not be included in calculating the above percentage.

17. **Unfixed Materials:** Wherein any certificate (of which the contractor has received payment) the Consultant/Bank has included the value of any unfixed materials intended for and/or placed on or adjacent to the works such materials shall become the property of the Employer and shall not be removed except for use upon the works, without the written authority of the Consultant/Bank. The contractor shall be liable for any loss or damage to such materials.

18. **Removal of Improper work, material etc., :** The Consultant/Bank shall, during the progress of the work, have full powers to order in writing from time to time, removal from the works within such reasonable time in the opinion specified in the order, of any materials which in the opinion of the Consultant/Bank are not in accordance with the specifications or the instructions of the Consultant/Bank or do not conform to approved samples, the substitution of the rejected materials by proper other materials, and the removal and proper re-execution of any work executed with unsound, imperfect or skilled workmanship or with materials not in accordance with the contract, notwithstanding that the same may have been passed or certified or, and paid for and the contractor shall forthwith carry out such order at his own cost.

In case of default on the part of the contractor to carry out such order, the Employer shall have the power to be answerable or accountable for any loss or damage that may happen or arise to such materials removed and all expenses consequent on or incidental thereto as certified by the Consultant/Bank shall be borne by the contractor, or may be deducted by the Employer from money due or that may become due to the Contractor.

In lieu of re-execution of any work not in accordance with the contract Consultant/Bank may in their option allow it to remain but will allow for such work reduced rates. The decision of Consultant/Bank to exercise his option in this regard and the quantum of reduction to be made in the rate for the item in question shall be final and binding on the contractor.

19. **Defects Liability Period:** Any defect, shrinkage, settlement or other faults which may appear within the Defects Liability Period stated in the appendix hereto or if none so stated, within 12 months after the virtual completion of the works arising in the option of the Consultant/Bank from material or workmanship not in accordance with the contract, shall on demand which shall be made within the defects liability period, in writing by the Consultant/Bank and within such reasonable time as shall be stated therein specifying the work, materials or articles complained of notwithstanding that the same may have been passed or/and certified, paid for, be amended and made good by the contractor, at his own proper charges and cost and in case of default. The Employer may employ and pay other person or persons to amend and make good such defects, shrinkage, settlements or other faults and all damages, loss and expenses consequent thereon or incidental thereto shall be made good and borne by the contractor and such damages loss and expenses shall upon the Consultant/Bank certificate in writing be recoverable from the contractor by the Employer or may be deducted by the Employer from any money due or that may become due to the contractor or the Employer may in lieu of such amending and making good by the contractor deduct from any money due to or that may become due to the contractor a sum to be determined by the Consultant/Bank equivalent to the cost of amending and making good such work and in the event of the amount retained under clause 28 being insufficient, recover the balance from the contractor, together with any expenses the Employer may have incurred in connection therewith, should any defective work have been done or material supplied by any subcontractor employed on the works who has been nominated or approved by the Consultant/Bank/Employer as provided in clause 11 the contractor shall be liable to make good in the same manner as if such work or material had been done or supplied by the

contractor himself and been subject to the provisions of clause 2 thereof. The contractor shall remain liable under the provisions of this clause notwithstanding the signing by the Consultant/Bank of any certificate including the final certificate, or the passing of any certificate including the final certificate, or the passing of any accounts.

20. Completion Certificate: The works shall not be considered as completed until the Consultant/Bank has certifies in writing that they have been virtually completed and the defects liability period shall commence from such certified date of virtual completion of work. Within ten days of the completion of work, the contractor shall give notice of such completion of the Consultant/Bank shall inspect the work and if there is no defect in the work shall furnish the contractor with certificate of completion otherwise a provisional certificate of completion indication defects (a) it be rectified by the contractor and / or (b) for which payment will be made at reduce rates, shall be issued but no certificate of shall the work considered to be complete until the work as executed, all scaffolding, surplus materials, walls floors or other parts of any building, in upon or about which the work was executed, or of which he may have had possession for the purpose of execution thereof , and not until the shall have been measured by the Consultant/Bank. If the contractor fail to comply with the requirements of this clause as to removal of scaffolding, surplus materials and rubbish as aforesaid and cleaning off dirt on or before the date fixed for the completion of the work, original or extended in terms of clause 24 herein, the employer after issuing due to notice, may at the expenses of the contractor remove such scaffolding, surplus materials and rubbish; etc; and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall have no claim in respect of any such scaffolding or surplus materials as aforesaid except for any sum actually realised by the sale thereof. And the expenses, if any, so incurred may be recovered from any money due or that may become due to the contractor by the Employer.

21. Contractor Liable for Damage Done:

21.1 The contractor shall be responsible for all injury to persons, Animals or things, and for all structural and decorative damage to the property which may arise from the operation or neglect of himself or if any nominated subcontractor's employee whether such injury of damage arise from care less, accident or any other cause whatever in anyway connected with the carrying out of the contract. This clause shall be held to include, inter-alia, any damage to building, whether immediately adjacent or otherwise, and any damage to roads, streets, foot-paths, bridges or ways as all damage caused to the buildings and works forming the subject of this contract by frost or other inclemency of weather. The Contractor shall indemnify the employer and hold him harmless in respect of all and any acts of Government or otherwise and also in respect of any awards of compensation or damages consequent upon such claims.

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

21.3 The Contractor shall indemnify the employer against all claims Which may be made against of employer by any member of the public or other third party in respect of anything which may arise in respect of the works or in consequence thereof and shall at his own expense arrange to effect and maintain, until the virtual completion of the contract, with an approved insurer a policy of insurance in the joint names of employer and contractor against such a risks and deposits such policy or policies with the employer from time to time during the currency of this contract. The contractor shall also similarly indemnify the employer against all claims which may be made upon the employer whether under the work men's compensation act or any other statue in force during the currency of

this contract or at common law in respect of any employee of the contractor or sub-contractor and shall at his own expenses effect and maintain, until the virtual completion of the contract, with on approved insurer a policy of insurance in the joint names of the employer and the contractor against such risks and deposit such policy or policies with the employer from time to time during the currency of the contract.

The contractor shall be responsible for anything, which may be excluded from the insurance policies above referred to, and also for all other damages to any property arising out of and incidental to the negligent for defective carrying out of this contract. He shall also indemnify the employer in respect of any costs, charges and expenses arising out of claim or proceeding and also in respect of award of compensation for damage arising there from.

The Employer with the concurrence of the Consultant/Bank shall be at liberty and is hereby empowered to deduct the amount of any damage, compensation, costs, charges and expenses arising or occurring from or in respect of any such claims or damage from any or all sums due or to become due to the contractor.

22. Responsibility for safety of building: The contract shall be responsible for the safety of the works (including the materials, temporary building and plant) until they are taken over by the employer and they shall stand at their risk, and be in the sole charge of the contractor, who shall be responsible for and must with all possible speed make good all damage from whatever cause.

22.a Insurance of the works: The contractor shall within 7 days from the date of commencement of the work insure the works at his cost and keep them insured until one month after the works are taken over by the Employer or three months after the date of completion whichever in earlier against laws or damage by fire and unusual risks other than fire against which insures generally provide cover in a CONTRACTORS ALL RISK POLICY, with names of the employers and contractor (the name of former being placed first in the policy), for the fall amount of the contract. Such policy shall cover the property of amount of the employer only and Consultant and surveyor's fees for assessing the claim and in connection with his services generally in re-instatement sub-contractor or employee. The contractor shall deposit the policy and receipts for the premium paid with the consultant within a week of the date of commencement of the work unless otherwise instructed by the consultant/Bank. In default of the consultant/Bank on his behalf may be due or that may become due to the contractor.

The contractor shall as soon as claim under the policy is settled, or the work reinstated by the insurers should they elect to do so, proceed with all due diligence with the completions of the works in the same manner as though the fire or other such risk had not occurred and in all respects under the same conditions of contract. The contractor in case of rebuilding or reinstatement after fire or other such usual risk shall be entitled to such extension of time for completion as the Consultant/Bank decides.

23. Liquidated Damages: If the contractor fails to complete the works by the date stated in the Appendix or within any extended time under clause 24 herein below the contractor shall pay or allow the employer the sum named in the appendix as "Liquidated Damages" for period during completion of the work as defined in the contract, and the employer may deduct such damages from any money due or that become due to the contractor.

24. Extension of Time: If the contractor shall desire of time for completion of the work on the grounds of his having been unavoidably hindered by such causes as(a) force major or (b) any exceptional inclement weather or(c) proceedings taken or threatened by or despite with adjoining or neighboring owners or public owners or public authorities arising otherwise than through the contractors or (d) the work or delays of other contractors or the consultant/bank and not referred to in the schedule of quantities and or specifications or (e) strike or lockout affecting any of the building trades or directly the work or (f) delays in the supply if materials stipulated to be supplied by the employer or any other valid ground, he shall apply in writing to the consultant/bank with in 2 (two) days of the date of such hindrance an account of which he desires such extension as aforesaid and the

consultant/bank, if in his opinion reasonable grounds have been shown thereof, may with the previous approval in writing of the employer make a fair and reasonable extension of time for completion of contract works, but the contractor shall nevertheless the constantly use his endeavours to prevent delay and shall do all that may reasonable be required of him to proceed with the work expeditiously provided.

- a. That the contractor shall have no claim other than extension of time for the delay in completion of the work due to such hindrance and
- b. That the contractor shall suspend the works whenever called upon to do so in writing by the consultant/bank and shall be allowed suspension of work and nothing else.

25. Failure of contractor to comply with consultant/bank Instruction: If the contractor, after receipt of written notice from the consultant/bank requiring compliance within a week fails to Comply with such further drawings/and/or consultant/bank instructions, the employer may employ and pay other persons to execute any such work whatsoever that may necessary to give effect thereto, and all costs incurred in connection therewith shall be recoverable from the contractor by the employer on the certificate of the consultant/bank as a debt or may be deducted by him from any money due or to become due to the contractor.

26. Termination of contract by Employer: If the contractor being an individual or a firm commits any "Act of Insolvency", or company shall have an order for compulsory insolvency or be subject to the supervision of the court and of official assignee or the liquidator in such acts of insolvency or winding up, as the case may be and shall be unable within 7 days after notice to him requiring him to do so, to show to the reasonable satisfaction of the consultant/bank that he is able to carry out and fulfill the contract and to give security therefore, if so required by the consultant/bank. OR if the contractor (whether an individual, firm of incorporated company) shall suffer execution to be issued. OR shall suffer any payment under this contract to be attached by or on behalf of any of the creditors of the contractor. O R shall assign or subject this contract without the consent in writing of the employer first obtained. OR shall charge or encumber this contract or any payments due or which may become due to the contractors there under; OR if the consultant/bank shall certify in writing to the employer that the contractor.

Has abandoned the contract, or has failed to proceed with the works with such due diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon or

Has failed to commence the works, or

Has without any lawful excuse under these conditions suspended the progress of the works for 14 days after receiving the consultant/bank notice to proceed, or

Has failed to remove the materials from the site or to pull down and replace work for seven days after receiving from the consultant/bank written notice that the said Materials or work were condemned and rejected by the consultant/bank under there conditions, or

Has neglected or failed persistently to observe and perform all or any of the acts, matters or things by this contract to be observed and performed by the contractor for seven days after written notice shall have been given to the contractor requiring The contractor to observe or perform the same, or

Has to determine of good workmanship of without the consent if writing of the Employer sublet any part of the contract.

Then and in any of the said causes the employer may not withstanding any previous waiver, after giving seven day's notice in writing to the contractor, determine the contract, but

without thereby affecting the powers of the consultant / bank or 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 determined and as if the works subsequently executed had been executed by or behalf of the contractor. And further the employer by his agents or servants may enter upon and take possessions of the works and all plant, tools, scaffolding, sheds, machinery, steam or other power utensils and materials laying upon the premises or the adjoining lands or roads, and use the same as his own property or may deploy the same by means of his own servants and workmen in carrying on and completing the works or by employing other contractor or persons to complete the work and the contractor shall not in any way interrupt do no act, matter, or thing to prevent or hinder such other contractor/s or other person or persons employed for completing and finishing or using the materials as soon thereafter as convenient the consultant/bank shall give receipt thereof by him the employer shall be entitled to sell the same by public auction and give credit to the contractor for the amount realized.

The contractor's account shall also be credited with the amount that would have been payable to him, for uncompleted work (completed by the Employer through other contractor/s or person as aforesaid) in terms of his agreement as if the contractor had not been determined and he (the contractor) had continued to execute the work to its completion. The actual gross expenses to the employer including incidental charges in completing the uncompleted work through other contractor/s or person or persons shall be debited to the contractor's account if it be not less than the credit for the uncompleted work as above referred if however, the said debit to be made less than the said credit then the amount to be debited shall be less than the said credit, than the amount to be debited shall be equal to the value of the credit given as above referred.

The consultant/bank shall thereafter ascertain and certify in writing what (if anything) in the final accounting is due to payable to the contractor for the sale of the surplus materials and plant and loss the employer shall have been put any owing, to the contractor and vice versa, and the certificate of the consultant/bank in this regard shall be final and conclusive between the parties.

- 27. Certificate and payment:** All bills in triplicate shall be submitted by the contractor along with detailed measurements of the work completed at site provided that at least 50% of the work of the accepted value of the tender has been completed at site by the contractor. The consultant shall check/take the measurements or cause the measurements to be checked/taken for the purpose of having some to be verified and to the extent work has been executed in accordance with the contract, issue interim certificate and the employer shall make payment to the contractor on the basis of such certificates within the period specified for honoring interim certificates (in the appendix to the conditions of the contract) subject to retention of SD at the percentage marked in the said appendix till the whole SD is collected. During the tenure of this contract, only two bills shall be accepted. The first bill shall be as per interim certificate as above and the second bill shall be the final bill as detailed under.

And when the works have been virtually completed and the consultant/bank shall have certified in writing that they have been so completed, the contractor shall submit the final bill in respect of the contract work within one month thereafter and in accordance with the certificate to be issued by the consultant/bank payment shall be made by the employer within the time named in the appendix as "Installment after virtual completion". And the contractor shall be entitled to the payment of the final balance in accordance with the final certificate to be issued in writing by the consultant/bank after the expiration of the period to as "the defects liability period" in the appendix hereto from the date of virtual completion or as soon after the expiry of such period as the works shall have been finally completed and all made good according to the true intent and meaning thereof whichever shall last happen. Provided always that the issue by the consultant/bank of any certificate during the progress relieves the contractor from his liability in case of fraud, dishonesty, or fraudulent concealment relating to the works or material or to any matter dealt with in the certificate and in case of all defects and insufficiencies in the work or materials which is reasonable

examination would not have disclosed. No certificate of the consultant/bank shall it self be conclusive evidence that any work or materials to which it relates are in accordance with the contract neither will be contractors have a claim for any amounts which the consultant/bank might subsequently be discovered as not payable and in this respect the employer's decision shall be final and binding.

The consultant/bank shall have power to with hold any certificate if the works or any parts thereof are not being carried out to his satisfaction.

The consultant/bank, may, in any certificate make any correction in any previous certificate, which shall have been issued by him. No certificate of payment will be issued by the consultant/bank if the contractor fails to insure the works and deep them insured till the issue of the virtual completion certificate of payment may be refused if the contractor fails to execute the formal agreement within two weeks of his being called upon to do so.

28. Security Deposit, Retention money bear no interest: Return money/security deposit, or the balance of it available with the employer, shall be refunded to the contractor in the manner specified in the appendix to the conditions of contract and shall bear no interest whatsoever until the date of its return, not withstanding any provision to the contrary elsewhere in this contract.

29. Matters accepted from Arbitration: The decision, opinion, direction certificates (except for payment) with respect to all or any of the matters under clauses 2,4,7,9,12,16,18,19,24,26 hereof (which matters are herein referred to as the excepted matters) shall be final and conclusive and binding on the parties hereto and shall be without appeal. And other decision, opinion, direction, certificate or valuation of the consultant/bank or any refusal of at the consultant/bank to give any of the same shall be subject to the right of Arbitration and review in the same way in all respect (including the provisions as to opening the reference) as if it were a decision of the Consultant/Bank under the following clause.

30. Arbitration Clause:

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 on this contract or the rights touching or concerning the works or the execution or maintenance operation or effect thereof or to the rights or liabilities of the parties or arising out of or in relation thereto whether during (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 or after determination, for closure or breach of the contract to the contract either of them and to the appointing authority who shall be appointed for this purpose by the employer (Bank of Baroda) be referred for adjudication to a sole arbitrator to be appointed as herein after provided.

For the purpose pf appointing the sole arbitrator referred to above, the appointment authority will send within thirty days of receipt by him of the written notice aforesaid to the contractor a panel of three names of persons who shall be presently unconnected with the organization for which the work is executed.

The contractor shall on receipt by him of the names as aforesaid; select any one of the persons named to be appointed as a sole arbitrator and communicated his name to the appointing authority within thirty days of receipt of him of the names. The appointing authority shall there upon without any delay appoint the said person and the sole arbitrator. If the contractor fails to communicate such selection as provided above within the period specified, the appointing authority shall make the selection and appoint the selected person as the sole arbitrator.

If the appointing authority fails to send to the contractor the panel of three names as aforesaid within the period specified, the contractor shall send to the appointing authority a panel of

three names of persons who shall be unconnected with either party. The appointing authority shall on receipt by him of the names as aforesaid select any one of the persons named and appoint him as the sole person and appoint him as the sole arbitrator within 30 days of receipt by him of the panel and inform the contractor accordingly, the contractor shall be entitled to appoint one of the persons from the panel as the sole arbitrator and communicate his name to the appointing authority.

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 proceeding.

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

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

The fees, if any of the arbitrators shall, if required to be paid before the award is made and published, be paid half by each of parties. The costs of the reference and of the award including the fees, if any of the arbitrator who may direct to and by whom and in what manner, such costs or any part there of shall be paid and may fix or settle the amount of costs to be paid.

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

Subject to aforesaid the provisions of the arbitration Act 1940 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 proceedings under this clause.

31. **Right of technical scrutiny of final bill:** the employer shall have a right to cause a technical examination of the works and the final bill of contractor including all supporting vouchers, abstract etc., to be made at the time of payment of the final bill. If as a result of this examination or otherwise any sum is found to have been over paid or over certified it shall be lawful for the employer to recover the sum.
32. **Employer entitled to recover compensation paid to workmen:** If, for any reason the employer is obliged, by virtue of the provisions of subsection (1) of section 12 of the work men compensation Act 1923, to pay compensation to a work men employed by the contractor, in the execution f the works the employer will recover from the contractor the amount of under sub-section (2) of section 12 of the said Act, the employer will be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by the employer shall not be bound to contest any claim made against him under sub-section (1) if sectuib12, of the said act, except on the written request of the contractor and upon might become liable in consequence if contesting such claim.
33. **Labour Laws/Regulations:** The contractor shall employ labour in sufficient numbers directly through sub-contractors to maintain throughout the period of the contract the rate of progress required according to approved program of work and of quality to ensure proper workmanship in accordance with the specifications and drawings and the Consultant/Bank instructions.

The contractor will comply with the provisions of all Acts of Government relating to labour and the rules and regulations made there under from time to time. He shall also submit at the proper time all particulars statements required to be furnished to the labour authorities on being directed to do so by the Consultant / Bank.

The contract shall register and obtain necessary licenses, maintain all registers, records, notices and documents and submit returns as prescribed by various enactments required under various statutes

Including the contract labour (Regulation and abolition) Act, 1970 and rules made there of all the statutory regulations that are in time in all matters concerning this contract.

The contractor will also comply with all the rules and regulations stated in the minimum wages Act 1948 and the subsequent amendments. The contractor shall indemnify the employer against any liability that may arise due to the noncompliance of any provisions under minimum wages act 1948 or any enactment affecting the work contemplated under the contract.

- 34. Apprentice Act:** The contractor shall comply with the provisions of the Apprentice Act 1961 and the Rules and Orders issued there under from time to time. Failure to do so will amount to a breach of contract and the employer may in his discretion terminate the contract. The contractor shall also be liable for any or other liabilities arising on account of any violation by him of the provisions of the Act.
- 35. When Contractor Dies:** Without prejudice to any or remedies under this contract, if the contractor dies, the employer shall have the option of terminating the contract without compensation to the contractor.
- 36. General Indemnity:** The contractor shall indemnify the employer from and against all claims, demands, proceedings, damages, costs and expenses which may be brought or made against employer or to which it may be put by reason of the contractor not conforming to or complying with any of the provisions or requirements of any Act or Status, Central or State, Rules, Regulations, Bye laws of Local Authorities, Panchayat, Collector or any companies relating to or in connection with the works or to labour or for supply of water ,light or other amenities at the site

WATER AND ELECTRICITY FOR EXECUTION OF WORK:

The Bank shall provide water and electricity as existing to the contractor for minor tools for the purpose of execution of various works and the charges will be deducted from his bills. Any further requirement and in case of power shutdowns or in any other eventuality where in the Bank is not able to provide the above, contractor has to make his own arrangements.

CONTRACTOR TO INSPECT SITE:

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

ACCESS FOR INSPECTION:

The contractor has to provide at all times during the progress of the works and the maintenance period, proper means of access, with ladders, gangways etc. and the necessary

attendance to move and adopt the same as directed for the inspection of measurements of the works by the Bank/Architects or his representatives.

PAYMENT OF MOBILISATION ADVANCE:

No mobilization advance shall be paid.

SAFETY CODE

1. The contractor shall maintain in a readily accessible place **“FIRST AID APPLIANCES”** including adequate sterilized dressing and cotton wool.
2. The injured person shall be taken to public Hospital without loss of time, in case where the injury necessitates hospitalization.
3. Suitable and strong and scaffolds should be provided for workmen for all works that cannot safely be done from ground.
4. No portable single, ladder shall be over 9 meters in length. The width between the side rails shall not be less than 30cm (clear) and the distance between two adjacent rungs not more than 30 cm. When a ladder is used an extra helper shall be engaged for holding the ladder.
5. Providing suitable fencing or railing, the minimum height of which shall be one meter, shall provide every opening in the floor of a building or in a working platform with suitable means to prevent the fall of persons or materials.
6. No floor, roof or any other part of the structure shall be so loaded with Materials as to render it unsafe.
7. Workers shall be provided with protective glasses, footwear and rubber hand gloves wherever required.

Those engaged in welding works shall be provided with welder’s protective eye and gloves.

i) No paint containing lead or lead products shall be used except in the form of paste or ready-made paint.

ii) Suitable facemasks should be supplied for use by the workers when the paint is applied in the form of spray or surface having lead paint if dry rubbed and scraped.

Overalls shall be supplied by the contractor to the painter and adequate facilities shall be provided to enable the working painters to wash themselves during the period of cessation of work.

Hoisting machines and tackle used in the works including their attachments anchorage and supports shall be maintained in perfect conditions.

Ropes used in hoisting or lowering materials or as a means suspension shall be of durable quality and of adequate strength and free from defects.

GENERAL AND TECHNICAL SPECIFICATIONS FOR INTERIOR WORKS

1. These specifications are for the work to be done. Items to be supplied and materials to be used in the works as shown and defined on the drawings and described herein all under the supervision and to the satisfaction of the Consultant/Bank.
2. The workmanship is to be the best available and of a high standard, use must be made of ‘Specialist’ tradesman in all aspects of the work and allowance must be made in the rates for doing so.
3. The materials and items to be provided by the contractor shall be the best of their respective kinds and as approved by the Consultant/Bank in accordance with the samples which may be submitted for approval and generally in accordance with the specifications.
4. Samples of all materials including those specified by name of the manufacture or the brands, trades name or by the reference to catalogue Nos. are to be submitted to the either orders

delivers in the bulk to site. Samples together with their packing are to be provided by the contractor free of any charge and should any materials are rejected, the same will be removed from the site at the expense of the contractor.

5. The contractor is also required to submit specimen finishes of all colours, fabrics, polish shades etc, for approval of the Consultant/Bank before proceeding with such works.
6. Should it be necessary to prepare shop drawings, the contractor at his own expense prepare and submit at least four sets of such drawings to Consultant/Bank for approval
7. The contractor shall produce all invoices, vouchers or receipts account of all purchases done by him for materials if called upon to do so either by consultants or the Bank.

The contractor should verify all measurements given in the drawings at the site before commencing the work. Any difference should be clarified with the Consultant before commencing the work.

Partition line out shall be done at the site before starting the work and got approved from the Consultants.

The contractor shall submit a Bar chart (CPM method) for the project scheduling within one week of letter of acceptance of tender or one day prior to commencement of work whichever is earlier and get the same approved from Consultant/Bank in advance to co-ordinate the work with other agencies.

In order to complete the work in time, the contractor may have to work in more than one shift and beyond office hours. He will do so without any extra charges and without causing any disturbance/inconvenience to the neighborhood.

The contractor shall make necessary security arrangements at the site for the safety of his tools, materials and equipment etc, his own cost.

The contractor shall quote his rate including the cost of materials as specified, corresponding wastages, labour, sales tax or any other taxes & duties, octopi, transportation to work site etc. There shall be no claims on account of idling of labour.

Timber: Hardwood or Teakwood shall be the best wood locally available and should be well & properly seasoned of mature growth free from worm holes, large loose or dead knots or other defects and will not suffer warping, spilling or other defects through improper handling.

Teakwood to be either CP or Ballarshah and shall be best quality, free from soft heart, worm & bee holes and other defects. All wrought timber is to be sawn, planned or works to correct sizes and shapes as shown in the drawings. An allowance of 2mm shall be permitted for each wrought face.

All wooden members shall be liberally coated and treated with anti-termite paint before fixing.

Plywood: Plywood shall be of approved BWP type, make, brand etc, Thickness of plywood shall be as per details given in the drawings/specifications.

Workmanship for joinery: Timbers is to be cut to require size and length and the joinery should start immediately after the line out is finalized. It should be framed up (but not bonded) and stored until required for fixing in position. At this stage it should be bonded and wedged up. Any portion that warps or develops shakes or other defects shall be replaced before wedging up. The whole work is to be framed and finished to a proper line or level and as detailed in the drawings and fitted with all necessary metal ties straps bolts, screws. Twinning bonded joints are to be cross-tongued with teak tongues / dove tailed.

The contractor shall be responsible for providing and maintaining temporary coverage required for the protection of dressed, finished or semi finished works if left unprotected. He is also to clean out all shavings, cut ends and other wastages from all parts of the work at his expenses.

Laminate sheeting shall be of specified thickness, make and either plain, suede, satin or with design finish and samples showing the surface texture and pattern are to be submitted in proper sizes for approval before use.

The laminates shall be fixed with proper adhesive of approved grade and brand.

The contact surfaces of dowels, tenons, wedges etc, shall be glued with proper adhesive. Where ever joinery and carpentry works is likely to come in contact with moisture the adhesive shall be waterproof.

Dealing with Bulging / air entrapped in lamination work;-

No bulging / air bubbles shall be allowed for lamination work. Wherever these bubbles develop due to poor workmanship or any other reason, such portions of work shall be stripped of the old lamination & re-done to the satisfaction of the Architect/ Bank.

Hardware: Shall be of approved make and quality, samples of each and every hardware item should be submitted and got approved before using. This hardware shall generally conform to following:

Butt Hinges: Shall be either brass oxidized aluminum with pins and washers heavy duty type or as specified.

Mortise Locks: Seven levers of Superior brand / equivalent of Godrej only.

Tower bolts: Brass heavy gauge with brass screws only.

Glass & Glazing: The glass used for glazing shall be plain, complying with IS: 3548 unless otherwise specified.

The glass shall be free from any defects such as bubbles, undulations, waves and cracks etc.

Painting & Polishing: All materials required for this work shall be of specified and approved manufacturer, delivered to the site in manufacturer's containers with seals etc. Unbroken and clearly marked with manufacturers name of trademark with a description of the contents and colours. All materials to be stored at the site.

All brushes, tools, pots, kettles etc, used in carrying out the work shall be clean and free from foreign matter.

Surfaces of the new woodwork that are to be painted are to be robbed down. Knotted and stopped to the approval of Consultant/Bank.

Surfaces of previously painted wood work which are to be repainted shall be cleaned with soap solution of approved solvent to remove dirt, grease etc. Whilst wet the surface shall be flatted down with suitable abrasive and then rinsed down and allowed to dry. Minor area of defective paint shall be removed by scrapping back to a firm edge and the exposed surface touched in with primer as described and stopped with putty. Where the wood mark has been previously painted or polished and is to be newly polished, the same shall be prepared with scrapping, burning off or rubbing down. Surfaces of previously painted metal surfaces which are to be repainted shall be cleaned, flatted down and any rust and loose scale shall

be removed completely by chipping, scrapping and wire brushing back to bare metal and touched in with primer as directed by Consultant.

Aluminum sections: Aluminum sections shall be factory extruded out of aluminum ingots with smooth finish without any defects like pore, roughness' etc, and shall be accurate in size, shape and weight etc.

List of INDIAN STANDARDS referred to:

IS: 1200:	Latest Measurements of buildings & Civil Engineering works, Methods of
IS: 287 1973	Recommendation for Maximum permissible Moisture Content of timber.
IS: 1411 1973	Code of practice for seasoning of timber.
IS: 3845 1966	Code of practice for joints used in wooden Furniture
IS: 3548 1966	glazing in buildings.
IS: 1137 1965	Specifications for ready mixed paint
IS: 113 1950	Brushing matt or egg shell flat/wooden
IS: 133 1975	Coating/undercoating/finishing, grey filler etc,
IS: 110 1968	Interiors
IS: 129 1950	

INSPECTION AND TESTING:

The Consultant/Bank shall be entitled at all times at the risk of contractor to inspect and/or test by itself through an independent agency appointed by the Employer to inspect, and/or test all the materials, components, and items of work at the expenses of the contractor. All such tests shall be done as per ISI guidelines and as directed by Consultant/Bank.

TECHNICAL SPECIFICATIONS FOR ELECTRICAL WORKS

CHAPTER 1 INTERNAL ELECTRIFICATION

1.0 Scope :

This specification is intended to cover the requirements of supply, installation, testing and commissioning of electrical wiring installation and other accessories required for its satisfactory operation. This covers the essential requirements or precautions regarding wiring installations for ensuring satisfactory and reliable service.

2.0 Standards :

The Electrical wiring installations and other accessories shall comply with latest IS : 732 - 1989 and National Electrical code - 1985.

3. Construction

Wall mounted switch boards shall be installed such that the bottom is at a minimum height of 1.35 m above finished floor level wherever applicable, as indicated in the drawing.

Equipment which is on the front of a switch board shall be so arranged that inadvertent personnel contact with live parts is unlikely during the manipulation of switches, changing of fuses or similar operation.

In every case in which switches and fuses are fitted on the same pole, these fuses, shall be so arranged that the fuses are not live when their respective switches are in 'OFF' position.

No fuses other than fuses in instrument circuit shall be fixed on the back or behind a switch board panel or frame.

4. Capacity of circuit :

Lighting Circuits shall not have more than a total of ten points of fans, 5A socket outlets and light points and its total load shall not exceed 800 watts. Lights, fans, and 5A socket outlets can be wired on a single common circuit. If fan circuit is drawn separately, circuit shall not be used more than eight points and load shall not exceed more than 800 watts. In the circuit, the neutral and earth wires can be looped up to 10 points. From distribution boards Neutral & Earth wires shall be run for every circuit.

The power circuits shall not have more than two outlets per circuit if load to be fed by each outlet is less than 1KW, and if load is more than 2KW, each outlet shall be connected to a separate circuit.

Switches : All switches shall be placed in the live conductor of the circuit and no single pole switch or fuse shall be inserted in the earth or earthed neutral conductor of the circuits. Single pole switches (other than for multiple control) carrying not more than 15 amperes may be of the piano flush type and the switch shall be 'ON' When the knob is down.

Lamp holders : Lamp holders for use on brackets and the like shall have not less than 1.3 cm nipple and all those for use with flexible pendant shall be provided with cord grips. All lamp holders shall be provided with shade carriers. Where centre contact Edison screw lamp holders are used, the outer or screw contact shall be connected to the 'middle wire' or the neutral or to the earthed conductor of the circuit.

Lamps : All incandescent lamps, unless otherwise specified shall be hung at a height of not less than 2.5 m above the finished floor level.

Ceiling rose : a) A ceiling rose or any other similar attachment shall not be used on circuit, the voltage of which normally exceeds 250 volts.

A ceiling rose shall not embody fuse terminals as an integral part of it.

Every socket outlet shall be controlled by a switch. The switch controlling the socket shall be on the 'live' side of side line. 5 Amps and 15 Amps socket-outlet shall normally be fixed at any convenient place 60 cm above the floor level or near such level as indicated in drawing. 15 Amps socket outlets in kitchen shall be fixed at convenient place 23cm above the working platform. In a room containing a fixed bath or shower, there shall be no socket outlet and there shall be no provision for connecting a portable appliance.

5. Recessed MS conduit wiring system

a) Making of chase : The chase in the wall shall neatly be made and shall be of suitable dimension to permit the conduit to be fixed in the manner desired by the Engineer-in-charge. In the case of buildings under construction, chases shall be provided in the wall, ceiling, etc. at the time of their construction and shall be filled up neatly after erection of conduit and brought to the original finish of the wall.

b) Fixing of conduit in chase : The conduit shall be fixed by means of staples or by means of saddles not more than 600 mm apart. Fixing of standard bends or elbows shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself with a long radius which will permit easy drawing-in of conductors. All the threaded joints of rigid steel conduits shall be treated with approved preservative compound to ensure protection against rust.

c) Inspection boxes : To permit periodical inspection and to facilitate replacement of wires, suitable inspection boxes shall be provided at convenient locations. They shall be mounted in flush with the wall. The minimum size of inspection boxes shall be 75 x 75 mm. Suitable ventilating holes shall be provided in the inspection box covers.

d) Types of accessories to be used : All outlets, such as switches and sockets, may be either of flush mounting type or of surface mounting type.

The switches and other outlets shall be mounted on such boxes. The metal box shall be efficiently earthed with the earth continuity wire run along the conduit.

When crossing through expansion joints in buildings, the conduit sections across the joint may be through flexible copper bellows of the same size as PVC conduit. The Number of wires that can be drawn through a conduit shall be strictly as per IS 732 and as mentioned in Drawings.

6. MS Conduits :

MS conduit shall be black enameled and of thickness not less than 16SWG and of size minimum 19 mm dia. The Conduit shall conform to IS 9537/ Part II

Bunching of cables : Separate conduits shall be used for bunching of conductors of AC supply and DC supply for lighting and small power outlet circuits.

All outlets of conduit systems shall be properly drained and ventilated, but in such a manner so as to prevent the entry of insects etc. as far as possible.

Bends in conduit : Wherever necessary, bends or diversions may be achieved by bending the conduits or by employing normal bends, inspection bends, inspection boxes, elbows or similar fittings.

In case of plain conduit, heat may be used to soften the conduit for bending and forming joints. Positioning of conduit in close proximity to hot surfaces should be avoided.

7. TESTING OF WIRING:

The following tests shall be carried out on all types of wiring on completion of the work and before energizing the installation :

- i) Insulation resistance test,
- ii) Electrical continuity test,
- iii) Earth continuity test,
- iv) Earth electrode resistance test,
- v) Switch polarity test.

i) Insulation Resistance test :

The insulation resistance shall be measured by using 500 v megger between the following points.

Phase and neutral conductor with all fuses in position and all switches in closed condition and main switch in OFF position with lamps and other devices removed.

Between earth and whole system of conductors with all fuses in place, all switches closed and all lamps in position.

Between all conductors connected to one phase of the supply of the above tests shall not be less than 50 divided by the number of points on the circuit. Where a whole installation is being tested, a lower value than that given by the above formula is acceptable subject to a minimum of one megaohm.

The insulation resistance in megaohm as obtained by each of the above tests shall not be less than 50 divided by the number of points on the circuit. Where a whole installation is being tested, a lower value than that given by the above formula is acceptable subject to a minimum of one megaohm.

(ii) Electrical continuity test :

Each and every circuit shall be tested for electrical continuity by using a multimeter.

(iii) Earth continuity test :

The earth continuity conductor including metal conduit shall be tested for electrical continuity and the resistance of the same along with the earthing lead measured from the connection with the earth electrode to any point in the earth continuity conductor in the complete installation shall not exceed one ohm.

iv) Earth electrode resistance test :

The earth electrode resistance shall be tested as specified in section

(v).Switch polarity test :

Test shall be made to verify that all switches in every circuit have been fitted in the same conductor throughout and such conductor shall be marked for connection to the phase conductor.

8 Distribution Boards :

All the distribution boards shall be with MCBs as described in the respective schedule.

The distribution boards shall be controlled by a switch fuse, miniature circuit breaker or an isolator as described in the respective schedule. Each outgoing circuit shall be provided either with MCB or a fuse on the phase. The neutral shall be connected to a common link and be capable of being disconnected individually for testing purposes.

The distribution boards shall be located as indicated in the respective electrical working drawings and as directed by Engineer - in - charge. The distribution boards shall be fixed on wall in the niche provided and marked with the details of circuits, source of supply, size of incoming wires Etc.,

All marking shall be clear and legible.

The total load of the consuming devices shall be evenly distributed between the number of ways of distribution board.

The consuming devices circuit shall be connected to distribution board in proper sequence, so as to avoid unnecessary crossing of wires.

Cables shall be connected to a terminal only by crimped lugs.

Cables shall be rigidly fixed in such a manner that a clearance of at least 2.5cm is maintained between conductors of opposite polarity or phase and between the conductors and any material other than insulating material.

The incoming and outgoing cables shall be neatly bunched.

9. MOUNTING HEIGHTS :

The Mounting heights of various fixtures shall be as specified in the Drawings.

CHAPER 2

POWER CONTROL CENTRES

1.0 Scope :

This specification is to cover the requirement of design, supply, installation, testing and commissioning of LT power control centres / main switch boards with all components, Instruments, fittings and accessories for efficient operation without any trouble.

2.0 Standards:

The PCC specified herein, unless otherwise stated shall conform to the relevant and latest revisions of Indian standards and Indian Electricity Rules.

3.0 Design and construction :

3.1 Design requirements : The power control centres shall be suitable for operation on 440volt, 3 phase,4wire 50HZ system to withstand a short circuit level of 50 KA RMS symmetrical.

The PCC shall be designed for operation in high ambient temperature upto 45 degrees centigrade and high humidity upto 95% and tropical atmospheric conditions. Means shall be provided to facilitate ease of inspection, Maintenance and Servicing.

3.2 Constructional requirements :

The power control centre shall be of

i) Metal clad, cubicle, indoor, free standing type suitable for Mounting on Built up Trenches with U Channels of adequate size.

ii) Made up of the requisite vertical sections, which when coupled together shall form continuous dead front switch board.

iii) Dust and damp protected, the degree of protection shall be better than IP - 54 as specified in IS-2147.

iv) Readily extendable on both sides by the addition of vertical sections after removal of the end covers.

v) Single front construction with the circuit breaker feeder and switch fuse feeders suitable for operation from the front of the panel.

The PCC shall have the feeder ratings as per the schematic diagrams enclosed with the schedule and constructed only of materials capable of withstanding the mechanical, electrical and thermal stresses as well as the effects of humidity, which are likely to be encountered in normal service.

3.3 Vertical Sections :Each vertical section shall comprise a front framed structure rolled folded sheet steel channel section of minimum 2 mm thickness rigidly bolted together. This structure shall house the components contributing the major weight of the equipment such as circuit breaker, switch fuse units, main horizontal busbars, vertical risers and other front mounted accessories. The structure shall be mounted on a rigid base frame of folded sheet steel of minimum of 2.5 mm thickness and 100mm height. The design shall ensure Structural stability during Transit and also during Operation after Commissioning Suitable cable chamber housing the cable end connections and power / control cable terminations shall be provided. The design shall ensure generous availability of space for ease of installation and maintenance of cabling and adequate safety for working in one vertical section without coming into accidental contact with live parts in the adjacent section.

A cover plate at the top of the vertical section shall be provided with necessary ventilating arrangements. Any aperture for ventilation shall be covered with a perforated sheet having less than 1 mm diameter perforations to prevent entry of vermin.

3.4 Sheet Steel Cubicle :

3.4.1 The sheet steel cubicle shall be designed in fully segregated multitier formation. Each cubicle shall have hinged front access door with easy operating fasteners. All the doors and covers shall be heavily gasketed to make the compartment dust tight. Each cubicle shall have a covering at the

bottom to make a dust and vermin proof construction. Door hinges shall be of concealed type.

The cubicle shall be of minimum 2 mm thick sheet steel. Sheet steel shrouds and partitions shall be of minimum 1.6 mm thickness. All sheet steel work forming the exterior of switch boards shall be smoothly finished, leveled and free from flaws. The corners shall be rounded. The minimum Thickness of Gland plates shall be 3mm.

3.4.2 The apparatus and circuits in the power control centers shall be so arranged as to facilitate their operation and maintenance at the same time to ensure the necessary degree of safety. Apparatus forming part of the control centers shall have the following minimum clearance.

- i) between phases - 25 mm,
- ii) between phase and neutral - 25 mm,
- iii) between phases and earth - 25 mm,
- iv) Between neutral and earth - 19 mm,

When, for any reason, the above clearances are not available suitable insulation shall be provided. Clearance shall be maintained during normal service conditions. Creepage distances shall comply with those specified in relevant standards.

3.4.3 All insulating materials used in the construction of the equipment shall be non hygroscopic duly treated to withstand the effect of high humidity, high temperature and tropical ambient service conditions.

3.4.4 Functional units such as circuit breakers and fuse switches shall be arranged in multitier formation, except that not more than One air circuit breaker housed in a single vertical section.

3.4.5 Metallic/insulated barriers shall be provided within vertical sections and between adjacent sections to ensure prevention of accidental contact with :

- i) Main busbars and vertical risers during operation, inspection or maintenance of functional units and front connected accessories.
- ii) Cable terminations of one functional unit, when working on those of adjacent unit/units.

3.4.6. All doors / covers providing access to live power equipment / circuits shall be provided with tool operated fasteners to prevent unauthorized access.

3.4.7 Provisions shall be made for permanently earthing the frames and other metal parts of the switchgear by two independent connections.

3.5 Metal treatment and finish :

All steel works used in the construction of the switch boards shall have undergone a suitable rigorous metal treatment process so as to remove oxide scales and rust formation and to facilitate a durable coating of the paint on the metal surfaces and also to prevent the spreading of rust, in the event of the paint film being mechanically damaged.

Two coats of Anti Corrosive primer followed by a finishing coat of Epoxy spray power coating of the shade 631 of IS : 5 (i.e. Siemens grey) shall be given. The total thickness of paint shall not be less than 25 micron.

3.6 Bus Bars :

3.6.1 The busbars shall be housed in non-segregated sheet steel compartments in the cubicle at convenient locations with provision for access to the buses from the front of the panel. The busbar shall be suitably braced with DMC/SMC supports to provide a through fault withstand

capacity of 50 KA RMS symmetrical for one second and a peak short circuit withstand capacity 150 KA minimum. The neutral as well as the earth bus shall be capable of withstanding the above fault level.

3.6.3 Large clearance and creeping distance shall be provided on the busbar system to minimize the possibility of a fault.

3.6.4 High tension bolts, nuts and spring washers shall be provided at all busbar joints.

3.6.5 The continuous rating of the busbar shall be 125% of the rated current. Maximum temperature of the bus and the connections shall not exceed 85 degrees centigrade. The busbars shall be of liberal design for the required current rating i.e. 0.8Amp/sq.mm.

The main phase busbars shall have continuous current rating throughout the length of each power control centre and the neutral busbars shall have continuous rating of at least 50% of phase busbars.

3.6.6 Connections from the main busbars to functional circuits shall be arranged and supported so as to withstand without any damage or deformation, the thermal and dynamic stresses due to short circuit currents.

All busbars and tapings shall be provided with color coded sleeves for phase identification.

All joints/tapping points of the buses shall be suitably shrouded to prevent accidental contact.

4.0 **Circuit Breakers :**

4.1 General :

4.1.1 Circuit breakers shall be of triple pole / four pole, air break, horizontal draw out /Fixed type, as given in the schedule of work and comply with the requirements of relevant IS with latest amendments and shall have the following :

- i) A short circuit breaking capacity of not less than 50 KA RMS at 415 volts, 50 Hz AC.
- ii) A short circuit making capacity of 105 KA.
- iii) A short time withstand capacity of 150 KA for one second.
- iv) Electrical overload performance at 6 times the rated current, 100% of the rated voltage as recovery voltage at 0.5 power factor.
- v) Dielectric test of 2.5 KV applied for one minute on main circuits.

4.1.2 The circuit breakers shall be fitted with detachable arc chutes on each pole designed to permit rapid dispersion, cooling and extinction of the arc. Interphase barriers shall be provided to prevent flash over between phases.

4.1.3 Arcing contacts shall be of hard wearing material copper tungsten or silver tungsten and shall be easily replaceable. Main contacts shall be of silver plated copper of high pressure type and generous cross section.

4.2 Operating Mechanism :

The operating mechanism shall be of robust design, with minimum number of linkages to ensure maximum reliability. Manually operated circuit breakers shall be provided with spring operated closing mechanism which are independent of speed of manual operation. Electrically shall be independent of the motor which shall be used slowly for charging the closing spring.

The operating mechanism shall be such that the breaker is at all times free to open immediately when the trip coil is energized.

Mechanical operation indicators shall be provided to show open and close positions of the breaker. Electrically operated breakers shall be additionally provided with mechanical indications to show charged and discharged conditions of the charging spring.

Means shall be provided for slow closing and opening of the breaker for maintenance purposes, and for manual changing and closing of electrically operated breakers during emergencies,

4.3 Protection :

Provisions shall be available for fitting a minimum of five trip devices - three over current, as shunt trip and an under voltage release or two over current and earth fault release, a shunt trip and one under voltage release. The breakers shall be of the shunt or series trip type as specified in the schedule.

4.4 Housing of Circuit Breaker :

Circuit breakers shall be individually housed in sheet metal castle provided with hinged doors. The breaker along with its operating mechanism shall be mounted on a robust carriage moving on guide rollers within the castle. Isolating contacts for both power and control circuits shall be of robust design and fully self aligning. The assembly shall be designed to allow smooth and easy movement of the breakers within its castle.

The breaker shall have three distinct positions within the castle as follows :

- i) `Service' position : With main and auxiliary contacts connected.
- ii) `Test' position : with power contacts fully disconnected and control circuit contacts connected.
- iii) `Isolated' position : with both power and control circuit contacts fully disconnected.

It shall be possible to achieve any of the above positions with the castle doors closed. Mechanical position indicators shall be provided for the three positions of the breakers.

4.5 Interlocking :

4.5.1. The moving portion of the circuit breaker shall be interlocked so that :

- i) It shall not be possible either to isolate it from the connected position, or to plug it in from the Isolated position with the breaker closed.
- ii) The circuit breaker can be closed only when it is in one of the three positions or when it is fully out of the castle.
- iii) It shall not be possible to open the hinged door of the castle unless the breaker is drawn to the isolated position.
- iv) Inadvertent withdrawal of the circuit breaker too far beyond the supporters is prevented by the suitable stops.

4.5.2 Provisions shall be available for the padlocking of the circuit breaker access flame in any of the three positions.

4.5.3 Automatically operated safety shutters shall be provided to screen the fixed isolating contacts when the breaker is drawn out from the castle.

4.5.4 The moving portion of the circuit breaker shall be provided with a heavy duty, self aligning

earth contact, which shall make before and break after the main isolating contacts during insertion into with drawl from the service position of the breaker. Even in the isolated position positive earthing contact should exist.

4.5.5 Auxiliary switches directly operated by the breaker operating mechanism and having 4 'NO' and 4 'NC' contacts, shall be provided on each breaker. The auxiliary switch contacts shall have a minimum rated thermal current of 10 amps.

5.0 Switch Fuse Units :

5.1 General :

The switch fuse units shall be of the load break, heavy duty, cubicle type conforming to the requirements IS and of AC 23 duty.

The switch fuse units shall be capable of withstanding the thermal and electromagnetic stresses caused by short circuits for the time of operation of the associated fuse links.

The switch fuse units shall be double break and have quick make break mechanism, designed to ensure positive operation.

All switch fuse contacts shall be silver plated at the current transfer surfaces.

The unit shall be provided with a front operating handle. The ON and OFF positions of the switch handle shall be clearly marked.

5.2 Interlocks and Safety :

Interlocks shall be provided so as to prevent opening of the unit door when the switch is in the ON position and also to prevent closing of the switch with the door not properly secured. It should however be possible for a competent person to operate the switch shall be suitable for locking with switch in the OFF position by means of a padlock.

The interior arrangement of the switch fuse unit shall be such that all 'Live' parts are shrouded.

5.3 HRC Fuses :

The switch fuse units shall be fitted with High rupturing capacity cartridge fuse links with ISI marking for a rupturing capacity of not less than 80 KA at 415 volts. The fuse links shall be mounted in a drawout carriage, thus ensuring positive isolation of contacts during fuse replacements.

6.0 Current Transformers.

Current transformers shall comply with the requirements of relevant latest amendment IS. They shall have ratios, outputs and accuracy as specified in the schedule.

7.0 Indicating / Integrating Meters :

All indicating instruments shall be of flush mounted industrial pattern conforming to the relevant latest amended IS. The instrument shall have non reflecting bezels, clearly, divided and indelibly marked scales, and shall be provided with zero adjusting devices in the front. Integrating instruments shall be of flush mounted switch board pattern complying with the requirements of relevant latest IS.

8.0 Relays :Circuit breakers shall be provided with integrally mounted relays as specified in the schedule.

The relay shall have a set of three phase characteristics, which shall be adjustable over a wide range, to provide discrimination between a multiplicity of devices. The relay shall be able to provide over current and earth fault protection. Also UV and Shunt trip Relays are to be provided.

9.0 Control switches/Selector switches :Control switches/Selector switches shall be of the heavy duty rotary type, with plates clearly marked to show the operating position. They shall be of semi-flush mounted type with only the front plate and the operating handle projected.

Circuit breakers control switches shall be of the spring return to neutral type.

10.0 Indicating lamps and push buttons :

Indicating lamps shall be of the LED type of low watt consumption, provided with series resistors where necessary and with translucent lamp covers. Bulbs and lenses shall be easily replaceable from the front.

Push buttons shall be of the momentary contact, push to actuate type fitted with self-reset contacts and provided with plates marked with its junctions.

11.0 Cable terminations :

Cable entries and terminals shall be provided in the switch board to suit the number, type and size of aluminum conductor power cables and copper conductor control cables as indicated in the schematic diagram.

Provision shall be made for top or bottom entry of cables as required. Generous size of cabling chambers shall be provided, with the position of cable glands and terminals such that cables can be easily and safely terminated.

Barriers or shrouds shall be provided to permit safe working at the terminals of one circuit without accidentally touching that of another live circuit.

Cable riser shall be adequately supported to withstand the effects of rated short circuit currents without damage and without causing secondary faults.

Cable sockets shall be of copper and of the crimping type/soldering as required.

12.0 Control wiring :All control wiring shall be carried out with 1100/650 V grade single core Copper cable conforming to relevant IS having stranded copper conductors of minimum 2.5 sq.mm. section for CT Wiring and 1.5sq.mm for Control/indicating Instruments.

Wiring shall be neatly bunched, adequately supported and properly routed to allow easy access and maintenance.

Wires shall be identified by numbered ferrules at each end. The ferrules shall be of the ring type of non-deteriorating material. They shall be firmly located on each wire so as to prevent free movement.

All control circuit fuses shall be mounted in front of the panel and shall be easily accessible.

13.0 Terminal blocks and labels :

Terminal block shall be of 500 volts grade of the stud type. Insulating barriers shall be provided between adjacent terminals.

Terminal block shall have minimum current rating of 10 amps and shall be shrouded.

Provisions shall be made for label inscriptions.

Labels shall be made of anodized aluminum, with white engraving on black background. They shall be properly secured with fasteners. Danger plate of size and descriptions as recommended in the relevant IS shall be provided on the PCC.

14.0 Tests:

- i) The power control centre shall be completely assembled, wired, adjusted and tested for operation under simulated conditions to ensure correctness of wiring and interlocking and proper functioning of all components.
- ii) Each power control centre and components shall be subjected to standard routine tests as per applicable clauses of relevant standards.
- iii) All current carrying parts and wiring of power control centre shall be subjected to power frequency voltage withstand test.

15.0 Drawings :After the award of the contract the contractors shall submit three copies of the following drawings for approval of the Department.

- i) Outline dimensional drawing of the PCC showing the general arrangement indicating the following :
 - a) Busbar clearances;
 - b) power and control cable entry points;
 - c) Configuration of busbars;
 - d) Details of support insulations and spacings;
 - e) Outgoing power cable termination arrangements.
- ii) Single line diagram of power control centre showing Protection, Metering etc.
- iii) Cubicle wiring diagram.
- iv) List of Firements with Ratings & makes / Models

16.0 Installation Testing and commissioning :

The power control centre shall be installed over the cable trench/cable pit using suitable size of MS channel including grouting of the channel with necessary bolts and nuts. Proper earthing of PCC shall be done using two independent copper/GI strip of sizes as indicated in the schedule. The channel shall be painted with one coat of red oxide primer and two coats of anticorrosive enamel paint of proper shade as directed by the Engineer-in-charge.

The pre-commissioning tests as required shall be done and the PCC shall be commissioned.

CHAPTER 3 LAYING OF CABLES

1.0 Scope:

This specification is intended to cover the requirements of installation and energizing of PVC/XLPE/PILCDSTA power cables including jointing of cables.

2.0 Standards :

The power cable and its fixing accessories shall comply with the latest relevant Indian Standards and National Electrical Code.

3.0 Laying of Cables :

3.1 General :

3.1.1 Before the commencement of cable laying, it shall be ensured by the Engineer-in-Charge that only ISI marked cables are used. It shall be the responsibility of the contractor to check the soundness and correctness of the size of the cable while taking delivery of the cable from stores. Any defect noticed shall be brought to the notice of the issuing authorities immediately. If any defects is noticed after the cable is laid or during the process of laying, it shall be brought to the notice of the Engineer-in-Charge and upon his satisfaction, that the cable is not damaged due to bad handling, it will be the entire responsibility of the contractor to retrieve the cable already laid and return the defective cable to store and take fresh length of the cable from the store and relay the same.

3.1.2 The material such as bricks, sand, cable route markers, RCC slab of best quality as approved by the Engineer-in-Charge only shall be used for cable laying works.

3.1.3 The contractor shall provide all the necessary labour, tools, plants and other requisites at his own cost for carrying out pumping of water and removing of water from trenches, if any, where required.

3.1.4 Installation shall be carried out in a neat, workman like manner by skilled, experienced and competent workman in accordance with standard practices.

3.1.5 While laying the cable care shall be taken to avoid formation of kinks and also damage to the cable. In the case of cable bends, it shall not have bent radius lesser than 20 times the overall diameter of the cable.

3.1.6 A cable loop of about five meters length and as directed by the Engineer-in-Charge / APGVB shall be provided at the following locations.

- a) Near the termination points
- b) Near to the straight through joint

3.1.7 The method of cable laying and routing of cables, shall in every case be as directed by the Engineer-in-Charge / consultant / APGVB.

3.1.8 Whenever cable passes through hume pipes/GI pipes embedded across the wall in a building, both the ends of the pipe shall be suitably sealed.

3.1.9 Identification tags indicating the size of the cable and feeder designation shall be securely attached at both ends of the cable. Such tags shall also be attached to the cable at intervals of 50 Mtrs. The materials of the tag shall be of either 12 SWG GI sheet. In case of plastic, the details have to be engraved and incase of GI sheet, the details should be punched. Cable route markers shall be provided at the intervals of 200 M with a minimum of one number route marker. The details of the route makers shall be as per the drawing. At the locations of straight through joints, necessary joint-markers shall be provided.

3.1.10 When cable runs vertically, it shall be clamped on mild steel flats or angle iron fixed on walls and are spaced at such intervals as to prevent buckling of the cables. All steel work shall be painted with a coat of red oxide and thereafter finished with suitable anticorrosive paints.

3.2 Cable laid in ground :

3.2.1. All MV cables (up to 1.1 KV) shall be laid at a minimum depth of 0.75 M & HT cables (1.1 KV to 11 KV) shall be laid at a depth of 1.0 M when laid in ground. When cable pass through roads, nallahs etc. they must be protected by either hume pipe or GI pipe of suitable dimensions.

3.2.2. Excavations of trenches shall be carried out as indicated in the drawing. The width of the trench at the bottom shall be 0.4 M for one cable. In case the total number of cables laid in trenches is more than one, then the width shall be such that the spacing between the cables is maintained as shown in the drawing. Before the cable is laid in the trench the bottom of the trench shall be cleared from stones and other sharp materials and filled with sand layers of 75 mm, as shown in the drawing.

3.2.3. While removing the cable from the drum, it shall be ensured that the cable drum is supported on suitable jacks and the drum is rotated to unwind the cable from the drum. The cable should never be pulled while unwinding from the drum. It shall be ensured that the cables are run over the wooden rollers placed in the trench at intervals not exceeding 2 M.

3.2.4. After placing the cables in the trench shall be filled in layers ensuring that each layer is well rammed by spraying water and consolidated. The extra earth shall be removed from the place of trench and deposited at a place as directed by the Engineer-in-Charge/consultant / APGVB.

3.2.5. The HT cables shall be provided with RCC slabs (marked HT cable) on top as protection.

3.3 Cables laid in built up trench :

3.3.1. Before the commencement of cable laying the cable trench shall be drained properly. Cable shall be laid as explained in item 3.2. Cable shall be properly clamped to the cable supports, which are provided in the cable trench. The method of clamping shall suit the size of the cable and the cable supports, which are provided in the cable trench. The method of clamping shall suit the size of the cable and the cable supports, as directed by the Engineer-in-Charge / APGVB.

Care shall be taken while removing and replacing the trench cover slab. It is the responsibility of the contractor to make good any damaged trench covers.

3.4. Cable terminations and straight through joints :

3.4.1. All cable jointing materials such as straight through joint boxes, cable compound, cable lugs, insulation tapes etc. shall be of best quality and as approved by the Engineer-in-Charge / APGVB.

3.4.2. Cable glands for strip/armoured cables shall include a suitable armour clamp for receiving and securely attaching the armouring of the cable in a manner such that no movement of the armour occurs when the assembly is subjected to tension forces.

The cable gland shall not impose on the armouring, a bending radius not less than the diameter of the cable. The clamping ring shall be solid and of adequate strength.

Provision shall be made for attachment of an external earthing bond between the metallic covering of the cable and the metallic structure of the apparatus to which the cable box is attached.

3.5 Sealing boxes :

3.5.1 A sealing box, irrespective of the class of insulation of the cable for which it is intended, shall be so designed that it may be filled with compound after connecting the cable specially in flame proof/hazardous areas.

3.5.2 All parts and connection for attaching the armouring, wiping or clamping the metallic sheath in a sealing box, shall be easily accessible. This may be achieved by splitting the box or by providing a suitable cover or other such means.

3.5.3 The joints in the box shall prevent leakage of the compound.

3.5.4 Provision shall be made to ensure that the cores of the cable are efficiently sealed to prevent moisture penetrating along the strands or the cable conductors.

3.5.5 The sealing box shall be provided with compound filling orifices with suitable covers or plugs of size that will permit easy pouring of the compound.

In all cases where screwed plugs are used, one or more air vents shall be provided to ensure complete expulsion of air and total filling of the box with compound.3.5.6 The box shall be of sufficient length to allow for manipulation of the insulated cover without damage to them or to the insulation.

3.5.7 A sealing box intended to be attached directly to the apparatus shall be designed such that the box together with the connected cable may be detached from the apparatus without disturbing the sealing compound.

3.5.8 Cable sealing and dividing boxes intended for use in the flame proof areas shall comply additionally with the relevant requirements of IS:2148-1968.

4.0 Testing

Once cable is laid, following tests shall be conducted in the presence of Engineer-in-Charge, before energizing the cable:

- i) Insulation resistance test (Sectional and Overall).
- ii) Sheathing continuity test.
- iii) Continuity and conductor resistance test.
- iv) Earth test.
- v) High voltage test.

Tests conducted shall be as per Indian Standards and National Electrical Code.

CHAPTER 4 EARTHING

1.0 SCOPE:

This specification is intended to cover the requirements of supply, installation, testing and commissioning of

- a) Pipe earthing
- b) Plate earthing
- c) Strip earthing

2.0 STANDARDS:

Earthing installations shall conform to the Indian Electricity Rules - 1956, as amended from time to time and IS 3043-1989 "code of practice for earthing", with latest amendments.

3.0 Earth electrode arrangement :

3.1 Pipe electrode :

3.1.1 Electrode shall be made of CI pipe having a clean surface and not covered with paint, enamel or poorly conducting material. Galvanized pipe shall not be smaller than 100 mm ID. Earthing with pipe electrode shall be done as per the details indicated in IS : 3043/87 .

3.1.2 Electrodes shall be embedded below permanent moisture level.

3.1.3 The length of pipe electrodes shall not be less than 2.5 m. if rock is encountered, pipes shall be driven to a depth of not less than 2.5 m with suitable inclination. Pipe shall be in one piece and deeply driven.

3.1.4 To reduce the depth of burial of an electrode without increasing the resistance, a number of rods or pipes may have to be connected together in parallel. The distance between two electrodes in such a case shall not be less than twice the length of the electrode. The earthing lead shall be connected by means of a through bolt, nuts and washers and cable socket.

3.2 Plate electrode :

For plate electrodes, minimum dimensions of the electrode shall be as under.

3.2.1 GI plate electrode : 600 x 600 x 6 mm thick.

3.2.2 Copper plate electrode : 600 x 600 x 3.15 mm thick

3.2.3 The electrode shall be buried in ground, with its faces vertical and top not less than 2.5 M from the surface of the ground.

3.2.4 Earthing using plate electrode shall be done as per details, indicated in drawing.

3.2.5 Plate electrodes shall have a galvanized iron water pipe, buried vertically and adjacent to the electrode. One end of pipe shall be at least 5 cm above the surface of the ground and need not be more than 10 cm. The internal diameter of the pipe shall be at least 19 mm. The length of pipe under the earth's surface shall be such that it shall be able to reach the center of the plate. The earthing lead shall be securely bolted the plate with two bolts, nuts, check nuts and washers.

3.3. Strip or conductor electrodes :

3.3.1. Strip electrode shall not be smaller than 25 x 1.6 mm, if of copper and 25 x 3 mm, if of galvanized iron and steel. If round conductors are used as earth electrodes, their cross sectional area shall not be smaller than 3 sq.mm , if of copper and 6 sq.mm. if galvanized iron and steel.

3.3.2. Conductor shall be buried in trenches not less than 0.5 m deep.

4.0 General :

- i) All materials used for connecting the earth lead with electrode shall be of GI in case of GI pipe

and GI plate electrodes, and of tinned brass in case of copper plate electrode. The earthing lead shall be securely connected at the other end to the main board.

ii) The earthing lead from electrode onwards shall be suitably protected against mechanical injury by routing the earth wire / strip through a suitable size of GI pipe.

iii) All medium voltage equipments shall be earthed by two separate and distinct connections with the earth. In the case of high and extra high voltages, the neutral points shall be earthed by not less than two separate and distinct connections with the earth, each having its own electrode at the generating station or substation.

iv) All materials, fittings etc. used in earthing shall conform to Indian standard specifications wherever they exist. In the case of materials for which Indian standard specifications do not exist, such materials shall be approved by the Engineer-in-Charge.

v) The earth electrode shall be kept free from paint, enamel and grease.

vi) It shall be ensured that similar materials for respective earth electrodes and earth conductors are used.

vii) Earth electrode shall not be installed in proximity to a metal fence.

viii) Copper/GI strip shall be connected to the respective earth electrodes, either by brazing or welding respectively. The Copper/GI strip shall be jointed only either by brazing or by riveting at the end of over lapping portions. The over lap shall not be less than 50 mm.

ix) Earthing clamps used for supporting earth strips shall be made of such materials so as to avoid bimetallic action between strip and clamps.

5.0 Testing :

The earth resistance of each electrode shall be measured by using a reliable and calibrated earth megger and the value shall be as per IS/IE rules .

LIST OF I.S.CODES FOR INTERNAL ELECTRIFICATION INSTALLATIONS

B.

- | | | |
|-----|--|------------------|
| 1. | EXTERNAL ELECTRIFICATION wiring installation
(system voltage not exceeding 650V) | IS 732 – 1989 |
| 2. | Graphical symbols used in Electro-technology
art-XI-Electrical Installation buildings | IS 2032-1969 |
| 3. | Fire safety of buildings (General) Electrical Installation | IS 1646-1961 |
| 4. | 3 pin plugs and sockets | IS 1293 |
| 5. | Earthing. | IS 3043-1966 |
| 6. | Rigid steel conduits for electrical wiring | IS 9537-PII-1989 |
| 7. | Fittings for electrical wiring | IS 2667-1964 |
| 8. | Flexible steel conduits electrical wiring | IS 3430-1966 |
| 9. | Accessories for rigid steel conduit insulated cables | IS 3837-1966 |
| 10. | General and safety requirements for electric lighting fittings | IS 1913-1969 |
| 11. | Protecting of buildings and allied structures against
lightning | IS 2309-1967 |
| 12. | Busbar ratings | IS 8084-1976 |
| 13. | On load change over switches | IS 4064-1978 |

A B S T R A C T

1. Name of the work : **INTERIOR FURNISHING, ELECTRICAL & AIR CONDITIONING WORKS FOR BANK OF BARODA, PUNGANUR BRANCH AT PUNGANUR, CHITTOR DIST, AP.**
2. Earnest Money Deposit : **Rs. 25,000.00**
3. Date of Commencement of work : From date of marking at site.
4. Period for Completion : 30 DAYS
5. Value of work to be taken for issue of Interim Certificate for payment : No advance payment
6. Retention percentage to be deducted from RA Bills. : 10% of the gross value of Bill
7. Total Security Deposit : as per clause No: 10(page 6)
8. Defect Liability Period : 12 months from completion.
9. Refund of Security Deposit : After completion of defects liability period.
10. Liquidated Damages : 1% per week
Maximum of 10% of contract value/final bill amount.
12. Period of Final Measurements : 30 days.
13. Period of honouring Interim / Certificate for payment. : 15 days.
14. Period of honouring final Certificate for payment. : 30 days.
15. Time of completion : 30 days.

MODE OF MEASUREMENT

(a) Full Height Partitions	:	Sft. Area-one side only Finished length x finished height.
(b) 4'-0" Height Partitions	:	-do-
Tables & Side Units	:	Each. Per No.
Running Table	:	Rft.
Rolling Shutter	:	SFT – Finished length x Finished Height.
(a) False ceiling	:	SFT. Area-Finished length x finished width (No deductions for light fittings, AC Grills, cutouts etc.(Height till bottom of the false ceiling but strength to be given from slab)
Wall Cladding	:	SFT. Area-one side only Finished length x Finished height.
Painting of walls	:	SFT. Area-Finished length x Finished height
Vertical Blinds	:	SFT. Area-Finished length x Finished height of venetian blinds.
Main Door	:	SFT. Finished Length x Finished Height.

PREAMBLE TO BILL OF QUANTITIES

1. Quantities mentioned are approximate and payment shall be made on actual measurements. There shall be no claim whatsoever for variations in quantities at the time of actual execution.
2. The rate of partitions and wall cladding shall include necessary additional framework supports wherever required to suit the site conditions or stability of the frames.
3. Rate for doors will include provision of Hardware like brass hinges, locks, handles, tower bolts, door stoppers etc., of approved design and make.
4. Rates for hardware to include supplying and fixing of necessary matching screws (Brass or powder coated)
5. The rates for provisions of furniture shall include for placing the required furniture in position and protecting from damage until handing over to the Bank.
6. The rates for all painting and polishing works shall include all preparation of surfaces, sand papering or rubbing down before each coat, all brushes and cleaning materials.
7. After completion of the work the site shall be cleared from all waste, rubble, left over materials etc., and thoroughly cleaned ensuring that all laminates, flooring, walls, furniture surfaces and tops etc., are spotless clean.
8. The aluminum-extruded sections shall generally confirm to dimensions given in the drawings and specifications, correspondingly ensuring the minimum weight structure as specified in manufacturer's catalogue.

**APPROVED MAKES LIST OF APPROVED MAKES FOR INTERIOR
FURNISHING WORKS**

Sno	Materials	Approved Make / Brands
1	Plywood (BWP Ply) IS 710 grade only.	Greenply (Gold Platinum) / Archid(Classic) /Century Ply (Club Prime) / Nicon Ply (Club) / Mayur Ply(Royal Ply)
2	Glass	Asahi, Modi, Saint Gobain
3	Door Closers, Floor Spring, Pivot, Patch fittings, Hinges, Mortise door locks, Door handles, Tower bolts.	Dorma, Enox, Kich, Ozone, Dorset.
4	Gypsum Board	INDIAN GYPSUM LTD., Saint Gobain, Diaken
5	Mineral Fiber False Ceiling Tiles	Armstrong, Us Boral, Rock strength
6	Particle Board	Ken Board, Euro Board
7	Veneer (Natural) - 4 Mm Thick	Samrat, Century, Archid/ Merino
8	Laminates	Century Mica, Greenlam, Merino, Royal Crown, Bravia
9	Adhesive	FEVICOL, Vamicol, Araldite
10	Cabinate Handles, Locks , Hinges.	Dorma, Enox, Kich, Ozone, Dorset, Ebco.
11	Sliding Channels	Earl Bihari, Everite
12	Roller Blinds	VISTA LEVOLOR, Mac, Hunter Douglas
13	Beach Wood	As approved by Architect.
14	Flush Door – Confirming To IS : 2202 (Part – 1) – 1991	Green Ply/ EGG Wood/ Rama/ Nicon
15	Metal studs	Gyproc, USG Boral, British gypsum saint gobin.
16	Supporting system for Ceiling	Gyproc, USG Boral, British gypsum saint gobin.
17	Plaster Boards	LAGYP/ Saint Gobain Make / Us Boral
18	Soft Board	Jolly Board
19	Screws	GKW/ Nettlefold
20	Paint	Asian Paints, Nerolac, Nippon, Berger.
21	Writing Board	White Marlk
22	Mobile pedestal	Godrej, Featherlite, Steelcase.
23	Keyboard tray, Metal foot rest, CPU Trolley	Ebco, Steelcase.
24	Acrylic solid surface	Dupoint, Merino, LG, HI-Macs.

Note: The tenderer shall ensure that only approved materials are used. Where necessary he may have to produce proof of using approved makes through original receipts, letter from the manufacturer or authorized dealer etc. Though choices are mentioned above, please note that the Consultant/ Bank reserves the right to choose

APPROVED MAKES
LIST OF APPROVED MAKES FOR ELECTRICAL WORKS

S.No.	Material Name.	Approved Make / Brands
1.	Switches/Sockets/Fan Regulators/Front.	MK India (MK blenz) / Legrand(myrius) /Havells Crabtree (Verona)/Wipro North west (nowa)
2.	Telephone/Computer and LAN Sockets	Legrand /Havell/ AMP/Systimax/Panduit
3.	Cables/Copper Conductor wires	Finolex / Polycab / Havells
4.	PVC conduits & Accessories	Precision (Dt) / Sudhakar/ Avon plast /Mecury / VIP.
5.	MS Conduits & Accessories	Gupta / Bharat / BEC.
6.	Metal clad Sockets	MDS / Clipsal / BCH / Legrand.
7.	MCBs / RCBO / RCCBS / MCB Distribution boards	L&T- Hager / Schneider/ BCH / Siemens / ABB / Legrand.
8.	MCCBs/Switchgear	L&T- Hager / Schneider/ BCH / Siemens / ABB / Legrand.
9.	Under ground Cables	polycab / finolex / Havells
10.	Cable Glands	HMI /Comet /Havells
11.	Capacitor Bank	Epcos /Neptune / Siemens.
12.	Cable Lugs	Dowell's / 3D /Havells
13.	MV Panels (PCCs)	Manufacturers with CPRI Test Certificate.
14.	ELRs/CBCT	Prokdvs /Nagoba
15.	Krone box	Krone,
16.	Indication Lamps LED (protected type)	Schneider / Vaishno / Binay
17.	Resign cast CTs	AE / Kappa
18.	CAT6 / RG 6 / RG 11	Legrand /Havell/ AMP/Systimax/D-Link
19.	LAN (RJ45) Sockets	Legrand /Havell/ AMP/Systimax/D-Link
20.	Light Fixtures	Philips / Wipro / Havells /Crompton
21.	Ceiling Fans & Exhaust Fans	Crompton Greaves or Equivalent

Note: The tendere shall ensure that only approved materials are used. Where necessary he may have to produce proof of using approved makes through original receipts, letter from the manufacturer or authorized dealer etc.Though choices are mentioned above, please note that the Consultant / Bank reserves the right to choose.

APPROVED MAKES
LIST OF APPROVED MAKES FOR LAN WORKS

S.Nos.	Name of the materials	Approved make.
1.	Cat6 E UTP cable	Legrand/Havell/AMP/D-link
2.	PVC casing/pipe/flexible pipe	Modi/sudhakar/ VIP/ Universal
3.	Cat6 24-Port jack Panel	Legrand/Havell/AMP/D-link
4.	Cat6 Information out Let, Faceplate with SMD	Legrand/Havell/AMP/D-link
5.	Cat6 Mounting Cord 3ft (1Mtr) Factory made	Legrand/Havell/AMP/D-link
6.	Cat6 Mounting Cord 7ft (1Mtr) Factory made	Legrand/Havell/AMP/D-link
7.	9U Communication Rack with Cable Manager, Cantilever shelf, Power manager, mounting fasteners pack of 20, Front Glass Door and Lock	Legrand/Havell/AMP/D-link

Note: The tendere shall ensure that only approved materials are used. Where necessary he may have to produce proof of using approved makes through original receipts, letter from the manufacturer or authorized dealer etc. Though choices are mentioned above, please note that the Consultant / Bank reserves the right to choose.

APPROVED MAKES
LIST OF APPROVED MAKES FOR AIR CONDITIONING WORKS

S.No.	Material Name.	Brand / Manufacturer / Recommended Make.
1.	CASSETTE AND HI WALL UNITS.	O-General, Daikin, Carrier, LG, Voltas, Blue Star, Mitsubishi Heavy and Hitachi
2.	GI Sheets	TATA / HSL / SAIL / NIPPON DENRO or approved equivalent.
3.	Fire Damper	Caryaire / AirMaster / Air Breeze / Ravistar or approved equivalent.
4.	Vibration Isolators / FlexibleConnectors	Resistoflex / Dunlop or approved equivalent.
5.	INSULATION / Fibre glass.	UP Twiga / Kimmco / Owens corning or approved equivalent.
6.	Power Cables	CCI / ICC / Gloster / UCL or approved equivalent.
7.	Cables	Finolux / RR cables / polycab/finocab
8.	Aluminum Grilles Diffusers /Linear Grilles	Caryaire / Air Master / Air Breeze/SRIFABS or approved equivalent.
9.	Filters	Klenzaid / Airtech / Aerosol / Anfilco or approved equivalent.
10.	Cooling Coils / Heating Coils	Bluestar / Rohini / Ethos / Carrier / Jaypee / Coil Company / ZECO or approved equivalent.
11.	Nitrile rubber	Armaflex / k flex

Note: The tendere shall ensure that only approved materials are used. Where necessary he may have to produce proof of using approved makes through original receipts, letter from the manufacturer or authorized dealer etc. Though choices are mentioned above, please note that the Consultant / Bank reserves the right to choose.

DECLARATION

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 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.

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: _____