

## ACCEPTANCE FORM

**PROJECT:                    MODIFICATION OF EXISTING A-320- SIMULATOR I  
BUILDING TO ACCOMMODATE ATR 72-212 SIMULATOR AT  
CTE, FEROSGUDA. HYDERABAD – ELECTRICAL WORKS**

**REF                                : HYD/CTE/PFD/115/ELEC/418 Dated 20.04.2017**

Dear Sirs,

I/We the undersigned have carefully gone through and clearly understood after visiting the site and the Tender drawings and tender documents comprising of the tender form, Notice to contractors, and conditions for building contract, Special Conditions, Specifications and Schedule of Probable quantities and Draft Agreement prepared by your Architects                    M/s MURTY & MANYAM, Architects & Engineers, Hyderabad.

I/We do hereby undertake to execute and complete the whole or part of the work (as desired by you) at the respective rates which I/We have quoted for the respective items of the Probable Bill of Quantities and at which rate the items specified amount to Rs.38,31,070 , approx .

I/We are depositing as Earnest Money a sum of **Rs. 95,777/-** by demand draft/Bankers cheque drawn on any scheduled bank payable at Hyderabad in favor of Air India Limited along with this tender for due execution of the work at my/our tendered rates together with any variations which shall be adjusted by the Architects at prices based on our tendered rates.

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

I/We further agree to complete the work covered in the said schedule of quantities in **3 months** from the reckoned from the date of issue of the work order to commence the work or on which contractor is instructed to take possession of the site, whichever is later.

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

I/We agree to pay the Government, General and Sales Tax (State and Central), Excise and Octroi duties, Insurance, labour cess and all other taxes including works contract tax etc., as the prevailing from time to time, on such items for which the same are leviable, and to get the work, workers, employees (of contractor, Architect & Employer) engaged on the work at site and all materials at site for execution of the work shall be insured comprehensive insurance including fire/accidents/ rain/ floods/riots/CAR policy (contractor's all risk insurance policy) and the insurance shall cover the period from date of start of work to date of actual completion of work plus 3 months. In case part work is taken over by the Employer before final completion of the whole work, such parts may not be covered by the insurance from the date of taking over that part of work by the Employer. Draft Insurance deed will be got vetted by the Architect, before obtaining the same. All the rates quoted by me/ us are inclusive of the same in full and nothing extra shall be claimed anytime on account of any of these.

I/We agree for all statutory deduction i.e Income tax, works & contract tax (VAT) at applicable rates from the bills payable to me. The rates quoted by me are inclusive of the same to be deducted at source, at the rate prevailing from time to time on the Gross value of the work done, and the rates quoted by me/we are inclusive of same.

I/We agree for seigniorage fee to be deducted at source, at the rates prevailing from time to time as per AP Govt. Act, as amended and rates quoted by me/us are inclusive of the same.

Yours faithfully,

Contractor's Signature

Address:

Date:

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## NOTICE TO CONTRACTOR

ADDRESS:

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**PROJECT:                    MODIFICATION OF EXISTING A-320 SIMULATOR I  
BUILDING TO ACCOMMODATE ATR 72-212 SIMULATOR AT  
CTE, FEROSGUDA. HYDERABAD – ELECTRICAL WORKS**

**REF                            HYD/CTE/PFD/115/ELEC/418 Dated 20.04.2017**

1. SIMULATOR HALL
2. EMM ROOM
3. COMPUTER ROOM

Dear Sirs,

1. On behalf of our clients, **AIR INDIA LTD**, Central training establishment, Hyderabad, we have pleasure in inviting you to tender for the aforesaid work.
2. The scope of work broadly as given below is for **Modification of Existing A-320 Simulator I Building to accommodate ATR 72-212 simulator at CTE Ferozguda, Hyderabad-500 011-Electrical Works**
3. Tender Documents shall be downloaded from Air India Limited web site [www.airindia.in](http://www.airindia.in) with effect from 20.04.2017 to 03.05.2017. After downloading the prospective bidders shall attend the Pre-bid meeting at on 11:30 - 13:00 hrs in the office of Senior Manager , P& F at Air India Limited ,CTE, Ferozguda ,Hyderabad-500 011 on 04<sup>th</sup> May 2017.

**ELIGIBILITY CRITERIA:** The tenderer shall submit the following copies of the documents in support of their eligibility in envelope-I ;

- 1) Copy of work order and work completion certificate having carried out similar works during the last 5 years
  - a) One work of 80% of estimated cost.
  - b) Two works of 60% of estimated cost.
  - c) Three works of 40% of estimated cost.

- 2) Valid “A” grade Electrical Contractors licence issued by Electricity Board
- 3) Copy of list of works on hand.
- 4) Latest IT Clearance Certificate & Copy of PAN Card.
- 5) Copy of ESI & PF Certificates

Additional Information:

- a) Copy of Registration Certificates, if any.
- b) List of qualified Technical Personnel.
- c) List of Tools & Plants.
- d) Audited Balance Sheet for the last three years.

4. Sealed tenders in the prescribed form, in a sealed envelope should be **addressed to Sr.Manager(P&F), Air India Ltd, Ferozguda, Hyderabad- 500 011.**

a. **Envelope No.1:** : To contain A) Demand Draft/Banker’s cheque for **Rs. 95,777/-** as EMD & DD for **Rs.1000 /-** towards cost of tender drawn in favour of Air India Limited, and Acceptance form.

B) Tender document duly signed

C) Eligibility credentials including work orders and completion certificates.

b. **Envelope No.2 :** Only Price bid i.e BOQ completed in all respects and duly **Signed.**

Sealed tenders shall be submitted in the **office off Sr.Manager (P&F),Air India Limited, CTE ,Ferozguda,Hyderabad-500 011** not later than **15.00** hours on 8<sup>th</sup> May 2017. Envelope No.1 will be opened on the same day at **15.30** hours in the presence of the contractors, who may be present. Envelope No.2 will be opened on 11<sup>th</sup> May 2017 or any other day which will be notified to the qualified bidders in technical evaluation.

Conditional Tenders If any submitted by tenderers will not be accepted.

5. The tenderer must obtain for himself, on his own responsibility and at his own expenses, all the information which may be necessary for the purpose of filling this tender and for entering into a contract for the execution of the same and must examine the drawings and inspect the site of the work and acquaint himself with all local conditions and matters pertaining thereto.
6. Each of the tender documents page is required to be signed by the person or persons submitting the tender in token of his/their having acquainted himself/themselves with the General conditions etc., as laid down. Any tender with any of the documents not so signed will be rejected.
7. The tender documents must be filled in English and all the entries must be made by hand and written in ink. All rates shall be quoted in figures and words. If any item is not quoted or left blank (“rate” and “Amount” columns), the tender will be treated as incomplete tender and is liable for rejection. If any of the documents are missing or un-signed, the tender shall be considered invalid.
8. Each and every one of all erasures and additions/alterations made, while filling the tender, must be attested by initials of the tenderer. Over-writing of figures must be

attested by initials of the tenderer. Overwriting of figures is not permitted. Failure to comply with either of these conditions will render the tender void. After submission of the tender no advice or any change in rate or conditions will be entertained. All the rates should be quoted both in figures and words. In-case of any discrepancy in rates quoted in words/figures and the amounts, the rate quoted in words shall be taken as final and binding.

9. The tender shall be valid for a period of 90 days from the date of opening the Envelope No.1

10. TOTAL SECURITY DEPOSIT: shall comprise of:

- a. Earnest Money deposit
- b. Initial Security deposit
- c. Retention money

10.1 EMD amount shall be forfeited as liquidated damages, in the event of any evasive/direct refusal or delay in starting the work and or signing the contract. The deposit of the unsuccessful tenderers will be returned, without interest, immediately after a decision is taken regarding the award of the contract. The Earnest money of the successful tenderer will be adjusted

towards Security Deposit. A tender not accompanied by Earnest money deposit will not be considered. No concession will be made to Public sector companies from payment of earnest money deposit.

10.2 Together with the Earnest money Deposit , further retention of 10% of the value of the work done will be deducted from every running bill, till total retention, including EMD and initial SD paid earlier, comes to 10% of the contract value, and same shall be held by the Air India Ltd. as Total Security Deposit. On the Architect's certifying the completion of work, (Virtual completion) 50% of the total security deposit shall be released to the contractor alongwith the final certificate of payment, and the balance amount will be retained in the manner stated elsewhere for a further period of twelve months after the completion date recorded in completion certificate, issued by the Architects and agreed to Air India . Also refer condition 22(ii) on Page 7 of Volume 1.

11. Within two weeks of the receipt of intimation from the Architects of the acceptance of his/their tender, the successful tenderer shall be bound to sign an agreement, on a stamp paper in accordance with the Draft Agreement and conditions of contract attached herewith, but the work order or the written acceptance of a tender by the Employer will constitute a binding agreement between the Employer and the person tendering whether such formal contract is or not signed by the contractor.

12. All compensation or other sums of money payable by the contractors to the clients, under the terms of this contract, may be deducted from the Security Deposit or from any sum that may be or may become due to the contractor on any account whatsoever, and in the event of the Security deposit being reduced by reasons of any such deductions, the contractor shall within 15 days of being asked to do so make good in cash or cheque, any sum which have been deducted from his security deposit.

13. The contractor shall arrange for the procurement of all the materials at site as required and directed, and store them in their godown at the site of construction, and also bear all the expense incurred in connection therewith, including payment of taxes, octroi, storage, watch and ward etc.
14. The rates quoted by the Contractor shall include all eventualities, such as heavy rain, sudden floods, accidents, fire, riots etc., which may cause damage to the executed work or which may totally wash out the work. Until the completion certificate is issued to the Contractors, neither the Architect nor the clients will be responsible for such damage or wash out of the construction work.
15. Time is the essence of the contract. The work should be completed in **3 months**, from the date of commencement. The date of commencement shall be
  - a) The day two weeks from the date of issue of work order.

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

Or
  - c) The contractor is asked in writing to take over the possession of the site. The successful contractor will have to give a CPM/PERT chart of various activities of work to be done so that the work gets completed within the stipulated time. The chart shall be submitted within 15 days from the date of acceptance of the tender.
16. Time is the essence of the contract and if the contractor fails to complete the work by the Scheduled date of completion or within any sanctioned extended time, he will have to pay liquidated damages at the rate of ½% of contract amount for each week of delay the work remains incomplete beyond the completion (Original/extended date), subject to maximum of 10% of the contract value (without extra items) as per clause 33 of the General conditions of contract.
17. The quantities contained in the Schedule are only indicative. The work as actually carried out and done will be measured up from time to time, for which payment will be made subject to the terms and conditions of contract.
18. The unit prices shall be deemed to be fixed prices. In case of extra items, a record of labour charges paid shall be maintained and shall be presented every month for extra/substituted items regularly to the Architects for checking. The settlement will be made based on figures arrived at jointly and taking into account unit prices of items of work mentioned in the contract assigned to the successful tenderers. In case, of extra items, where similar or comparable items are quoted in the tender, extra rates shall invariably be based on those tender rates to the extent reasonable.

19. Our clients, Air India Ltd. Hyderabad, do not bind themselves to accept the lowest or any tender and reserve to themselves the right to accept or reject any or all tenders, either in whole or in part, without assigning any reason whatsoever for doing so.
20. No employee of the Air India is allowed to work as a contractor for a period of two years of his retirement from service, without the previous permission of the company. This contract is liable to be cancelled, if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of the company as aforesaid before submission of the tender or engagement in the contractor's service.
21. The tenderer, apart from being a competent contractor must associate himself with agencies of the appropriate class who are eligible to tender for (1) Electrical (2) Sanitary & Water Supply installations and (3) Horticulture (4) Airconditioning works (5) Fire fighting systems & (6) Interiors (fixed furniture), as the case maybe.
22. Release of security deposit:
  - i) 50% of the total security deposit will be released along with the final certificate of payments as stipulated under para 9 on page 10 of Volume I, Appendix to General Conditions of contract,
  - ii) Balance 50% of Retention money will also be released as noted under (i) above on completion of defects liability period of 12 months.

**ARCHITECTS:**

MURTY & MANYAM  
Architects & Engineers  
859, Banjara Avenue  
6-3-597/A/12/A/68  
Hyderabad – 500 004.  
Tel: 23318020, 23301138,

## ARTICLES OF AGREEMENT

ARTICLES OF AGREEMENT made the \_\_\_\_\_ day of \_\_\_\_\_ 2017 between

\_\_\_\_\_

of \_\_\_\_\_

(Hereinafter called the "Employer") of the one part and \_\_\_\_\_ of \_\_\_\_\_ (hereinafter called "The Contractor") of the other part, where as the Employer is desirous of getting the work of "\_\_\_\_\_"

executed and has caused drawings, conditions of contract, specifications and schedule of quantities etc., describing the works prepared by M/s MURTY & MANYAM, Architects & Engineers, Hyderabad.

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

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

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the said sum to be paid at the times and in the manner set forth in the said conditions, the contractor shall upon and subject to the said conditions, execute and complete the work shown in the said drawings and described in the said specifications.
2. The Employer shall pay the contractor the said sum or such sums as shall become payable hereunder at the times and in the manner specified in the said conditions.
3. The term "Architect" in the said conditions shall mean the said M/s Murty & Manyam, Architects & Engineers, or in the event of their ceasing to be the Architect for the purpose of this contract, such other person as shall be nominated for that purpose by the Employer, not being a person to whom the contractor shall object for reasons considered to be sufficient by the Arbitrator mentioned in the said conditions provided always that no persons subsequently appointed to be the Architect under this contract shall be entitled to disregard or over-rule any previous decision or approval or direction given or expressed by the Architect for the time being.
4. Tender documents containing work order Notice to the Contractor, Conditions of Contract, Appendix thereto, Special Conditions of Contract, Specifications and Schedule of Quantities with the rates entered therein, shall be read and studied as forming part of this agreement and the parties hereto shall respectively abide by and Submit themselves to the conditions and stipulations and perform the agreement on their part respectively in such conditions contained.

EMPLOYER

CONTRACTOR



5. The contract is neither a fixed lumpsum contract or a piece work contract, but is a contract to carry out work in respect of the entire works to be paid for according to actual measured quantities, including variations from BOQ at the rates contained in the Schedule of rates and Probable bill of quantities or as provided in the said conditions.
6. The Employer through the Architect, reserves to himself the right of altering the drawings and natures of the work, of adding/substitution to or omitting any items of work or having portions of the same carried out through alternate agencies without prejudice to this contract.
7. Time shall be considered a the essence of this agreement and the contractor hereby agrees to commence the work soon after the site is handed over to him but within 15 days reckoned from the date of issue of work order to execute the work, as provided for in the said conditions and complete the entire work in **3 months** subject to nevertheless to the provisions for extension of time.
8. This agreement and contract shall be deemed to have been made in Hyderabad and any questions or dispute rising out of or in any way connected with this Agreement and Contract shall be deemed to have arisen in Hyderabad and only the courts in Hyderabad shall have jurisdiction to determine the same. The limitation period will be 90 days from the date of dispute having arisen.

AS WITNESS our hand this \_\_\_\_\_ day of \_\_\_\_\_ 2017

Signed by the said in the presence of:

WITNESS: SIGNATURE

NAME :

ADDRESS: \_\_\_\_\_ EMPLOYER

WITNESS: SIGNATURE

NAME :

ADDRESS:

**APPENDIX TO GENERAL CONDITIONS OF CONTRACT**

1. Earnest Money Deposit (EMD) : Rs. 95,777/-

EMPLOYER

CONTRACTOR

2. Period of completion : 3 Months
3. Defects Liability period : 12 months after completion as recorded in the completion certificate.
4. Agreed Liquidated Damages : ½% of contract amount per week of delay subjected to a maximum of 10% of contract value.
5. Period of final measurement : Three months after completion as recorded in the completion certificate.
6. Minimum value of work to be Executed for issue of interim Certificates for making payment : Minimum Rs.10.00 Lakhs. Total number of bills to be submitted is 4 including final bill
- 7.a) Retention money from each bill : 10% of gross value of each interim bill, subject to 8(b) below.
- b) Total retention money including Earnest money and initial security Deposit : 10% of the contract value.
8. Release of Security deposit after Virtual completion. : 50% of the total security to be released along with final certificate of payment, but only after removing all his materials, equipment, labour, huts/force, temporary sheds/stores, all his installations, machinery etc., from the site. Balance payment to be released after the completion of defects liability period of 12 months..
9. Period for honouring certificate : 15 working days from date of Architects certificate of payment for interim bills and 90 days for final certificate.

WITNESS :

DATE : SIGNATURE OF THE CONTRACTOR WITH DATE

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EMPLOYER

CONTRACTOR

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## **GENERAL CONDITIONS OF CONTRACT**

### **1. INTERPRETATIONS:**

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

- a. "Employer" shall mean Air India Ltd, Ferozguda, Hyderabad and shall include his/their heirs, legal representatives, assignees and successors.
- b. "Contractor" shall mean \_\_\_\_\_  
\_\_\_\_\_ and shall include his/their heirs, legal representatives, assignees and successors.
- c. "Air India Engineer" shall mean any Engineer who is employed by Air India Ltd or any other Engineer appointed from time to time by the Employer, and certified in writing to the Architect and the contractor, to act as Engineer for the purpose of the Contract in place of the said engineer.
- d. "Employer's Representative" shall mean Project Management Consultants employed by the Air India Ltd./any assistant of the Engineer or any site engineer/ PMC appointed from time to time by the employer to perform the duties set forth in clause 17 hereof whose authority shall be notified in writing to the Architect and Contractor by the EMPLOYER.
- e. "Architects" shall mean any Engineer/ representative appointed by M/s Murty & Manyam, Hyderabad.
- f. "Works" shall mean the works to be executed in accordance with contract specifications, quantities etc.
- g. "Contract" shall mean the Articles of Agreement, the General Conditions, Special Conditions, the Appendix, the Schedule of Quantities, Specifications and drawings, work order etc., attached hereto and duly signed.
- h. "Contract Price" shall mean the sum named in the tender, subject to such amount additions thereto or deductions there from as may be made under the provisions, hereinafter contained.
- i. "Site" shall mean the lands and other places as shown on the site plan, on which the works are to be, provided, by the Employer or Architect for the purpose of the Contract.
- j. "Drawings" shall mean the drawings referred to in the contract etc., and any modifications of such drawings approved in writing by the Architect and the Air India and such other drawings as may from time to time be furnished or approved in writing by the Architect and Employer.
- k. "Notice in Writing" or written notice shall mean a notice in writing, typed or printed characters sent (unless delivered personally or otherwise provided to have been received) by registered post to the last known private or business

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

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

2. **SCOPE OF CONTRACT:**

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

- a. The variations or modifications of the designs, quality or quantity of works or the addition or omission or substitution of any work.
- b. Any discrepancy in the drawings or between the Schedule of Quantities/ or drawings and/or specifications etc.
- c. The removal and/or re-execution or any works executed by the contractor.
- d. The removal from the site of any material brought there on by the contractor, and the substitution of any other material there from.
- e. The dismissal from the works of any person employed thereupon.

- f. The opening up for inspection of any work covered up.
- g. The amending and making good of any defects under clause 24 “Removal of Improper works and Materials”.

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

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

### 3. **DRAWINGS AND SPECIFICATIONS:**

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

No drawing shall be taken as in itself an order for variation, unless in addition to the Architect’s signature, it bears express works stating that it is intended to be such an order or bears a remark “VALID FOR CONSTRUCTION”. No claim for payment for extra work shall be allowed, unless the said work shall have been executed under the

provisions of clause 8 (Authorities, notices, patents, rights and royalties) or by the authorities, of directions in drawing of the Architect as herein mentioned.

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

Please refer clause 36 of Special conditions of contract.

4. **SCHEDULE OF QUANTITIES:**

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

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

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

The 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 prices stated in the schedule of Quantities and/or the Schedule of Rates and Prices, which rates and prices shall cover all things necessary for the proper completion of the works.

Please refer clauses 5, 6 and 40 of Special Conditions of Contract.

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

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

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

The contractor shall provide everything necessary for the proper execution of works according to the true intent and meaning of the drawings, specifications and the Schedule of Quantities etc., taken together, whether the same may or may not be



particularly shown or described there in, provided the same can be inferred there from. The several documents forming the contract are to be taken as mutually explanatory to one another; detailed drawings and figured dimensions in preference to scale, and special conditions in preference to General conditions and particular specifications in preference to General specifications.

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

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

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

Any error in description, quantity or rate in schedule of quantities or any omission therefrom shall not vitiate the contract or release the contractor from the execution of the whole or any part of the works expressed therein according to drawings and specifications or from any of his obligations under the contract.

The contractor shall make his own arrangements for providing water, for carrying out the work, at his own cost. If water from any source other than Municipal main is to be used for construction, the same shall be tested at the contractor's cost, and a report submitted to the Architect for his approval, before such water is used for the works. Temporary Electrical connections shall be obtained by the contractor to facilitate execution and completion of work at their cost and all the charges there of should be borne by them. Alternatively Air India Ltd at its discretion may give power & water supply and recovery at the rate of 1% each for water & power of the Bill Value will be recover for the items consuming water & Electricity.

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

and make good all the matters and things disturbed during the execution of the works to the satisfaction of the Architects.

Please refer clause 7 of Special conditions of contract.

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

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

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

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

Please refer clause 23 of special conditions of contract.

#### 9. **SEIGNIORAGE CHARGES:**

The Seigniorage charges will be recovered from contractor's bill as per the rates prescribed in the contract documents for the materials used on the work only. The Seigniorage charges to be deducted at source at the rates prevailing from time to time as per Government of Andhra Pradesh Department of Mines and Geology.

#### **RATES OF SEIGNIORAGE FEE**

| <b>S.NO.<br/>(1)</b> | <b>NAME OF THE<br/>MINERAL<br/>(2)</b>      | <b>RATE OF SEIGNIORAGE FEE (RS)<br/>(3)</b>   |
|----------------------|---|---|
| 1.                   | Building Stone                              | Rs. 50/33 (Rupees fifty/Thirty Three) per CMT/MT  |
| 2.                   | Rough Stone/Boulders                        | Rs. 50/33 (Rupees fifty/Thirty Three) per CMT/MT  |
| 3.                   | Road Metal                                  | Rs. 50/33 (Rupees fifty/Thirty Three five ) per CMT/MT  |
| 4.                   | Limekankar/Lime stone                       | The rate of Royalty as applicable to limestone (other than L.D. Grade) in respect of Major Mineral as per the 2 <sup>nd</sup> Schedule of the Mines and Minerals (D&R) Act, 1957. |
| 5.                   | Lime Shell                                  | Rs. 88/- (Rupees eighty eight) per MT   |
| 6.                   | Mosaic chips                                | Rs. 44/- (Rupees Forty Four) per MT   |
| 7.                   | Muram/Gravel                                | Rs. 22/14 (Rupees Twenty Two / Fourteen) per CMT/MT   |
| 8.                   | Ordinary sand useful for civil construction | Rs. 40/- (Rupees Forty) per CMT   |

|     |   |   |
|-----|---|---|
| 9.  | Shingle   | Rs. 17/- (Rupees Seventeen) per CMT   |
| 10. | Chalcedony pebbles  | Rs. 33/- (Rupees Thirty Three) per MT   |
| 11. | Fullers Earth/Bentonite   | Rs. 110/- (Rupees One hundred and Ten) per MT-  |
| 12. | Shale/Slate   | Rs. 110/- (Rupees hundred and Ten) per MT   |
| 13. | Rehmatti  | Rs. 17/- (Rupees Seventeen) per CMT   |
| 14. | Limestone slabs<br>(i) Colour<br><br>(ii) White<br><br>(iii) Black                              | Rs. 7/- (Rupees Seven) Per Sq.Mt or Rs.88/- (Rupees Eighty Eight per MT, whichever is higher.<br><br>Rs. 5/- (Rupees five) Per Sq.Mt or Rs. 55/- (Rupees fifty five) per MT, whichever is higher<br><br>Rs. 4/- (Rupees Four) per Sq.mt or Rs. 44/- (Rupees forty four) per MT whichever is higher. |
| 15. | Ordinary clay silt and brick earth used in the manufacture of bricks including Mangalore tiles. | Rs.3850/- (Rupees three thousand eight hundred and fifty only) per kiln per annum for bricks and Tiles.   |

**(Rate per Cubic metre)**

| 16 | Granite useful for Cutting & Polishing   | Mini Gang saw above 270 Cm x 150 cm & less than 300 cm x 180 cm | Below 270 cm x 150 cm size  | Below 75 Cm size                                     |
|----|--|---|---|--|
| A  | Black Granite Galaxy Variety   | Rs. 2625/- (Rupees Two thousand six hundred twenty five only)   | Rs. 2475/- (Rupees two thousand four hundred and seventy five only) | Rs. 1100/- (Rupees one thousand one hundred only)    |
| b. | Black Granite other than Galaxy Variety  | Rs.2000/- (Rupees two thousand only)                            | Rs.1925/- (Rupees one thousand nine hundred and twenty five only)   | Rs.825/- (Rupees eight hundred and twenty five only) |
| c. | Colour Granite of Srikakulam Blue, Indian Aurora of Nizamabad District, Leptinites of coastal Districts, Black Pearl of Prakasam & Guntur District | Rs.2000/- (Rupees two thousand only)                            | Rs.1925/- (Rupees one thousand nine hundred and Twenty five only)   | Rs.825/- (Rupees Eight hundred Twenty five only)     |
| d. | Colour Granite of Other Varieties  | Rs.1625/- (Rupees one thousand six hundred twenty five )        | Rs.1650/- (Rupees one thousand six hundred fifty only)              | Rs.825/- (Rupees Eight hundred twenty five only)     |

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

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

10. a. In case of non-availability of specified Make/brand of any material including steel and cement the alternate make/brand will be given by the Employer/Architect.

11. **THE SETTING OUT:**

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

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

All soil, filth or other matter of an offensive nature, taken out of any trench, sewer, drain, cesspool or other place shall not be deposited on the surface, but shall at once be carried out away by the contractor to some pits or place provided by them and shall be disposed off as per the rules and regulations of the Local authorities concerned.

13. **OPENING UP WORKS:**

The contractor shall notify the Architect in writing immediately, the trenches or excavation as shown on the drawings are get ready or as soon as any ground is cut

into which, from unexpected causes, appears need for immediate attention. After notifying the Architect, he shall await instructions, which shall be given within ten days of receipt of such notice. If the contractor put in any parts of the foundations before he has so notified the Architect and received instructions, he shall be liable to reinstate all such work that may be subsequently, at any time, damaged on account of any defect or insufficiency of the foundations. The Contractor shall at the request of the Architect, within such time as the Architect so desires, open for inspection any work, and should the contractor refuse or neglect, to comply with such request, the employer, through the

Architect may employ other workmen to open up the same. If the said work has been covered up in contravention of the Architect's instructions, or if, on being opened up, it be found in accordance with the drawings and specifications, or the instructions of the Architect or otherwise, the expenses of such other workmen shall be borne by and recoverable from the contractor, or may be deducted from any money due or which may become due to the contractor. If the work has not been covered up in contravention of such instruction, and be found in accordance with the said drawings and specifications and instructions, then the expenses aforesaid shall be borne by the Employer and be added to the contract sum, provided always that in the case of foundations or of any other urgent work so opened up and requiring immediate attention, the Architect shall within seven days after receipt of the written notice from the contractor that the work has been opened, make or cause the inspection thereof to be made, and at the expiration of such time, if such inspection shall not have been made, the contractor may cover the same and shall not be required to open it up again, except at the expenses of Employer.

Refer clause 7 & 25 of special conditions of contract.

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

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

The Contractor shall maintain and be represented at site at all times, while the work is in progress, by a responsible and efficient foreman, approved by the Architect and who must thoroughly understand all the trades entailed and be constantly in attendance while the men are at work. Any directions, explanations, instructions or notices give by the Architect & Employer to such foreman shall be deemed to have been given to the contractor and shall be binding as such on the contractor. The Foreman shall be thoroughly conversant with the English language and should be able to read, write and speak English. **Since the work is required to be carried in restricted area, the contractor shall obtain the necessary entry permits from Security Department, on furnishing copy of Passport/Police Verification Certificate for all his workman and materials**

15. **DISMISSAL OF WORKMEN:**

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

16. **ACCESS TO WORKS:**

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

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

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

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

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

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

The works included in the contract shall be executed by the contractor and the contractor shall not directly or indirectly transfer, assign or underlet the contract or any part/share thereof or interest therein without the written consent of the Architect and Employer, and no undertaking shall relieve the contractor from the full and entire responsibility of the contract or from active superintendence of the works during their progress.

19. **SUB-CONTRACTORS:**

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

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

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

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

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

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

21. **MEASUREMENTS OF WORKS:**

The Architect/PMC may from time to time intimate the Contractor that he requires the works to be measured and the contractor shall forthwith attend or send a qualified agent to assist PMC/Architect's representative in taking measurements and calculations, and to furnish all particulars or give all assistance required by either of them.

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

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

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

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

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

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

- a. The net rates or prices in the original tender shall determine the valuation of the extra (additional quantities and or extra/substituted item of work), where that work is of a similar character and executed under similar conditions of the work priced therein. This applied to extra and substituted items of work to the extent they are similar in nature to the items in the contract.
- b. The net prices given in the original tender shall determine the value of the items omitted, provided if omissions vary the conditions under which any remaining items of work are carried out, the prices for the same shall be valued under thereof.



- c. Where extra/substituted item of works are not of similar character (either partly & fully) and/or executed under similar conditions as aforesaid or where the omissions vary the conditions under which any remaining items of works are carried out or if the amount of any omission or additions relative to the amount of the whole of the contract works or to be any part thereof shall be such that in the opinion of the Architects the net rate or price contained in the priced schedule of quantities or tender or for any item of the work involves less or more beyond that reasonably contemplated by the Contractor or is by reason of such omission or addition rendered unreasonable for in-applicable, the Architect shall fix in consultation with the Employer such other rates or prices as in the circumstances he shall think reasonable and proper, which shall be final and binding on the contractor. For extra and substituted items this will apply for portions of the items for which, items of similar nature are not available in the contract.
- d. Where extra and or substituted items of work cannot be properly measured or valued, the contractor shall be allowed based on the net local day work rates and wages for the district and prevalent market rates for materials etc., at the time of ordering that item; provided that in either case vouchers for wages paid specifying the daily time (and if required by the Architect, the workmen's name) and materials employed at or before the end of the week following that in which the work has been executed.

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

See Special Conditions of Contract Clause 45.

23. **UNFIXED MATERIALS:**

When any materials intended for the works shall have been placed at site by the contractor, such materials shall not be removed therefrom (except for the purposes of being used on the works) without the written authority of the Architect and Employer and when the contractor shall have received payment in respect of any

certificate in which the architect shall have stated that he has taken into account the value of such unfixed materials on the works such materials shall become the property of the Employer and the Contractor shall be liable for any loss or damage to any such materials.

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

The Architect shall, during the progress of the works, have power to order in writing from time to time the removal from the works, within such reasonable times as may be specified in the order, of any materials which in the opinion of the Architect and Employer are not in accordance with the specifications or the instructions of the Architect and Employer; and the substitution with proper materials and the removal and proper re-execution of any work, which has be executed with materials or workmanship, not in accordance with the contract/drawings and specifications or

instructions etc., the contractor shall forthwith carry out such orders at his own cost. In case of default on the part of the contractor to carry out such orders, the Employer shall have the power to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental thereto shall be borne by the Contractor, and shall be recoverable from the contractor by the Employer, or may be deducted by the Architect, from any money due or may become due to the contractor for this work or on any other account.

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

25. **DEFECTS AFTER COMPLETION:**

Any defect, shrinkage, settlement or other faults which may appear with in the “Defects Liability Period” stated in the Appendix on Page 10 i.e. within 12 months after the virtual completion of the works arising in the opinion of the Architect and the Air India , from materials or workmanship not in accordance with the contract, shall upon the directions and writing of the Architect and Employer and within such reasonable time as shall be specified therein, be rectified and made good by the Contractor at his own cost. In case of default, the Employer may employ any other person to amend and make good such defects, shrinkage, settlements or other faults. All damages, loss and expenses consequent therein or incidental thereto shall be made good and borne by the contractor and such damage, loss and expenses shall be recoverable from him by the employer or may be deducted by the Employer, the damages, loss and expenses from any sums that may be due to the contractor or amount retained under condition 38 (Certificate and payment) and in event of the amount retained being insufficient recover the balance from the amount held against EMD & Security deposit under clause 11.1 & 11.2 on Page 4 or any other amounts due or may become due later.

26. **CERTIFICATE OF VIRTUAL COMPLETION:**

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

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

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

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

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

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

The contractor shall indemnify the Employer against all claims which may be made against the Employer, by any member of the Public or other party, in respect of anything which may arise in respect of the works or in consequence thereof and shall at his own cost, effect and maintain until one month after the works are taken over by the Employer or three months after the date of completion of the contract with an approved office, a policy of Insurance in the joint names of the Employer and the contractor against such risks and signing of the contract. The contractor shall also indemnify the employer against all claims which may be made upon the Employer whether under the Workmen's compensation act or any other statute in force during the currency of this contract or at common law in respect of any employees of the contractor or of any sub-contractor and shall at his own expense

effect and maintain until one month beyond the virtual completion of the contract, with an approved office. A policy of Insurance in the joint names of the Employer and the Contractor against such risks and deposit such policy or policies with the Architects from time to time, during the currency of the contract. In default of the contractor insuring as provided above, the Architect on behalf of the Employer may so insure and may deduct the premiums paid from any money due or which may become due to the contractor.

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

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

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

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

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

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

Please refer Special Conditions of Contract, clauses.

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

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

The minimum insurance cover for physical property, injury, and death is Rs.5.00 lakhs per occurrence with the number of occurrences limited to four. After each occurrence

contractor will pay additional premium necessary to make insurance valid for four occurrences always.

31. **COMMENCEMENT AND COMPLETION:**

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

Refer clause 9 & 37 of Special Conditions of Contract.

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

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

- a. by force majeure, or
- b. by reason of any exceptionally inclement weather, or
- c. by reason of proceedings taken on threatened by or dispute with adjoining or neighbouring owners or public authorities arising otherwise, than through the contractor’s own default, or
- d. by the works or delays of the contractors or tradesmen engaged or nominated by the Employer or Architect and not referred to in the Schedule of Quantities and/or specifications, or
- e. by reason of civil, commotion, local combination of workmen or strike or lock-out affecting any of the buildings/traders, or
- f. by reason of the Architect’s instructions as per clause 2, or
- g. In consequence of the contractor not having in due time, necessary instructions from the Architect, for which he shall have specifically applied in writing ahead of time, giving reasonable time to prepare such instructions.

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

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

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

If the contractor fails to complete the works by the date stated in clause 31 (date of completion) or within any extended time certified under clause 32 (extension of time) and if the Architect shall certify in writing on or before the date of issue of the certificate for the last payment to which the contractor may become entitled hereunder that the works could have been reasonably completed by the said date or within the said extended time, then the contractor shall pay to the Employer or allow

the employer to recover from dues to the contractor on any account the sum stated in clause 17 of "Notice to contractors" (Page 6) (liquidated damages and not by way of penalty), subject to a maximum amount of 10% as stated in Appendix of General Conditions of contract (page 10) and as stated in clause 17 of "Notice to contractors"(Page 6) and such damages may be deducted from any money due or which may become due to the contractor.

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

Please refer clauses 9 & 37 of special conditions of contract.

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

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

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

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

36. **SUSPENSION OF WORKS:**

If the contractor, except on account of any legal restraint upon the employer preventing the continuance of the works, or on account of any of the causes mentioned in the clause "Extension of time" or in the case of certificate being withheld or not paid when due, shall suspend works or in the opinion of the Architects, shall neglect or fail to proceed with due diligence in the performance of his part of the contract or if he shall more than once make default in the respects mentioned in clause 24 (removal of

improper work and materials), the Employer through the Architect shall have the power to give notice in writing to the contractor required that the works be provided within a reasonable manner, and with reasonable despatch, such notice shall not be unreasonably given and must signify that it purports to be a notice under the provisions of this clause and must specify the acts or defaults on the part of the contractor upon which it is based. After such notice shall have been given, the contractor shall not be at liberty to remove from the site of works, or from any ground contiguous thereto, the site of works, or from any ground contiguous thereto, any plant or materials belonging to him which shall have been placed thereon for the purpose of work, and the Employer shall have lien upon such plants and materials to subsist from date of such notice being given until the notice shall have been complied with, provided always that such lien shall not under any circumstances subsist after the expiration of 30 (thirty) day from the date of such notice given, unless the employer shall have entered upon and taken possession of the works and site, as hereinafter provided.

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

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

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

Should the amount so certified as the expenses properly incurred be less than amount which should have been due to the contractor upon the completion of the works by him, the difference shall be paid to the contractor by the Employer, should the amount of the former exceed the later, the difference shall be paid by the

contractor to the Employer. The Employer shall not be liable to make any further payments or compensations to the contractor for or on accounts of the proper use of the plant for the completion of the works under the provisions herein before mentioned other than such payments as is included in the contract.

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

If such plant and materials are not removed within a period of 14 days after the notice shall have been given, the Employer may remove and sell the same, holding the proceeds less the cost of the removal and sale, to the credit of the contractor.

The Employer shall not be responsible for any loss sustained by the Contractor from the sale of the plant in the event of the Contractor not removing it after notice.

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

- a. Where "Prime Cost" (P.C.) prices or provisional sums of money are considered for any goods or works in the specifications or Schedule of quantities or deviations hereof, the same are exclusive of any trade discounts, or allowances, discount for cash, or profit which the contractor may require and or carriage and fixing.
- b. All goods or work, for which prime cost prices or provisional sums of money are considered may be selected or ordered from any manufacturer's or firms, at the discretion of the Architect or the Employer. The Employer reserves to himself the right of paying directly for any such goods or work and the Architect may deduct the said prices or sums from the amount of the contract. Should any goods or works for which prime cost prices or provisional sums are considered or portions of same be not required, such prices or sums, together with the profits allowed for such additional amount as the Contractor may have allowed for carriage and fixing will be deducted in full from the amount of the Contract. Whether the goods be ordered by the Contractor or otherwise, the contractor shall at his own cost fix the same, if called upon to do so, and the contractor shall also receive and sign for such goods and be responsible for their safe custody as and from the date of their delivery upon the works.
- c. In cases in which provisional quantities of items/materials are contained in the contract, the contractor shall provide such materials and or execute such items to such amounts or to greater or lesser amounts as the Architect shall direct in his schedule of quantities.
- d. No prime cost sum or sums (or any portion thereof) shall be included in any certificate for payment to the contractor until the receipted accounts relating to them have been produced by the contractor to the Architect. Such accounts shall show all discounts and any sum or sums in respect of such discounts shall be treated as a trade discount. Provided always, that should the contractor in lieu of producing such receipted accounts, request the Architect in writing to issue a certificate to the Employer for such sum or sums, due either on account or in settlement to a sub-contractor direct, the Architect shall, upon satisfying himself that the sub-contractor

is entitled to the same, so issue the certificate and such sum or sums be deducted from the amount of the contractor, at the settlement of accounts and any profit or sum to which the contractor is properly entitled, in respect of such sub-contract, and which is in conformity with the terms of contract as though the amount of such certificates to the sub-contractor has been included in a certificate drawn in favour of the contractor.

- e. If the contractor neither produces the receipt nor gives authority to the Architect to issue a certificate in favour of such sub-contractor direct, the Architect may upon giving the contractor SEVEN DAYS NOTICE in writing of his intentions to do so, issue to the



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

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

38. **CERTIFICATES AND PAYMENTS:**

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

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

The Contractor shall be entitled to the payment of the final balance (balance security deposit/retention money) in accordance with the final certificate to be issued in writing by the Architect at the expiration of the period referred to as 'The Defects Liquidation Liability period' in appendix on page 10 hereto, from the date of virtual completion or as soon after the expiration of such period as the work shall have been

finally completed and all defects made good according to the true intent and meaning hereof, whichever shall happen, provided always that the issue by the Architect of any Certificate during the progress of the works or after the completion shall not relieve the contractor from his liabilities in cases of fraud, dishonesty or fraudulent concealment relating to the works or materials or any matter dealt within the certificate, and in case of all such defects and insufficiencies in the works or materials, which reasonable examination would have disclosed. No certificate of the Architect shall by itself be conclusive evidence that any works or materials to which it relates are in accordance with the contract.

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

Please refer clause 38 & 45 of Special conditions of agreement.

39. **NOTICES:**

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

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

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

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

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

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

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

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

a. has abandoned the contract or

- b. has failed to commence the works, or has without any lawful excuse under these conditions suspended the progress of the works for 14 days, after receiving from the Architect written notice to proceed, or
- c. has failed to proceed with the works with such due diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon, or
- d. has failed to remove materials from the site or to pull down and replace work for 7 days after receiving from the Architect written notice that the said materials or work were condemned and rejected by the Architect under these conditions, or
- e. has neglected persistently to observe and perform all or any of the acts, matters or things by this contract to the observed and performed by the Contractors for 7 days after written notice shall have been given to the contractor requiring the contractor to observe or perform the same, or
- f. has to the detriment of good workmanship or in defiance of the Architect's instructions to the contrary, sublet any part of the contract.

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

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

The Architect shall thereafter ascertain and certify in writing under his hand when (if anything) what shall be due to or payable by the Employer for the value of the said plant and materials so taken possession of by the Employer, and the expense or loss, which the Employer shall have incurred due to the contractor, and the amount which shall be so certified shall thereupon be paid by the Employer to the contractor or by the contractor to the Employer, as the case may be.

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

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

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

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

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

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

43. **ARBITRATION:**

- a. Parties agree that the avoidance or early resolution of disputes is crucial for a smooth execution of this Contract and success of the assignment. The parties shall use their best efforts to settle amicably all disputes arising tin connection with this Agreement or its interpretation.

- b. All disputes, differences, claim, question or controversy between the Parties arising out of or in relation to this Contract, or the material breach, termination or invalidity thereof, or as to the scope, effect, interpretation, validity or existence of any clause or terms thereof, or in any way relating to or in connection with the work, whether during the progress of work or after its completion (“Dispute”) which can not be settled amicably within 120 days after receipt by one party of the other party’s request for such amicable settlement may be submitted by either party for settlement through arbitration to be conducted in accordance with the procedure of the Arbitration and Conciliation Act, 1996 of India as amended from to time, through a sole Arbitrator to be nominated by the Chairman & Managing Director of Air India Ltd., It is expressly clarified that any person or persons so appointed by the chairman & Managing Director of Air India Ltd, may, have been associated with or worked upon the Project and that this shall not be a ground for disqualification of such person as arbitrator. The arbitration proceedings shall be conducted in English at Hyderabad only. The arbitration award of the Sole Arbitrator will be final, conclusive and binding upon both parties. The cost of arbitration proceedings shall be borne equally by both the Parties. Further the existence of any disputes or pendency of any arbitration or other proceedings will not entitle or enable Contractor to abandon or delay the work or in any manner withhold the services to be performed here under.

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### **SPECIAL CONDITIONS OF CONTRACT**

1. **INSPECTION OF DRAWINGS:**

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

2. **CONTRACTOR TO VISIT SITE:**

**EMPLOYER**

**CONTRACTOR**



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

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

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

- i) The whole of the work as described in the Contract (including the Schedule of Quantities, the specifications and all drawings pertaining thereto) and as advised by the Architect & employer from time to time is to be carried out and completed in all its parts to the entire satisfaction of the Architect & Employer. Any minor details of construction, which may not have been definitely referred to in this contract, but which are usual in sound building, road and all construction practice and essential to the work, are deemed to be included in this contract. Rates quoted in the Schedule shall be inclusive of all freights, taxes, such as octroi, Sales tax, Royalties, duties, excise, turnover tax, sales tax on works contract, etc., as well as transportation, so as to execute the contract as per the rules and regulations of Local Bodies, State Government and Government of India. Any increase in these taxes and rates, during pendency of contract, shall be borne by the contractor and no extra claim on this account will be entertained.

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

- a)
  1. Carrying
  2. Hauling
  3. Labour
  4. Fixing
  5. Watering
  6. Cleaning
  7. Making good
  8. Centering, Shuttering & Scaffolding and
  9. Maintenance etc.
- b) The contractor should arrange timely at his cost for all required.
- i) Plant, machinery, scaffolding, formwork, ladders, ropes, nails, spikes, shuttering, temporary supports, platforms, tools, all materials etc., required for executing the work, and protecting them from weather and other normal/natural causes.

- ii) Covering/protecting for the walling and other works, during inclement weather, strikes etc., as and when necessary and or as directed.
  - iii) All temporary canvas covers/covering, lights, tarpaulin, barricades, water shoots etc.
  - iv) All stairs and steps, thresholds and any other requisite protection for the works.
  - v) All required temporary weather-proof sheds at such places and in a manner approved by the Architect, for the storage and protection of materials, against the effects of sun and rain.
  - vi) All required temporary fences, lighting/sign-boards etc., guards, approaches and roads as may be necessary for execution of the contract works and for safeguarding the public.
  - vii) The whole of necessary plant and machinery like bull dozers, graders, road rollers, bitumen heating plants, blowers, pumps, concrete mixers, hoists, vibrators, scaffolding, formwork, tackle, cartage, labour etc., and removal of the same at the completion of works.
  - viii) Dewatering by bailing out or pumping out the water from foundation/trenches during the progress of work anywhere on site, to the satisfaction of the Architect & Employer: and clearing of the site.
- c) The Architect & Employer will be the sole judge in deciding as to the suitability or otherwise of the tools/formwork/machinery or plant that may be brought to the work site by the contractor for the proper execution of the work.
  - d) The rates quoted by the tenderer in the Schedule of Probable items of work will be deemed to be for the finished work.

4. **R.C.C.WORKS:**

The contractor shall carry out all the RCC works, including formwork, strictly in accordance with drawings, details, relevant BIS specifications, and instructions of the Architects/Employer/Consulting Engineer. If any changes have to be made in the RCC designs, the contractors shall carry out the same without any extra charge. The Architect & Employer's decision in such cases shall be final and shall not be open to arbitration.

5. **SCHEDULE OF QUANTITIES:**

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

Please refer clause 4 of General Conditions of Contract.

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

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

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

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

b. **FILLING OF TENDERS:**

The rates and amounts for each tendered item should filled in separate columns provided for in the Schedule of quantities and all the amounts should be totaled up in order to show the aggregate value of the entire tender. All rates shall be filled in both words and figures. These figures and words shall be preceded by 'Rs' and 'Ps' as the case may be, and while filling in words, must end with "Only". Example:

- i)
- ii)

The rates quoted in figures should be clearly show the rates in full. While filling rates in words, each line should end in '- ', and if continued further, last line for the rate of each item shall end in "Only". All corrections, by the contractor in the tender schedule shall be duly attested by the initials of the tenderer. Corrections which are not attested or overwritings in rates may entail the rejection of the tender.

In case the rates written in figures/words/amount differ, the following procedure shall be followed:

- a) When there is a difference between the rates in figures and in words, the rates which correspond to the amounts worked out by the contractor will be taken as correct.

- b) When the amount of an item is not worked out by the contractor or it does not correspond with the rate written either in figures or in words, then the rate quoted by the contractors in words shall be taken as correct.
- c) When the rates quoted by the contractor in figures and in word tallies but the amount is not worked out correctly, the rate quoted by the contractor shall be taken as correct and not the amount.

7. **ACCESS OF INSPECTION:**

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

Refer clause 7 of General Conditions of Contract.

8. **DIMENSIONS:**

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

9. **PROGRAMME OF WORKS:**

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

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

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

Please refer clause 31 & 33 of General Conditions of contract.

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

- a. The contractor shall erect and maintain entirely at his own expense properly lighted, ventilated waterproof and lockable aircooled offices for the Architect's/ Employers representatives and for his own staff respectively on such parts as the Architects shall indicate. Separate offices for Architects and Employers representatives shall be constructed having minimum area of 20 Sqm, as per the sketch plan and specifications, which will be given by the Architects before starting the work. Contractor shall also provide and maintain, at his own cost, adequate water supply, closets and sanitary accommodation for exclusive use of Architect & Employer's representatives at site. In case, these offices have been provided with AC/GI sheet roofing, the same shall have false ceiling as directed. These offices shall be provided by the contractor with adequate numbers of windows, tables, chairs, steel cupboards, fans, lights and attendants etc., as directed by the architects. Necessary permission from various authorities will be obtained by the contractor and necessary fees shall be paid by the contractor prior to constructing such offices, and as well for stores, huts for labourers or any other temporary structures required for the due execution of work. Any penalty levied by local authorities, for not following their bye-laws/regulations etc., in the matter, will be borne by the contractor. The contractor shall pay for the Electricity and Water charges consumed. All these offices shall be demolished and the materials shall be taken away from site and ground left in good and proper order on completion of work, as required and directed.
- b. The contractor shall provide for all necessary storage on the site, in a specified area for all materials, in such a manner that all such materials, tools etc., shall be duly protected from damages by weather or any other cause. Stores for storage of cement shall have all weather proof floors, walls and roof and have proper locking arrangements and must be secure. All these must be maintained till the work is completed and so certified by the Architect. Necessary and adequate watch and ward for all such accommodations and stores shall be provided for by the contractor at his cost and same included in the rates/amounts quoted by him. All such stores shall be cleared away and the ground left in good and proper order on completion of this contract unless otherwise expressly mentioned herein.
- c. All materials which are stored on the site such as cement, brick, metal sand etc., shall be stacked in such a manner as to facilitate rapid and easy checking of quantities of such materials and prevent deterioration in quality due to water etc.
- d. In addition to the offices provided to Architect's Employer's representative, contractor shall provide accommodation for Project Management Consultants as specified.

11. **WATER AND ELECTRICITY:**

Contractor shall make his own and adequate arrangements for water required for drinking and construction purposes and also for required electric supply at site for satisfactory execution and completion of the work, at his own cost. If water and Electricity is used from Air india Limited source a recovery at one percent will be made from contractors bills against items consuming water and Electricity. The contractor shall get the water used for construction purpose tested periodically as per relevant BIS codes at his cost, and shall get the same approved from Architect and clients before using such water for the work.

12. **PROCUREMENT OF MATERIALS:**

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

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

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

In case sufficient quantities of approved quality materials from approved sources are not available in time, contractor may have to procure the same from neighbouring areas even with longer leads, as required and directed, at no extra cost. In case approved good quality sand is not available consistently throughout the duration of the contract period, best quality of sand locally available may have to be screened and washed, as directed by the Architect and Employer depending upon the use of sand in different items of work, at no extra cost. The materials will be, however as per relevant I.S.S. as and wherever applicable.

Please refer clause 8 & 9 of General Conditions of contract.

13. **SANITARY ACCOMMODATION IN SITE:**

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

14. **FACILITIES TO OTHER CONTRACTORS:**

The contractor shall give full facilities and co-operation to all other contractors working at site doing plumbing, Electrical, civil works etc., as directed by the Architect & Employer and shall arrange his programme of work, so as not to hinder the progress of other works. The decision of the Architect & Employer, on any point of disputes between the various contractors, shall be final and binding on all parties concerned.

15. **TESTING:**

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

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

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

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

16. **TESTING OF CONCRETE:**

The contractor shall make his own arrangements for testing of the concrete blocks at site or in any approved laboratory from time to time, as required by the Architects/ Employer and all the costs of testing and conveyance shall be borne by the Contractor. At least, six blocks of 150 x 150 x 150mm per 20 cum of RCC work or part thereof, for each day's work (subject to the condition that a minimum quantity

of 0.5 cum of particular grade/type of concrete is laid on that day) must be taken in steel moulds as directed and tested. The Architect & Employer reserves the right to test the blocks at the cost of the contractor, in the event of the contractor failing to do so. It shall be contractor's sole responsibility to ensure that the blocks are cast, got tested from specifically approved laboratory/test house etc., in time and results reach the Architect, well before measurements for the corresponding work are to be recorded. For any failure in this regard, shall result in rejection of corresponding work(for which the blocks were not cast and or tested in time) and such work shall be dismantled fully alongwith linked up works and redone to required specifications/quality etc., EXCLUSIVELY at contractor's cost. Without any addition time beyond the

stipulated/extended time for completion, as the case may be. Application of clauses 15 above in such cases shall EXCLUSIVELY rest within the discretion of the Architect.

17. **SITE MEETINGS:**

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

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

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

19. **CEMENT:**

Cement shall be procured by the Contractor from the manufacturers only; however in case of urgency smaller quantity of cement say less than one lorry can be purchased from authorised dealers after getting the make and quality approved by the Employer and Architect. The brands shall be L&T / RAASI / KCP / ACC / Coramandal. The contractor should purchase the cement in adequate quantity, quite in advance, in order to have sufficient stocks (not less than the requirement of next fortnight) at site all the time. He will construct cement storage shed of adequate capacity with water tight walls, floor, roof and secure locking arrangements and locking as required and directed. Empty bags will be contractor's property. Contractor's Site Engineer shall maintain cement account at site, showing cement received with details of invoices, etc., quantity used daily (with brief details of items/location of works on which used), and progressive consumption and balance at site. This register will be checked periodically by Architect & Employer representative. Actual cement consumption will be periodically checked with the theoretical cement consumption. 75% secured advance will be paid to the contractor in his corresponding interim bills, for the cement laying unused at site and in good condition. Damaged cement will not be allowed to be used in work. Transportation of cement, within the site, will be carried out by the contractor, as and when required, at not extra cost. The secured advance paid in any bill will be fully recovered in the next bill.

20. **STEEL:**

Steel shall be procured by the contractor from SAIL/TISCO/VSP or any other manufacturer as approved by Architect. The contractor shall produce necessary cash vouchers in support of the purchases and also test certificates, for conforming the quality. All wastages, rolling margins, site to site transportation shall be borne by the contractor. Contractor shall maintain at site, steel account showing – steel received at site (consignment wise and section wise) and steel used (section wise) for work



corresponding to each of the bills, etc., which shall be subject to checking by client/Architect 75% of the value of the steel physically available at site in good

condition and quantities limited to actual requirements of next 30 days (reckoned from date of corresponding bill) plus 1% for wastage and variation will be paid. This exercise is to be section-wise. Theoretical quantity of consumption of steel shall be actual quantities measured plus 10% towards wastages and variations (rolling margins) and on this basis, balance quantities at site may be provisionally arrived at. All scrap steel at site and unused steel at site to the extent not required on the work shall be contractor's property and contractor will be allowed to take it away after measurements/weight, and after getting necessary permission in writing from the Architect & Employer. In case of any discrepancy between the actual quantity of steel lying at site and the balance quantity as per record, the decision of the Architect/client shall be final and binding. The secured advance paid in any bill will be fully recovered in the next bill.

21. **NO PRICE VARIATION ADJUSTMENT (PVA) IS PAYABLE DURING THE EXECUTION OF PROJCT**

22. **TREASURE TROVE:**

Should any treasure, fossils, minerals, or works or art of antiquation interest be found during excavation or while carrying out the works, the same shall be the property of the Employer. The Contractor shall give immediate notice to the Architect & Employer about finding of any such treasure and hand over the same on demand to the Employer.

23. **NOTICES:**

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

Please refer clause 8 of General Conditions of Contract.

24. **STATUTORY REGULATIONS:**

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

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

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

Refer clause 21 of General Conditions of Contract.

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

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

**WORKS AT NIGHT:**

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

27. **WORKING ON HOLIDAYS:**

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

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

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

29. **REPORTING OF ACCIDENT TO:**

The contractor shall be responsible for the safety of all persons employed by him on the works and shall report serious accidents to any of them, whenever and wherever occurring on the works, to Employer who shall make every arrangement to render all possible assistance. This shall be without prejudice to the responsibility of the Contractor, under the Insurance clause of the General Conditions. Contractor shall take all the precautions as detailed in the safety code attached separately.

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

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

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

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

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

Please refer Appendix to General Conditions of contract.

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

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

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

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

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

Last para of clause 33:

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

- i) Levying a fine of Rs.500 for each default for each month, and or
- ii) Withholding payments, otherwise due.

- iii) For the periods for which name of technically qualified persons are not given or for which such persons are not employed, recoveries shall be made at Rs.7,500/- per month for each month of default.

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

See clause 41 also.

34. **BENCH MARKS:**

The contractor shall construct and maintain proper benches at different places at site as required and directed by the Architect, so that levels can be checked accurately at all times during the progress of work. In case benches are disturbed for any reason whatsoever, necessary rectification shall be carried out by the contractor at his cost as directed by the Architect & Employer.

35. **FORCE MAJEURE :**

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

36. **ARCHITECT'S DRAWINGS AND INSTRUCTIONS:**

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

Refer clause 2 & 3 of General conditions of contract.

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

The work shall be completed in **3 months**, and reckoned as under:

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

or

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

or

- (c) The contractor is asked in writing to take over the possession of the site. Time is the essence of the Contract. The Contractor shall strictly adhere to the programme/chart agreed to. In case the contractor fails to complete the work as

mentioned above, the liquidated damages may be imposed at the rate of 0.5% per each week (or part thereof) of delay, subject to a maximum of 10% of contract amount.

Refer clause 31 & 33 of General Conditions of contract.

38. **BILLS OF PAYMENTS:**

The minimum value of work for interim payments will be Rs.10.00 lakhs, as stated in Appendix on Page 10. The contractor shall submit interim bills, once a month on the basis of joint measurements recorded at site by the contractor's Employer's and the Architects representatives. The bill will be certified by the Architect within 15 working days from the date of submission of the bill by the contractor, and the Employer will make payment as stated in the Appendix to General Conditions of Contract. All such interim payments shall not be considered as an admission of the due performance of the contract or any part thereof in any respect and shall not preclude the requiring of bad unsound and imperfect or unskilled work to be removed and taken away and reconstructed or re-erected at contractor's cost, all as per Employer and Architect's instruction and directions.

39. **WORKMANSHIP:**

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

Refer clause 10 of General Conditions of Contract.

40. **SCHEDULE OF QUANTITIES:**

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

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

41. **SITE SUPERVISION:**

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

See clause 33 above also.

42. **ENGAGEMENT OF APPRENTICES:**

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

43. **RATES:**

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

- (a) When there is difference between the rates in figures and in words, the rates which correspond to the amounts worked out will be taken as correct.
- (b) When the amount of an item is not worked out by the contractor or does not correspond with the rate written either in figures or in words, then the rate quoted in words will be taken as correct.
- (c) When the rate quoted by the contractor in figures and words tallies but the amount is not worked out correctly, the rate quoted will be taken as correct and not the amount.

Rates quoted by the contractor shall hold good for all the work carried out upto any height and depth, as shown in detailed drawings and laid down in bill of quantities and or as required and directed by the Architect.

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

Minor repairs and works to other existing buildings and services shall also be carried out by the contractor at rates quoted in the tender.

The rates quoted for all items of work shall include all the items of work covered by the specifications for the corresponding item of work, unless otherwise specifically mentioned to the contrary (NOT IMPLIED) elsewhere.

- (d) When contractor does not quote the rate in either figures onwards but fills the column “amount” then the rate will be worked out and considered.

44. **INCOME TAX AND WORKS CONTRACT TAX:**

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

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

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

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

See clause 22 of General Conditions of Contract.

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

After getting approval from the Architect & Employer, the contractor shall submit to the concerned local authorities necessary services drawings showing layouts etc., for getting approval of the schemes. On completion, the contractor shall arrange to get Drainage Completion Certificate and other Certificate necessary for obtaining Building Completion certificate. The contractor shall furnish completion drawings of all services in triplicate, showing the work as actual executed, along with levels. Contractor shall submit for approval 4 copies of shop drawings/ catalogue/ equipment characteristics/ manufacturer's specifications, drawings etc., as and when required and directed by the Architect & Employer. Costs of all these are deemed to have been included in the respective item rates quoted by the contractor and nothing extra shall be paid on account of any of these requirement/acts.

47. **PAYMENT:**

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

See clause 36 & 37 of General conditions of contract.

48. **PERMISSION:**

The contractor shall also obtain necessary permission for using explosive (if required and specifically permitted by the Architect and Employer in writing), as per rules and regulations of relevant authorities, and all other approvals from the relevant authorities shall be obtained by the contractor at no extra cost.

49. **MAINTAINING REGISTERS AT SITE:**

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

50. **AGREEMENT:**

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

51. **INSURANCE:**

The contractor shall provide insurance in respect of damage to persons and property and firm insurance as per clause 28 and 29 of General conditions of contract. In addition he will also insure against riots and civil commotion. The insurance shall also cover third party and all the persons working at site and visitors including contractors, worker's, Architect's and clients people, other contractor's workers etc. The contractor shall indemnify the Employer against any claim or compensation or mishaps of whatsoever nature at site during the progress of work.

The contractor shall prove to the Architect/Client from time to time that he has taken out all the insurance policies as required and directed and has paid the necessary premium for keeping the policies valid as per clause 28 & 29 of the General Conditions of Contract.

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

52. **INDEBTEDNESS AND LIENS:**

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



the contractor until such indebtedness is paid, or apply the same towards the discharge thereof.

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

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

54. **PHOTOGRAPHS:**

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

56. **SPECIAL CONDITIONS OF CONTRACT:**

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

57. **BIS CODES**

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

**GENERAL SPECIFICATIONS FOR ELECTRICAL WORKS**

**1.1 I.E. RULE 1956:**

The installation shall generally be carried out in conformity with Indian electricity rule 1956 as amended from time to time and national electrical code which contains specific regulations to be adhered to in the supply and use of electrical energy in the interest of safety.

## **1.2 PRESSURE AND FREQUENCY OF SUPPLY:**

All current consuming devices shall be suitable for the pressure and frequency of supply stated in the special conditions of contract.

## **1.3 SYSTEM OF WIRING:**

The wiring shall be carried out on such a system as may be specified in the conditions of contract. Power wiring shall be kept separate and distinct from lighting wiring. All conductors shall be run as far as possible along the walls and ceiling, so as to be easily accessible for inspection. The balancing of circuits in three phase system shall be arranged before handing over to the department..

## **1.4 CONDUCTORS:**

The material and size of the conductors shall comply with the bureau of the Indian standards and as per the provision of I.E. rules, 1956. all cables shall have the maker's name and identifications printed on the insulated surface. In case of dispute regarding make it is the responsibility of the contractor to prove that the material is original of the company.

## **1.5 MATERIALS:**

All materials, fittings, equipment and their accessories, appliances, etc, used in an electrical insulation shall conform the bureau of India standard specification wherever they exist. Incase the Indian standard does not exist, the materials and other items shall be those approved by the competent authority. A list of approved materials for use in the electrical works is enclosed.

## **1.6 TESTS TO BE COMPLIED WITH:**

Before the installation is permanently put in to service the following test shall be complied with.

### **a) INSULATION RESISTANCE:**

The insulation resistance shall be measured by applying between earth and the whole system of conductors or any section there of with all fuses in place and all switches on a direct current pressure of not less than twice the working pressure shall be deemed to be that which is maintained between the phase conductors and the neutral.

- b) The insulation resistance of an installation measured as in above shall not be less than 1 mega ohm.

Lighting circuits shall be tested with all lamps in place except in the case of earthed concealed wiring system.

Heating and power circuits may be tested, if desired with the heating and power appliances disconnected from the supply.

## **1.7 EARTH RESISTANCE:**

It is recommended that the value of Earth Resistance of any earth system shall be maintained below 0.1 ohm other wise specified. Care should be taken select a material which is resistant to corrosion in the soil in which, it will be used. The electrode shall be kept free from paint, enamel and grease. The size of the earth continuity conductor should not be less than 14 S.W.G.(2.8.94sqm). earth resistively test shall be carried out in accordance with Indian standard code of practice for earthing. IS 3043.

## **1.8 CONDUIT SYSTEM OF WIRING:**

The conduit shall be electrically continuous from distribution board to outlet boxes of lighting switches and other appliances. The lengths of conduits shall be joined by means of screw sockets. Threads shall be free from grease or oil and no material of this nature shall be allowed to come in contact with the conductors.

Rigid non – metallic conduit pipes as per IS 9537 Part – 3 , 1976 are to be used for the wiring Installation and accessories for the pipes are to be in accordance to Indian Standards IS 3419 – 1976.

Also wiring is to be done with Suitable size of casing and capping. The casing and capping is to be rigidly fixed to ceiling/wall with screws and rawl plugs. The scope includes the supply and fixing of hardware required for Installation of casing and capping.

In case at DB Junction point if junction box is required junction box is to be provided and the same is to be fixed at free of cost.

Jointing of conduits should be done with suitable size of couplers and the same are to join with good quality adhesive.

Fixing of Conduit pipe should be done with Base Saddle and clamps at an interval of 60 cm.

## **2. MEDIUM VOLTAGE AND LOW VOLTAGE SWITCH GEAR PANEL**

### **2.1 BOARD:**

The main panel board shall be floor mounted and totally enclosed. The design shall include all provisions for safety of operating and maintenance personal. The general construction shall conform to appropriate Indian standard specifications. Cubical type switch board shall be fabricated out of sheet steel not less than 2.00mm thick. Such

sheet steel member shall be stiffened by angle iron frame work. Unless otherwise approved, incomer bus section panel or sections shall be separate and independent. The general arrangement

for multiplier construction shall be such that the horizontal bar framed present a pleasant and authentic look. The general arrangement shall be got approved before fabrication. All cable entries shall be through gland plates. Cable entry plates shall be sectionalized. The construction shall include necessary cable supports for crimping the cable alloy or rear cable chamber. incomer termination shall be suitable for receiving busbar trunking.

Busbar shall be firmly fixed on support constructed from a suitable insulating material which conforms to relevant Indian standards. The support shall be sufficiently robust to effectively withstand electromechanical stresses produced in the event of short circuit. The minimum clearance to be maintained for open and closed indoor air insulated busbars/electrically iron exposed and working at system voltage up to 600volts shall be as follows:

| BETWEEN        | MAINCLERANCE |
|----------------|--------------|
| Phase to earth | 26mm         |
| Phase to phase | 32mm         |

## 2.2 DISTRIBUTION:

Distribution boards shall be assembled, aligned and installed as per installation manual of the switch board supplier and relevant Indian standard specifications. Phase sequence for each incomer shall be tested and connections adjusted accordingly. A mechanical endurance test shall be carried out by closing and opening of the circuit breaker.

## 2.3 COMPLETION DRAWINGS:

At the completion of the work and before issuance of virtual completion contractor shall submit to the departmental officer five sets of layout drawings drawn at approved scale indicating the complete wiring system "as installed". The drawings shall in particular give the following information.

Run and size of conduits, inspection and junction boxes.

Number and size of conductors in each circuit

Location and rating of sockets and switches controlling the light and power outlets.

Location and details of distribution boards, main switches and others particulars.

A complete wiring diagram as installed and schematic diagram showing all connections in the complete electrical system.

Instructions, maintenance and operation manuals if any for the equipments.

Contractor should obtain necessary approval, from electrical inspectorate submitting necessary drawings test certificates etc.

## 3. SPECIAL CONDITIONS FOR THE ELECTRICAL WORKS (GENERAL)

The work shall be carried out strictly in conformity with (1) code of practice for electrical wiring and fittings in Govt. buildings (2) the Indian standard specification (3) the departmental specification, if the work carried out does not comply with the code of practice and departmental specifications and if the workmanship is unsatisfactory it will be binding

the contractor to redo the job without any extra cost and pay penalty as decided by the department.

The work should be carried out under the direct supervision of persons holding a certificate of competency for the type of work involved.

After completion of work a plan of building should be prepared indicating the location of various main and sub-boards and all the fitting together with a circuit diagram duly

numbered (in the diagram). The final bill will not be paid till the above and the diagram submitted and approved after verification.

The contractor will be responsible for any defects noticed for either improper workmanship or defective materials supplied by him for one calendar year from the date of final completion of work.

Lugs of suitable size should be provided for all earth connections.

The contractor himself should arrange for the transportation of men and material to their work spot.

All civil works and patch works indicated for providing electrical installations should be well finished to the satisfaction of the civil authorities. A certificate from them should be obtained to the effect that the civil and patch work done is to the satisfaction of civil authorities. It will be the responsibility of the electrical contractor to obtain such certificate from the civil engineer. Unless such certificate is produced this office will have right to withhold the bill.

Concreting to the pole and providing independent earthing should be done in presence of departmental staff.

The distribution board with switch controls shall be separate in each floor for normal supply and essential supply.

The lighting circuits shall be provided with separate conductor to enable to connect the normal lighting and essential lighting with linking to any of the above system to ensure to switch over to essential supply in the order to have minimum to avoid inconvenience to the staff working.

The control for the luminary to be provided in the hall for both to be connected to the normal supply and essential supply shall be separate and away from the each system. For the points to be connected to essential supply a separate conduit system is to be laid as enumerated in the above conditions includes circuit a main of any system. The location for the D.B's and switch controls for essential supply will be decided during the course of execution where the circuit conduit way have to be terminated.

List of Number of wires that are to be carried out in rigid non metallic conduit pipes is given below and the work is to be carried out in accordance with the same. The minimum thickness of the conduit pipe must be 1.6 mm and diameter should be 20 mm .

| Size of table                               |                              | SIZE OF CONDUITS, MM  |    |    |    |    |    |    |
|---|------------------------------|-----------------------|----|----|----|----|----|----|
| Normal cross sectional area mm <sup>2</sup> | No, and diameter of wires mm |                       | 20 | 25 | 32 | 40 | 50 | 63 |
|   |                              | Number of Cables, Max |    |    |    |    |    |    |

EMPLOYER

CONTRACTOR

|      |                     |   |   | S | B | S  | B  | S  | B  | S | B | S | B | S | B |
|------|---------------------|---|---|---|---|----|----|----|----|---|---|---|---|---|---|
| 1.0  | 1/1.12*             | - | - | 7 | 5 | 13 | 10 | 20 | 14 | - | - | - | - | - | - |
| 1.5  | 1/1.40              | - | - | 7 | 5 | 12 | 10 | 20 | 14 | - | - | - | - | - | - |
| 2.5  | 1/1.80<br>3/1.06    | - | - | 0 | 5 | 10 | 8  | 18 | 12 | - | - | - | - | - | - |
| 4.0  | 1/2.24<br>7/0.35    | - | - | 4 | 3 | 7  | 8  | 12 | 10 | - | - | - | - | - | - |
| 6.0  | 1/2.80<br>7/1.06*   | - | - | 3 | 2 | 6  | 5  | 10 | 3  | - | - | - | - | - | - |
| 10.0 | 11/3.55+<br>7/1.40* | - | - | - | 5 | 4  | 3  | 7  | -  | - | - | - | - | - | - |
|      |                     | - | - | 2 | - | 4  | 3  | 6  | 5  | 8 | - | - | - | - | - |
| 16.0 | 7/1.70              | - | - | - | - | 2  | -  | 4  | 3  | 7 | 6 | - | - | - | - |
| 25.0 | 7/2.24              | - | - | - | - | -  | -  | 3  | 2  | 5 | 4 | 8 | 6 | 9 | 7 |
| 35.0 | 7/2.50              | - | - | - | - | -  | -  | 2  | -  | 4 | 3 | 7 | 5 | 8 | 6 |
| 50   | 7/3.00 +<br>1-/1.80 | - | - | - | - | -  | -  | -  | -  | 2 | - | 5 | 4 | 6 | 5 |

“\*” for copper conductors only.

“+” for aluminum conductors only.

The Lighting Design scheme is with Astronomical control of Lighting System for the total Process area. The Process area Lighting is With Analogue dimmable ballasts and the scope involves the supply, installation, testing and commission of the total control system with required wiring for automatic control and also with overwight provision for each individual Luminaire in the process area. Also for fixing of all Luminaires the scope includes the supply and erection of fixing chain, fixing brackets etc.

#### LIST OF THE APPROVED METERIALS FOR USE IN ELECTRICAL WORKS:

| Sl.No | Name of material  | Make                     |
|-------|---|--------------------------|
| 1     | P.V.C. pipes and accessories/ Casing and Capping conduits with all accessories. | Makes approved by I.S.I. |

|    |  |  |
|----|--|--|
| 2  | Insulated wires sheeted PVC cable are acceptable, in the case of conduits PVC insulated cables should be used. | Finolex/Polycab/Anchor   |
| 3  | Link clips   | Chromium coated-steel (or) aluminum  |
| 4  | Screws or nails of all sizes   | Bharat, sharp(Brass, M.S)only  |
| 5  | Wooden accessories (including fillets gutties, board and blocks including, double boards)                      | Make of well seasoned high quality wood without knots and well polished. Approval of concerned to be taken before use. |
| 6  | Ceiling roses, junction boxes and E.I.shades   | Anchor and Best Indian make in ISI approved brand.   |
| 7  | Pendent holders and batten holders and brackets.   | Anchor and Best Indian make in ISI approved brand.   |
| 8  | 6A single pole switches two way switches, flush type switch and porcelain fuse                                 | Legrand/Roma   |
| 9  | 6A 3pin socket and 16A, powerplugs flush type sockets kit kat fuse units                                       | Legrand/Anchor/Roma  |
| 10 | Distribution boards of single phase and 3phase from 4way to 12way  | Legrand/Schneider/Havells/ABB  |
| 11 | Iron clad sheet metal main switches of various capacities both rewirable and HRC type.                         | Havell's, standard, sputnik, HPL, and any ISI approved make.   |
| 12 | Rewirable and HRC fuse units of various capacities.  | Havell's, standard, sputnik, HPL, and any ISI approved make.   |
| 13 | M.C.B/M.C.C.B  | Legrand,Siemens,ABB  |
| 14 | PVC/XLPE cables  | Universal, KEI-Industries, Asian,Unistar, Paragon, Premier, Tropodar, Finolex, Polycab, or any ISI approved brands.    |
| 15 | Fluorescent/Led Light Fittings   | Crompton,Phillips, Bajaj and Wipro   |
| 16 | L.T.Panel  | Panel Manufacturers With CPRI Certification  |
| 17 | Cable Tray   | Patny/Fixotech/Profab  |

I hereby agree to use material only from the makes specified against each item.

Note:- The approved makes specified in schedule-A should be used in the work invariable incase of non specified items in schedule-“A” the approved makes as specified in the above list can be used.

#### **4. WIRING INSTALATION**

##### **13.1 SCOPE**

The scope under this section wiring installation comprising of lighting /fan /exhaust fan/ circuits/ bell points.  
Power circuits and air condition circuits.  
Circuit wiring.

##### **13.2 SURFACE CONDUIT WIRING SYSTEM WITH RIGID NON METALLIC CONDUIT/CASING & CAPPING**

###### **a) Type and size of conduit:**

All conduit pipe should be in accordance with Indian Standrad IS 9537 – Part 3 – 1987 and accessories for conduit are to be in accordance with IS 3419 – 1976.

###### **b) Bunching of cables:**

Unless other wise specified, insulated conductors of AC supply shall be bunched in separate conduits. For lighting and small power outlet circuits phase segregation in separate conduits is recommended.

###### **c) Conduit joints:**

Conduits shall be joined by means of coupler accessories only. In long distance straight rooms of conduits inspection type couplers at reasonable intervals shall be provided. Cut ends of conduit pipes shall have no sharp edges nor any burs left to avoid damage to the insulation of conductors while pulling them through such conduits.

Inspection type conduits fittings such has a inspection boxes, draw boxes, bends, elbows and tees shall be so installed that they remain accessible for such purposes as withdrawal of existing cables or installation of additional cables.

All switch board/Power Socket 6A and 16 A boxes shall be Plastic Surface mounting modular box.

For Airconditioning the Box should be M.S.Box with 20 A, SP MCB and 20 A Metal clad Plug and Socket.

Suitable inspection boxes shall be provided to permit periodical inspection and to facilitate removal of wires if necessary. Minimum size of inspection boxes shall be 75x75mm.

The Plastic switch board boxes. Light Fittings etc, should be efficiently earthed with a suitable means of earth attachment . when crossing through expansion joints in buildings, the conduit section across the joint may be through flexible conduits of same size as the rigid conduit.

#### **Wires :**



Wires shall comply with following features.

Annealed copper conductors multi strand, FRLS, PVC insulated, 1100 volts grades cables.

|        |     |   |        |
|--------|-----|---|--------|
| Phase  | -R  | - | Red    |
| Phase  | -Y  | - | Yellow |
| Phase  | -B  | - | Blue   |
| Neutal | -BL | - | Black  |
| Earth  | -GR | - | Green  |

On each lighting / ceiling fan/ Exhaust fan circuit not more than 6 points or 800-1000 watts load should be connected . if on one of the switch boards there are only 4 switches to control 4 lights, other switch board another 3 switches to control lights etc, while arriving at the circuit length the shortest distance from circuit breaker in the MCB distribution board to the nearest switch board shall be considered. Interconnections between such switch boards shall be allowed by providing same wires as are used for light points and no measurement in circuit wiring is allowed for such inter connections. A separate conduit pipe/casing and capping has to be provided for running circuit mains and the conduits for light points never be used.

For 5 Amps 3 pin on separate location the circuit measurement to first nearest 5 Amps 3 pin socket is considered. No measurement will be separately considered for looping of switch boards in circuit wiring.

The mounting height of switch boards (bottom of Plastic Surface boxes ) shall be 4:6” from finished floor level.

The 5Amps/ 15Amps 3pin sockets with shutter protection shall be at skirting level. Wiring for power circuits i.e., 15Amps 3 pin and AC points shall be provided in separate conduit pipe.

Neat holes shall be punched on Plastic Surface switch board boxes for PVC conduit pipe/Casing and capping entries. Rough burred holes with chisel shall be avoided. Conduit pipes to be fixed to Plastic switch board boxes, MCB distribution boards etc, by providing double check nut arrangement before drawing of PVC insulated cable inside the conduits, ebonite / nylon bushes to be provided at conduit ends in order to avoid damage to cables during drawing.

3mm thick hylum covers provided on switch board should be fixed to MS switch boards by providing brass screws and plated cup washers

Any loose holes on Plastic Switch Board boxes and Distribution Boards shall be properly closed, so as to prevent entry of lizards etc.,

Whenever cables of size 2.50 Sq.mm and above are connected inside switch, socket or MCB, metallic plug point etc., proper type and size of lugs to be crimped to cable leads before making the permanent connection in switches etc.

Telephone/ intercom cables shall not be laid in the same conduit where electric lighting/ power cables are drawn. Separate conduit pipes to be used for drawing of telephone/ intercom cables.

Loose joints with PVC insulation shall be avoided. Wherever possible joints of cables shall be avoided, If found necessary proper type and size of connectors shall be used. The drop of voltage between the main switch/dist. Terminals and the farthest current consuming apparatus shall not exceed 2% with all devices switched on.

#### Testing

The entire installation shall be tested for

Insulation resistance

Earth continuity

Earth Resistance

polarity of single pole switches

Tests shall be conducted in the presence of site Engineer.

Test results to be and submitted to the site engineer.

## 5. MCB DISTRIBUTION BOARDS, MCB'S AND MCCB'S

### 5.1. Scope

The scope under this section covers installation comprising of

Low voltage distribution boards

Distribution boards are to be in accordance to Indian Standrads IS 8623

### 5.2. Details

The distribution boards shall have, vermin, dust, rust proof painting done by powder coating process.

The cable entering the D. board should be properly bunched and dressed before making connection in MCB's & MCCB's

Glands to be provided wherever armored cables are connected

Cable leads shall be provided with proper type and size of lugs crimped to leads before making permanent connection inside MCB's, mCCB's etc.

Permanent circuit identification shall be provided on the distribution boards.

The mounting height of MCB distribution boards etc, (bottom line) shall be 6'6" from Finished floor level.

## 6. CABLES

### 6.1 Scope

The scope under this section covers.

Power cables

### 1.2 Standards

- |                   |   |
|-------------------|---|
| a) IS:8130        | :Specification for conductors for insulated electric cable. |
| b) IS:1554-Part I | :Specification for armoured/ unarmored power cables.        |
| c) IS:3961        | :Recommended current ratings for cables.                    |

- d) IS:5831-1984 :Specification for PVC insulation and sheeting of electric cable.  
e)IS7098 – :Specification for XLPE insulated armoured cables

### 6.3 General requirements for cables

Cables should be standard aluminum conductors for 6mm and above.  
L.V. cables shall be 1100 volts grade.  
Cables shall have colour-coded insulation.  
P.V.C inner and outer sheathing shall be applied by extrusion.  
Steel armoring between inner and outer sheathing.  
The PVC insulation and sheathing shall conform to IS:5831-1984.  
The armoring for cables up to 16sqmm shall be of rounded steel wire that above 16sqmm shall be of galvanized steel strings.

### 6.4 Laying of Cables

- a) Cables if laid underground shall be at a depth of not less 600mm; in a trench sand of filling shall be provided at the bottom of trench before laying the cable. Bricks shall be provided on either side of the laid cable. Sand filling shall be done to cover the cable laid. Bricks shall be provided on the top. Earth filling shall be done.

M.S. cable identification tags to be provided at every 8 meter length of cable laid.

Hume pipe, trenches/ tunnels with proper precast slabs to with stands wear and tear of vehicular traffic shall be provided at road crossing.

Cable if laid in the air shall be laid on cable trays and shall be properly clamped to the trays by plated MS. Saddles at proper intervals. Cables shall be properly dressed before fixing on the cable trays.

Extra cable loops of minimum 500mm shall be provided at each end of cable laid.

Cable shall be bent to a radius of 20times the diameter of the cable with a minimum of the diameter at restricted space.

Control/telephone cables shall be laid away from power cables on separate cable trays.

### 6.5 Testing

Manufacturer report shall be submitted for test on cables in accordance with Indian standards specifications.

Cables shall be tested after installation before commissioning by using 1000 volts meggar for 1.1 KV grade cables and with 5000 V , Meggar for 11 KV grade cables and the following readings are to be obtained in tabular form.

Continuity of all conductors  
Insulation resistance  
Between Phases  
Between Phase and Neutral  
Between Phase and Earth

The tests shall be conducted in the presence of site engineer and results are to submitted.

## 7. Cable termination

cable gland body shall be made of brass castings and machined to final size. The general construction of the glands should as per standard manufacturer drawings. It mainly consists

compression nut-brass-1nos

gland body with hexagonal head- brass-1nos

rubber ring-rubber-1nos

brass washers-brass-3nos

check nuts-brass-1nos

metal parts of the gland shall be free from blow holes and surface shall be machined smoothly.

All edges shall be debarred and then nickel plated wherever necessary. The cable glands shall be of single compression type.

## 8 L.T.PANEL BOARDS

### 8.1 Scope

The scope covers the requirement of designs, construction, assembly, testing, supply and installation of panel boards.

### 8.2 STANDARDS

|          |   |  |
|----------|---|--|
| IS: 4064 | - | code of practice for switch of use units   |
| IS: 4237 | - | general requirements for switch gear and control<br>Great for voltages not exceeding 1000volts |
| IS: 2147 | - | degree of protection provided by enclosures for low<br>Voltage switchgear for cables.          |
| IS: 9224 | - | fuse class category  |
| IS: 2705 | - | Current transformers   |
| IS: 1248 | - | indicating instruments   |
| IS: 375  | - | marking and arrangement of bus bars  |
| IS: 3156 | - | Voltage transformers   |
| IS: 3231 | - | relay  |
| IS: 722  | - | Integrating information  |
| IS: 6975 | - | Control switches and push buttons  |
| IS: 2959 | - | Auxiliary contractors  |
| IS: 2516 | - | Air circuit breakers   |
| IS: 2208 | - | HRC fuse links   |
| IS: 8623 | - | Factory built assemblies of switch gear and control gear                                       |

### 8.3 CONSTRUCTION

The panel board shall be

- 1) Of the metal enclosed, indoor, floor mounted, free standing types.

- 2) Be made up of the requisite vertical sections, which, when coupled together shall form continuous dead front switch boards.
- 3) Provide dust and damp protection, the degree of protection being no less than IP,51 to IS 2147
- 4) be readily extensible on both sides by the addition of vertical sections after removal of the end covers.

**8.3** The panel boards shall be 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 services.

Each vertical section shall comprise

- 1.a front framed structure of rolled/ folded sheet steel channel section. Of minimum 2mm thickness, rigidly bolted together. This structure shall house the components contributing on the major weight of the equipment, such as circuit breaker fuse switch units, main horizontal bus bars, vertical risers and other front mounted accessories.

The panel shall be mounted on a rigid base frame of folder sheet steel of minimum 2mm thickness and 100mm height. The design shall be or such that the weight of the components is adequately supported without deformation or loss of alignment during transit or during operation.

2. a cable chamber housing the cable and connections, and power /control cable terminations. 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 contract with live parts in an adjacent section.
3. Front and rear doors fitting with dust excluding neoprene gaskets with fasteners Designed to ensure proper compression of the gas kets, when covers are provided in place of doors. Generous overlap shall be assured between sheet steel surface with closely spaced fasteners to preclude the entry of dust.

the height of the panel should not be more than 2400mm, the total depth of the panel should be adequate to cater for proper cabling space.

Doors and covers shall be minimum 2mm thick sheet steel sheet steel shrouds and partitions shall be of minimum 1.5mm thickness. All sheet steel work forming the exterior of switch boards shall be smoothly finished, leveled and free from flaws. The corners should be rounded.

The apparatus and circuits part of the boards shall be so arranged as to facilitate their operation and maintenance and at the same time to ensure the necessary degree of safety.

Apparatus forming part of the panel boards shall have the following minimum clearance:

- 1) Between phases -25mm
- 2) Between phases and earth -25mm

- 3) Between phase and earth -25mm
- 4) Between natural and earth -19mm

When, for any reasons, the above clearance are not available, suitable insulation shall provided. Clearance shall be maintained during thermal service conditions be creep age distance shall comply to those specified in relevant standards.

All insulating material used in the construction of the equipment shall be of non-hygroscopic material, duly treated with stands the effects of high humidity, high temperature tropical ambient service conditions.

Functional units such as circuit breakers and fuse switches shall be arranged multi tier formation, except that not more than two air circuit breakers shall be in a single vertical section.

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

1. Main bus bars and vertical raisers during operation inspection are maintenance of functional units and front mounted accessories.
2. Cable terminations of one functional units, when working on those of adjacent unit/units.

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

Provision shall be made for permanently earthing the frames and other metal parts of the switch gears two independent connections.

### **Metal treatment and finish**

All steel work used in the construction of the switch boards, should have under one a rigorous metal treatment process as follows: seven tank process:

1. Effective cleaning by hot alkaline degreasing solution followed by cold water rinsing to remove traces of alkaline solution.
2. Pickling in the dilute sulphuric acid to remove oxide scales and rust formation, if any followed by cold water rinsing to remove traces of acidic solution.
3. A recognized phosphate process to facilitate durable coating of the paint on the metal surface and also to prevent the spread of rusting in the event of the paint film being mechanically damaged. This again, shall be followed by hot water rising to remove traces of phosphate solution.
4. Passivating in de-oxalate solution to retain and augment the effects of phosphate.
5. drying with compressed air in a dust free atmosphere.
6. primer coating with a two coats of a highly corrosion resistant primer, applied wet on wet and stove deride under strictly controlled conditions of temperature and time.

7. A finishing coat of stoving synthetic enamel paint to the specified shade of IS 5. the total thickness of paint should not be less than 15 to 20 microns

## **8.5 BUSBARS**

**8.5.1** The busbars shall be air insulated and made of high conductivity. High strength aluminum alloy complying with the requirements of grade E91 of IS 5082.

**8.5.2** The busbars shall be suitably braced with non-hygroscopic SMC supports to provide as through fault with stand capacity of 50 KA RMS symmetrical for one second and a peak short circuit with stand of 105 KA minimum. The natural as well as the earth bar should also be capable of withstanding the above fault level. Ridges shall provided on the SMC support to prevent trickling between adjacent busbars.

**8.5.3** Large clearances and creep age distance shall be provided on the busbars system to minimize the possibility of a fault.

**8.5.4** High ten site bolts and spring washers shall be provided at all busbar joints.

**8.5.5** The cross sections of the busbars risers for various rating shall have been decided on the basis of temperature raise tests carried out under conditions closely similar to actual service conditions. For a total operating temperature of 110 deg C. at an ambient of 40 deg. At the standard current ratings and corresponding cross sections of the busbars should be such that the busbar shall be carry 1 Amp.Sq.mm.

**8.5.6** The main phase busbars shall have continues current rating throughout the length and the natural busbars shall have continues rating of atleast 50% of the phase bus bars.

**8.5.7** Connections from the main busbars to functional circuits shall be arranged and supported so as to with stand without any damage or deformation thermal and dynamic stresses due to short circuits currents.

**8.5.8** Busbars shall be colour coded for easy identification of individual phases and natural.

**8.5.9** The busbars shall be suitably supported with epoxy resin mould insulater.

### **8.5.10 Tests**

The panel board shall be inspected as per relevant standards in presence of the site engineer and shall include

High voltage test

Insulation test

Constructional and safety features

### **8.5.11 Name Plates**

Main name plates shall be fixed at the top center nameplate giving feeder details shall be provided and are to be fixed by screws.

## 9. EARTH ELETRODES

### 9.1 Scope

The scope included both pipe earth electrodes and plate earth electrodes

### 9.2 Standards

IS: 3043 - code of practice for earthing

### 9.3 Construction

Pipe Earth electrode: G.I. pipe shall not be less than 38mm diameter and 2.5 meter long. It shall be burries vertically into the earth pit with the top not less than 1.25 meters below ground level. The G.I. pipe should be 'C' class type.

Plate earth electrode: plate shall be 600x600x3.15mm. copper or 600x600x3.15mm G.I. plate shall burries in the earth with faces vertical and top shall be less than 1.5 meters below ground level.

The electrodes shall be surmounted by alternate layer of charcoal or coke and salt. Watering arrangement with ½" G.I. pipe with a tunnel shall be provided, the later being housed with chamber (masonry) off inner size 300x300mm CI hinged cover with CI frame to be provided on the top.

PCC Chamber of required size as per IS 3043 to be constructed and the chamber is to be provided with 1 ft x 1 ft cast iron cover.

#### Tests

The resistance of earth electrode shall be less than 5.0 ohms.

The Resistane of Earth Electrodes is to be tested and recorded after installation and before commissioning of the system.

## 10 LIST OF INDIAN STANDRDS FOR ELECTRICAL WORKS

- IS: 4237 General requirements for switchgear control gear for voltages not exceeding 1000V
- IS: 2147 Degrees of protection provided by enclosures for low voltage switches and control gear.
- IS: 3202 Code of practice for climate proofing of electrical equipment.
- IS: 8828 Miniature air break circuit breakers for voltage not exceeding 1000V
- IS: 2959 AC conductors' voltage not exceeding 1000V
- IS: 5 Ready mixed paints and Enamels
- IS: 2551 danger notice plates.



- IS: 4064 Normal duty air break switches and composite units of air break switches and fuses for voltages not exceeding.
- IS: 2705 Current transformers
- IS: 2208 HRC cartridge fuse links
- IS: 5082 Wrought aluminum and aluminum alloys, bars, rods, tubes and sections for electrical purposes.
- IS: 8623 Simulator build assemblies of switch gear and control gear for voltage up to and including 1000V AC and 1200V DC.
- IS: 1248 Direct acting electrical indicating instruments.

1. Relevant Indian standards for the various materials to be used in electrical works as per specification condition No.80.05

## 12. CONDUITS & ACCESSORIES AND JUNCTION BOXES

- IS: 9537 part 3 - Rigid non metallic conduits for electrical wiring.
- IS: 3419 - accessories for rigid non metallic conduits for electrical wiring

## 13. ELECTRICAL INSTALLATION

- IS: 1293 - 3- Pin Plug
- IS: 371 - two are three pin ceiling roses
- IS: 3854 - switches for domestic and similar purposes
- IS: 732 - code of practice for electrical wiring installation (system voltage not exceeding 650 volts)
- IS: 5216 - guide for safety procedures and practices mini electrical work
- IS: 3043 - code of practice for earthing
- IS: 3646 - code for practice for interior illumination Part 2
- IS: 1944 - code of practice for lighting of public thoroughfares
- IS: 3106 - guide for selecting of electrical equipments for hazardous areas
- IS: 800 - code of practice for use of structural steel in general building construction.
- IS: 2633 - methods of testing uniformity of coating on zinc coated articles
- IS: 6005 - code of practice for phosphate iron and steel.

## 14 Cables

- IS: 694 - PVC insulated cables for working voltage up to and including 1100V

## 15 Lighting Fixtures and Accessories:

- IS: 1913 - general and safety requirements for electric lighting fittings
- IS: 3528 - water proof electric lighting fittings
- IS: 4012 - dust proof electric lighting fittings
- IS: 4013 - dust tight electric lighting fittings
- IS: 1947 - specification for floodlights
- IS: 5077 - specifications for decorative lighting out fits

- IS: 2418 - tubular fluorescent lamps

- IS: 1258 - specifications for bayonet lamp holders
- IS: 3323 - bi-pin lamp holders for tubular fluorescent lamps
- IS: 1534 - ballasts for use in fluorescent lighting fittings (part 1)
- IS: 1569 - capacitors for use in fluorescent lighting fittings
- IS: 3324 - holders for starters for tubular fluorescent lamps
- IS: 416 - CFL lamps
- IS: 3553 - water tight electric fittings
- IS: 280 - MS wire general engineering purposes

## **16. Testing of cables**

High voltage tests should be undertaken to ensure that no damage has occurred during the laying operation and that the joints are in order. Cables of 1.1 KV suitable for low and medium voltage should with stand for 15 minutes, 2000 volts D.C. applied between the conductors and between each conductor and sheath. In absence of high pressure testing equipment it is sufficient to test for 1 minute with 1000 volts. If the test results are found to be not satisfactory the contractors shall arrange for having this set right at their cost, including removal of rejected materials. Re-laying etc.,

17. Cable laying and termination shall confirm to IS 1255.
18. Earthing of cables and cable glands shall confirm to IS 3043
19. The cable length given in bill of quantities are approximate and the contractor has to measure exact length of cables to be laid before commencement of work in presence of engineer in charge and consultant and give the size and quantities required to the to take further action by consultant and the Engineer in charge to Engineer in Charge. The measurements after laying cable are also to be taken jointly by contractor
20. Standards from Electrical Equipment: unless otherwise stipulated in this specification, all equipment or material covered under this specification shall be designed, manufactured and treated in accordance with latest standards of Indian standards specifications.

All equipment shall confirm to latest Indian electricity rules, Indian electricity act and Indian insurance rules as regard safety. Earthing and other essential provisions specified in for installation and operation of electrical equipments.

Extreme care shall be taken to make enclosure for switch gears proof against rodents lizards and other creeping vermin.

Continuity of power supply is to be maximum consideration and the design of the equipment shall be such as to simplify inspection maintenance and testing at site. This shall include all reasonable and required provisions for safety of operating personal and maintenance personal.

## 21. Cable Trays

Cable tray is of perforated type and is to be fabricated with mild steel sheet of thickness not less than 2 mm and Hot dip Galvanized with a thickness of 80 Microns galvanization.

Minimum thickness of the sheet is 2 mm and also the tray is to be provided with cover, fixing Hardware.

The scope of work included supply and erection of fixing accessories also. No extra cost will be paid for the supports. Also Vertical and Horizontal bends are to be supplied wherever required. The measurement of cable tray bends will be done in running meters only. Installation charges for this will not be paid separately and the same is included in the scope of work.