

## ACCEPTANCE FORM

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

**REF        :                    HYD/CTE/PFD/115/CIVIL/417 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 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 Bill of Quantities and at which rate the items specified amount to **Rs. 29,83,290/- approx .**

I/We are depositing as Earnest Money a sum of **Rs. 74,582/-** 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 – CIVIL & INTERIOR WORKS**

**REF :                        HYD/CTE/PFD/115/CIVIL/417 Dated 20.04.2017**

**1.SIMULATOR ROOM  
2.EMM 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 Sumulator-I building to accommodate ATR 72-212 Simulator at CTE, Ferozguda, Hyderabad - Civil & Interior 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 4th 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) Copy of list of works on hand.
- 3) Latest IT Clearance Certificate & Copy of PAN Card.
- 4) 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. 74,582/-** as EMD and DD for **Rs.1000/-** towards cost of tender drawn in favour of Air India Limited, & Acceptance form and also the following documents.
- B) Tender document duly Signed
  - C) Eligibility Credentials including work orders and completion certificates etc.
- b. **Envelope No.2 :** Only Price bid i.e. B.O.Q completed in all respects & 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 in 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.

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. 74,582/-**
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 in each RA Bill.Total number of bills shall be four i.e. . 3 Running Bills & 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

EMPLOYER

CONTRACTOR

## INDEX TO GENERAL CONDITIONS OF CONTRACT

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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 0.5% 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 charges 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**

S.NO. (1)	NAME OF THE MINERAL (2)	RATE OF SEIGNIORAGE FEE (RS) (3)
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 (i) Colour  (ii) White  (iii) Black	Rs. 7/- (Rupees Seven) Per Sq.Mt or Rs.88/- (Rupees Eighty Eight per MT, whichever is higher.  Rs. 5/- (Rupees five) Per Sq.Mt or Rs. 55/- (Rupees fifty five) per MT, whichever is higher  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	Rs.3850/- (Rupees three thousand eight hundred and fifty only) per kiln per annum for bricks and Tiles.

	including Mangalore tiles.	
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**(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 the Security Department, on submission of 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 been executed with materials or workmanship, not in accordance with the contract/drawings and specifications or instructions etc., the contractor shall forthwith carry out such orders at his own cost. In case of default on the part of the contractor to carry out such orders, the Employer shall have the power to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental thereto shall be borne by the Contractor, and shall be recoverable from the contractor by the Employer, or may be deducted by the Architect, from any money due or may become due to the contractor for this work or on any other account.

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

25. **DEFECTS AFTER COMPLETION:**

Any defect, shrinkage, settlement or other faults which may appear within 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 contract shall also indemnify the employer against all claims which may be made upon the Employer whether under the Workmen’s compensation act or any other statute in force during the currency of this contract or at common law in respect of any employees of the contractor or of any sub-contractor and shall at his own expense

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

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

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

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

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

The contractor shall within 14 days from the date of commencement of the work insure the works at his cost and keep them insured until one month after the works are taken over by the Employer or three months after the date of completion whichever is earlier, against loss or damage by fire and usual risks other than fire against which insurers generally provide cover in a CONTRACTOR'S ALL RISK POLICY, with an insurer to be approved the Architects, in the joint names of the Employer and contractor (the name of the former being placed first in the policy), progressively for the full amount of the contract, in three stages, beginning with 1/3 of the contract value, and for any further sum as called upon to do so by the Architect, with the prior written consent of the Employer, the premium of such further sum being allowed to the contractor as an authorised extra. Such policy shall cover the property of the Employer only and Architects and surveyor's fees for assessing the claim and in connection with his services generally in reinstatement and shall not cover any property of the contractor 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 dispatch, such notice shall not be unreasonably given and must signify that it purports to be a notice under the provisions of this clause and must specify the acts or defaults on the part of the contractor upon which it is based. After such notice shall have been given, the contractor shall not be at liberty to remove from the site of works, or from any ground contiguous thereto, the site of works, or from any ground contiguous thereto, any plant or materials belonging to him which shall have been placed thereon for the purpose of work, and the Employer shall have lien upon such plants and materials to subsist from date of such notice being given until the notice shall has been complied with, provided always that such line shall not under any circumstances subsist after the expiration of 30 (thirty) day from the date of such notice given, unless the employer shall have entered upon and taken possession of the works and site, as hereinafter provided.

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

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

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

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

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

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

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

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

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

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

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

- e. If the contractor neither produces the receipt nor gives authority to the Architect to issue a certificate in favour of such sub-contractor direct, the Architect may upon giving the contractor SEVEN DAYS NOTICE in writing of his intentions to do so, issue to the sub-contractor such certificate direct to the Employer and obtain a receipt from the sub-contractor, which receipt shall be deemed as a discharge for the amount of such certificates, as though given by the contractor. In such event, the contractor shall not be allowed any profit he may have added in the Schedule of Quantities upon such sub-contract.
- f. The exercise of the option before referred to by the Contractor and the issue of certificates, as before described to sub-contractor direct of certificates by the Architect, shall not however, relieve the contractor from any of the liabilities in respect of insufficient, faulty or 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 in 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 time 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:

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 contracors 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 PROJ**

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 in each RA Bill ,total number of bills shall be four i.e.. 3 RA Bills & final Bill 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 fire 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.



## INDEX FOR SPECIFICATION FOR CIVIL WORK

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- A. EXCAVATION/SOIL TREATMENT
  
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## SPECIFICATIONS FOR CIVIL WORK

### MATERIALS – GENERAL

- a. All the materials required in the construction shall conform to the relevant latest Indian Standards specifications unless otherwise indicated. For patented products, the specifications and instructions of the manufacturers will be followed. In case where there are no specifications, then Architects/Employers instructions will be followed. In Case of any discrepancy/dispute regarding specifications, Architect and Employer's decision will be final and binding.
- b. Materials shall be transported, landed and stored at the site or elsewhere in such a manner as to prevent any damage, deterioration or contamination.
- c. The samples of all materials shall be got approved by the Architect and Employer prior to ordering and shall be kept at site office of the Architect & Employer. The materials brought to site shall conform in all respects to the approved samples. Any work executed, without approval for the materials, is liable to be rejected. Accordingly, it will be paid either at tender rates or reduced rates or not to be paid at all, at the discretion of Architect & Employer, whose decision will be final and binding.
- d. The Architect & Employer shall have an option to have any materials tested at the contractor's cost to find out whether they are in accordance with the specifications. All Bills, vouchers, test certificates shall be produced for inspection on demand by the Architect & Employer to ascertain the quality/ suitability of materials.
- e. The materials shall be stacked at site as directed by the Architect & Employer.
- f. Any materials rejected by the Architect & Employer, shall be removed by the contractor from the site within 24 hours at his own cost.
- g. The contractor shall include the elements of wastage of materials in his rates for various items.
- h. The Architect & Employer shall have the power to cause the contractors to purchase and use such material from any particular source at his opinion be necessary for proper execution of work.

A. **EXCAVATION:**

A – 1. **EXCAVATION AND EARTH WORK:**

A.1.1. **Examination of the Site:**

The contractor shall visit and ascertain the nature of the ground to be excavated and the works to be done and shall accept all responsibility for the cost of the work involved.

A.1.2. **Setting out:**

The contractor shall set out the center line of the building or other involved works after clearing the site and get the same approved from Architect & Employer. It shall be the responsibility of the Contractor to install substantial reference marks, bench marks etc., and maintain them as long as required by the Architect & Employer. The Contractor shall assume full responsibility for proper setting out, alignment, elevation and dimension of each and all parts of the work.

A.1.3. **Ground level and Site level:**

Before starting the excavation, the requisite block levels of the entire plot shall be taken by the contractor, in consultation with the Architect & Employer, and a proper record of these levels kept, which shall be jointly signed by the contractor and the Architect & Employer. A block level plan showing all ground levels of the plot shall be prepared and shall jointly be signed by the contractor and the Architect & Employer. The levels shall be taken at intervals of 3M, or even less, as required and directed.

A.1.4(a) **Excavation and Preparation of foundation for concreting:**

Excavation shall include removal of all materials of whatever nature at all depths and whether wet or dry, necessary for the construction/foundation and sub-structure (including mass excavation for underground reservoirs, where applicable) exactly in accordance with lines, levels, grades and curves shown in the drawings or as directed by the Architect & Employer. The bottoms of excavation shall be levelled both longitudinally and transversely or sloped as directed by the Architect & Employer.

Should the contractor excavate to a greater depth or width than shown on the drawings, he shall at his own expense fill the extra depth or width in cement concrete in proportion as directed by Architect & Employer but in no case with concrete of mix leaner than 1:4:8 cement concrete, at no extra cost.

The contractor shall report to the Architect & Employer when the excavations are ready to receive concrete. No concrete shall be placed in foundations until the contractor has obtained Architect and Employer's approval. In case, the excavations done through different stratas of soil and if the same are payable as per provisions in the Schedule of Quantities, the contractor shall get the Dimensions/levels/ heights of each of the strata recorded/decided by the Architect & Employer for payment. If no specific provision is made for different strata in the schedule of quantities, it will be presumed that excavation shall be in all types of soil and the contractor's rate shall cover for the same viz., for all types of soil (only excluding hard rock, when so specifically provided for).

After the excavation is passed by the Architect & Employer and before laying the concrete, the contractor shall get the depth and dimensions of excavations and levels (and nature of strata as applicable as per Schedule of Quantities like hard rock, soft rock etc.,) and measurements recorded from the Architect & Employer.

**Measurement of Excavation in Rock:**

Excavated soft/disintegrated rock and hard rock should not be mixed up and shall be stacked separately for purpose of payment. (Even otherwise they shall be stacked separately, and not mixed up with soils). Minimum of the quantities arrived at from

- i) Levels/pit measurements for sheet rock.
- ii) Volume based on stack measurements reduced by 40% to account for voids in stacks for Builders/overcops.

shall be considered for purpose of payment.

- A.1.4(b) The contractor shall be responsible for safe custody of these stacks, till the same are taken over by the Employer or completion of work, whichever is earlier. The rates quoted for excavation shall include costs of all these and nothing extra shall be paid towards the same.

A.1.5 **Shoring:**

The sides of the excavations should be timbered and shored in such a way as is necessary to secure them from falling in, and the shoring shall be maintained in position as long as necessary. The contractor shall be responsible for the proper design of the shoring to hold the sides of the excavation in position and ensure safety against injury to persons. The shoring shall be removed as directed after the items for which it is required are completed. In case the contractor wants to step/slope the sides of foundation suitably, in lieu of shoring, he should get prior approval for it from the Architect & Employer and nothing extra shall be paid for same and as well for the additional back fill necessitated by it, viz., items of excavations and backfilling be limited to excavations as per plans only and no quantities involved in making slopes and consequent back filling will be paid for.

A.1.6. **Earthwork for leveling of the area:**

Before earthwork is started, the area coming under cutting and filling shall be cleared of shrubs, rank vegetation, site grass, brushwood and trees and saplings of all girths, and rubbish removed outside the periphery and as directed by the Architect & Employer. The roots of trees shall be removed to a minimum depth of 600mm below ground level or 300mm below formation level whichever is lower and the hollows filled up with approved earth, levelled and rammed to the satisfaction of the Architect & Employer.

Under no circumstances undermining or undercutting be allowed. The final surface shall be neatly dressed and compacted to the required levels. Any extra cutting done, shall be filled back with approved earth, duly consolidated at

contractor's cost. During the execution of the work, the natural drainage of the area shall be maintained by the contractor.

The approved earth from cutting shall be directly used for filling as directed. The filling shall be done in layers of not more than 150mm, each layer watered and consolidated with roller, not less than 10 M.T. roller. The earth used for filling shall be free from all roots, rubbish, grass, and all lumps and clods shall be broken before filling. The top surface of finally finished area shall be neatly dressed and compacted.

A.1.7 **Protection:**

If instructed by the Architect & Employer all foundation pits, and similar excavations shall be provided with strong fence and marked with red lights at night to avoid accidents. Adequate protective measures shall be taken to see that the excavation does not affect or damage adjoining structures. All measures required for the safety of the excavations, the people working in and near the foundation trenches, property and the people in the vicinity shall be taken by the contractor at his own cost, he being entirely responsible for any injury and damage to property caused by his negligence or accident due to his constructional operations.

A.1.8 **Stacking of excavated materials:**

All materials excavated will remain the property of the Employer and rate for excavation includes sorting out of useful materials and stacking them on site as directed. Materials suitable and useful for back filling, plinth filling or leveling of the plot or other use shall be stacked in convenient places but not in such a way as to obstruct free movement of men, animals and vehicles or encroach on the area required for constructional purposes.

A.1.9 **Backfilling:**

All shoring and formwork shall be removed after their necessity ceases and trash/slush of any sorts shall be cleaned out from the excavation. All space between foundation masonry or concrete and the sides of excavation shall be refilled to the original surface with approved excavated materials in layers, each not exceeding 150mm in thickness, watered and rammed. The filling shall be done after concrete or masonry is fully set and done in such a way as not to cause undue thrust on any part of the structure. Where excavated materials are to be used for refilling, it shall be brought from the place, where it is temporarily stacked, and used in refilling.

No excavation of foundations shall be filled in or covered up, until all measurements of excavations, masonry, concrete and other works below ground level are jointly recorded. Black cotton soil shall not be used for back filling or in plinth filling. In case back filling is done without recording measurements of foundation work, the contractor will have to remove back filling at his cost for taking measurements. Otherwise, the foundation work will not be measured and will be paid for.

A.1.10 **Dewatering:**

Rate for excavation shall including bailing or pumping out water, which may accumulate in the excavation during the progress of work either from seepage, springs, rain or any other cause whatsoever, and diverting surface flow, if any, by bunds or any other appropriate means. Pumping out water shall be done in such an approved manner as to preclude the possibility of any damage to the foundation trenches, concrete or masonry or any adjacent structure. When water is out water shall be from auxiliary pits of adequate size, dug slightly outside the building excavations, the depth of auxiliary pit shall be more than the working foundation trench levels. The auxiliary pit shall be refilling with approved excavation materials after the dewatering is over.

The excavation shall be kept free from water:

- a. During inspection and measurement.
- b. When concrete and/or masonry are in progress and till they come above the natural water level and
- c. Till the Architect & Employer consider that the concrete/mortar is sufficiently set.

A.1.11 Rates quoted for excavation shall include all these (A.1.1. to A.1.10) operations to the extent required for completing the work please see A.3 also, unless otherwise specifically provided for.

A.1.12 **Surplus excavated materials:**

The item of removal of surplus excavated materials shall only be undertaken by the contractor when specific instruction in this regard has been obtained from the Employer/Architect. The contractor must also secure the approval of the Architect & Employer regarding the quantity of surplus materials to be removed prior to commencement of this item of work. The contractor shall dispose of surplus excavated materials anywhere with in the site as required and as directed. He will spread the same in layers of 150mm each and as directed. Contractor will take the decision of Architect & Employer for disposal of surplus excavated material and no extra will be paid for double handling of the same, if any. Wherever surplus or unsuitable material is to be disposed off outside the site, it shall be dumped and spread at the places to be specifically approved and as directed by the Architect & Employer, with all leads and lifts (unless otherwise provided for), and shall be paid as a separate item, as stated in the schedule of quantities.

A – 2 **ROCK EXCAVATION:**

A.2.1 **Ordinary Soft rock comprises of:**

- a. Limestones, sandstones, laterite or disintegrated rock which can be split or be quarried with crow bars or wedges.
- b. Unreinforced cement concrete, stone masonry in cement mortar.

A.2.2. **Hard rock comprises of:**

- a. Any rock or cement concrete for the excavation of which the use of mechanical plant or blasting is required, or which cannot be removed with iron crow bars.
- b. Reinforced cement concrete below ground level.
- c. Where blasting is prohibited for any reasons, the excavation has to be carried out by chiselling, wedging or any agreed method.
- d. Rock which requires chiselling/blasting/compressor.

A.2.3 Hard rock encountered in excavation work shall be removed by chiselling or wedging as directed by the Architects/Employers and no blasting is permitted.

A.2.4 Rock excavation shall comply with the specifications for excavation, except that it shall be of soft or hard rock.

A.2.5 Rock excavation will be measured and paid for quantities computed from (i) pit measurement/levels or (ii) by stack measurements reduced by 40% to account for voids, whichever is less.

A –3 **RATES TO INCLUDE FOR EXCAVATION ITEMS:**

Apart from other factors mentioned elsewhere in this contract, rates for the item of excavation shall also include for the following:

A.3.1. Clearing the site of all bushes, grass, roots of trees etc., and carting away from the site.

A.3.2. Setting out works, profiles etc., as required.

A.3.3. Providing shoring and shuttering to avoid slipping/sliding of soil and to protect adjacent structures, and subsequently removing the same.

A.3.4. Bailing and pumping out water as required and directed.

A.3.5. Excavation at all depths (unless otherwise specified in the schedule of quantities) and removal of all materials of whatever nature, wet or dry, with all leads (unless otherwise provided for) and necessary for the construction, foundation, underground reservoir etc., preparing bed for laying concrete, for roads etc., and completing the work.

A.3.6. Sorting out useful excavated material and conveying beyond the structure and stacking them neatly on the site for back filling or reuse etc., as directed.

A.3.7. Necessary protection including labour, barricades, materials and equipments etc., to ensure safety and protection against all risks and accidents.

Please see A.1.11.

A – 4 **MODE OF MEASUREMENT:**

- A.4.1 Excavation for foundation of columns, beams, walls, and the like shall be measured and paid net as per drawing, dimensions of concrete (bed concrete where so specified) at the lowest level. In regard to length and breadth and depth shall be computed from the concerned excavation levels and ground level taken before excavation. Any additional excavation required for working space, formwork, planking, dewatering and strutting etc., shall not be measured and paid for separately but rates quoted for excavation shall include for all these factors. No increase in bulk after excavation shall be paid for. Excavation beyond dimensions of mass concrete for foundation as per drawing or below required depth shall not be paid for. Any excavation beyond required level shall be filled back with cement concrete of mix not leaner than 1:4:8, at his cost.
- A.4.2 Measurement for general excavation/filling in roads/areas shall be made on sectional measurement by taken levels jointly before starting the work and after completion of the work and shall be worked out on average area method. This will give the total quantity of excavation. Levels shall be taken at 3m intervals or closer as required and directed by the Employer & Architect.
- A.4.3. In the case of filling by morrum brought from outside, the quantities will be worked out from levels, as stated above, and shall be calculated/checked with lorry measurements, after deducting 20% for shrinkage. In case of inadequate information regarding lorry measurement and/or number of lorry trips, Employers/Architect's decision will be final and binding.
- A.4.4 In case of all fillings, in exposes and open areas, 10% deduction will be made from the total quantities in the running bills, out of which 5% will be deducted permanently and balance 5% will be paid after expiry of the defects liability period of one year or one monsoon, whichever is more and after making good levels, surface etc., as required and directed.
- A.4.5 In case of soft and hard rock, payments shall be limited to minimum of the quantities arrived at from levels or stack measurements (after deducting 40% for voids). The material shall be stacked on fairly level ground and places, as directed. All depressions over the required final levels will be made good by P.C.C. of mix not leaner than 1:4:8 as directed, at no extra cost.
- A.4.6 The quantity of excavated materials disposed off outside the premises will be worked out on the basis of total quantity of excavation less follows:
- A.4.6.1. Quantity of excavated (other than rock) materials used for filling (on the basis of levels).
- A.4.6.2. Quantity of rock excavation (Stack measurements less 40% or level basis).
- A.4.6.3. Quantity of excavated materials disposed of within the site (on the basis of levels).



The quantity worked out on these basis will be checked with lorry measurements, with deduction of 20% for looseness/shrinkage. In case of any discrepancy, Architect & Employer's decision will be final and binding.

A.4.7. Total quantity of excavation and filling will be finalised on the basis of levels only. The total quantity of excavation will be checked by adding quantities of the following items:

A.4.7.1. Material used for filling wherever required (on level basis).

A.4.7.2. Rock excavation minimum of quantity arrived from stack measurements with 40% voids) or based on levels.

A.4.7.3. Surplus/unsuitable material disposed within site on level basis (deducting 10% voids if consolidated, otherwise deducting 20%). In case of lock 40% voids will be deducted.

A.4.7.4. - do – disposed outside site (on lorry measurements and by deducting 20% for looseness/shrinkage if transported by lorries, otherwise on basis of levels and by deducting 10% voids if the fill is consolidated – otherwise 20% voids shall be considered.

In case of any discrepancy, the decision of Employer & Architect shall be final and binding for the above sub-divisions A.4.7.1, A.4.7.2, A.4.7.3 & A.4.7.4 as stated above.

A.4.8. Whenever the contractor is instructed to reuse the excavated rock for works such as masonry, soiling, filling etc., the measurement for such items shall be the same/equivalent as that of rock measured under excavation items earlier. The contractor will not be paid for double handling of such excavated materials.

A – 5 **SOIL TREATMENT:**

Soil treatment for pre-construction termite control shall conform to the following:

A.5.1.	<b>Chemicals</b>	<b>Concentration</b>
	Chlorophyriphos Emulsifiable Concentrate 20%	1% strength applied in oil solution or water emulsion.

A daily record shall be maintained by the contractor indicating quantities of chemical brought to site, used on work with location/stage of treatment (the quantum/ area of work done) and the upto date quantity of chemical consumed for the work and upto date balance at close of work on that day. This record book shall be property of the employer.

A.5.2. **Method of application and treatment - All as per IS 6313 (Part – II) – 1981.**

A.5.2.1 **Conditions of formations:**

Barrier shall be complete and continuous under the whole of the structure to be protected. All foundations shall be fully surrounded by and in close contact with

barrier of treated soil. Each part of the area treated shall receive the prescribed dosage of chemical.

**A.5.2.2. Time of Application:**

Soil treatment should start when foundation trenches and pits are ready to take mass concrete in foundations. Laying of mass concrete should start when the chemical emulsion has been absorbed by the soil and the surface is quite dry. Treatment should not be carried out, when it is raining or when the soil is wet with rain or subsoil water. The foregoing requirement applies also in the case of treatment to the filled earth surface within the plinth area before laying the sub-grade for the floor.

**A.5.2.3. Disturbance:**

Once formed, treated soil barriers shall not be disturbed. If, by chance treated soil barriers are disturbed, immediate steps shall be taken to restore the continuity and completeness of the barrier system.

A.5.2.4. The chemical emulsions shall be applied uniformly at the prescribed rate in all the stages of the treatment. A suitable hand operated compressed air sprayer or watering can should be used to facilitate uniform dispersal of the chemical emulsion. On large jobs, a power sprayer may be used to save labour and time.

In the event of waterlogging of foundation, the water shall be pumped out and the chemical emulsion applied when the soil is absorbent.

A.5.2.5. Treatment for Masonry foundations and Basements as per clause 6.2 of IS 6313 (Part II) – 1981.

A.5.2.6. Treatment for RCC Foundations and Basements as per clause 6.3 of IS 6313 (Part II) – 1981.

A.5.2.7. Treatment of top surface of plinth filling as per clause 6.4 of IS 6313 (Part II) – 1981.

A.5.2.8. Treatment of junction of the wall and the floor as per clause 6.5 of IS 6313 (Part II) – 1981.

A.5.2.9. Treatment of soil along external perimeter of building as per clause 6.6 of IS 6313 (Part II) - 1981.

A.5.2.10. Treatment of soil under Apron along External perimeter of the building as per clause 6.7 of IS 6313 (Part II) – 1981.

A.5.2.11. Treatment for walls retaining soil above floor level as per clause 6.8 of IS 6313 (part II) – 1981.

A.5.2.12. Treatment of soil surrounding pipes, waster and conduits as per clause 6.9 of IS 6313 (Part II) – 1981.

A.5.2.13. Treatment for expansion joints as per clause 6.10 of IS 6313 (Part II) – 1981.

A.5.3. **Guarantee : 10 years (as per form enclosed on requisite stamp paper)**

In the unlikely event of any re-treatment becoming necessary subsequently during the guarantee period, necessary inspection and re-treatment, as required, shall be carried out, free of cost, by the contractor.

A.5.4. **The rate to include:**

The contractor should include in his rates given in schedule of quantities in Sq. meter area basis, all the stages of treatment, Viz., bottom of foundations, sides of trenches, underside of the floors, underside/damp proof courses, outer faces of external walls upto plinth protection, and around all pipe lines at ground level etc., and finally the back fill all around and in the building as per detailed specifications mentioned above. Where the rate of applications of the insecticide has not been specified clearly, the rates of application of chemical should be so governed that during the guarantee period, no trouble may arise. Payment will be made on the plinth area measurement of ground floor only, and the rate for the same should include all the stages of work as mentioned above and no extra on any account will be entertained.

B. **PLAIN AND REINFORCED PRECAST CONCRETE WORK:**

B.1. **APPLICATION OF SPECIFICATIONS:**

B.1.1 Notwithstanding what is stated in the specification herein, detailed architectural and structural drawings and notes appended there on shall be deemed to form part of the specifications and to supersede these, in case of any discrepancy.

B.2. **GENERAL:**

B.2.1 The structural and architectural drawings shall be studied thoroughly and any discrepancy in the dimensions on the drawings or any other point not clear to the contractor shall be brought to the notice of Architect & Employer well in advance, and got decided from them before further proceeding with the work.

B.2.2. No concrete works shall be carried out in the absence of authorised and qualified supervisor of the client/Architect.

B.3. **MATERIALS:**

B.3.1. **General:**

B.3.1.1. All the materials constituting the concrete shall conform to the relevant latest Indian Standard Specifications, unless otherwise indicated.

B.3.1.2. Materials shall be transported, handled and stored on the site or elsewhere in such a manner as to prevent damage, deterioration or contamination.

B.3.1.3. All the materials such as sand, coarse aggregates, cement and water shall be got tested in any approved laboratory, as directed by the Employer & Architect,

before starting the concrete work. During construction also all these materials will have to be tested, as often as deemed necessary by the Employer & Architect.

**B.3.2. Cement:**

Cement shall be ordinary Portland cement 53 grade and of approved brand confirming to IS 1812 – 1989 unless otherwise specified. The contractor shall procure cement of makes – L & T, RAASI, KCP, ACC, Coramandal. The contractor may use ordinary Portland Cement of 53 grade of the makes specified above by obtaining written permission from the Architects/Air India Ltd,. It shall be stored by the contractor in a dry, watertight and properly ventilated structure as per specified conditions. The cement shall be stacked on a dry raised platform, 1'-0" above the floor level and shall be stacked in the sequence of receipt of consignments. Not more than 10 bags should be kept in one stack. Any cement which has deteriorated, caked or which has been damaged due to any reason whatsoever shall not be used. Cement, concerning which there is any doubt, shall be got tested by the contractor at his cost and used, only if found satisfactory. Condemned/damaged cement shall be removed immediately from the site by the contractor at his cost.

Daily account of receipt and use of cement bags shall be maintained by the contractor in the proforma approved by the Architects/Employer and got checked by the Employer's Engineer at site. Cement should be used in the order in which it is received at site. Cement stored for more than three months shall be got tested, before using it in the work.

**B.3.3. Sand:**

Sand shall be well graded, coarse in texture, clean, hard and free from salt, earth, clay or any other harmful material. Before starting the work, the contractor shall get samples of sand, locally available from different sources, if required, and the same shall be got tested as per latest relevant B.I.S. codes for concrete work and to get the final approval of Employer & Architect. During the course of the construction or for any reasons it is observed that the sand, procured by the Contractor from previously approved source, is not upto the approved standard or it is not available in sufficient quantity required for the entire project, then the contractor will have to make such alternative arrangements to procure the sand of approved quality from any other source, even with longer lead at no extra cost. Sand shall be screened and washed, if required, as directed by the Employer & Architect/at no extra cost. Field tests shall be carried out regularly and as directed, to ensure the suitability/quality of the same. Silt content should not exceed 8% by volume or 5% by weight, and should be free from other deleterious materials. When sand is mixed by volume, necessary allowance shall be made for bulking, as required and directed to give correct mixture.

**B.3.4. Coarse Aggregate:**

Coarse aggregates shall consist of hard, dense, durable uncoated crushed Granite rock. It shall be free from soft, friable, thin or long laminated pieces. All aggregates should generally confirm to IS 383 – 1970. For reinforced cement concrete, the maximum size shall be not more than 20mm and minimum shall not be less than 5mm and shall be uniformly graded to the approval of Employer

& Architect. If locally available coarse aggregate is not suitable or is not sufficient in quantity, the contractor shall have to procure it from any other source, even with longer leads at no extra cost. As and when directed by Employer & Architect, aggregates shall be washed by approved methods at contractor's cost. Necessary tests shall be carried out, as and when required to ascertain about the suitability and grading of the aggregated, by the contractor at his cost.

**B.3.5. Water:**

Water shall be clean, fresh and free from organic or inorganic matters in solution or suspension in such amounts that may impair the strength or durability of the concrete. Water fit for drinking will generally be found suitable for use in concrete and plastering work. However water shall be tested periodically for its use in construction work.

**B.3.6. Reinforcement:**

**B.3.6.1. Mild steel bars:**

Mild steel reinforcement bars shall conform to I.S.432 – 1982 “Part I” Fe 410 – S, other qualities of steel shall not be acceptable.

**B.3.6.2. High strength deformed bars:**

Where deformed high strength reinforcement bars are specified, the contractor shall use tor steel, accompanied by a test certificate from the manufacturer, conforming to IS – 1786 – 1986 and shall be Fe 500 grade. Contractor shall bet steel reinforcement tested at his cost as and when required and directed by Employer & Architect.

Steel shall be from the main manufacturers i.e., SAIL/TISCO/VSP or any other manufacturer as approved by Architect & Employer.

**B.3.6.3. Cleaning of reinforcement:**

Before steel reinforcement is placed in position, the surface of the reinforcement shall be cleaned of loose rust or scaling, dust, grease and any other objectionable substances as required and directed.

**B.3.6.4. Bar bending schedule of reinforcement:**

On receipt of structural drawings, contractor shall prepare bar bending schedules of reinforcement and shall get it approved by the Employer & Architect, in advance before starting the work.

**B.3.6.5. Cutting and Reinforcement:**

Before steel reinforcement bars are cut, the contractor shall study the lengths of bars required as per drawings and shall carry out cutting, only to suit the sizes required as per drawings so that the wastage is minimum.

**B.3.6.6. Placing and Security:**

Reinforcement bars shall be accurately placed and secured in position and firmly supported or wedged by precast cement mortar concrete blocks of suitable mix, thickness and size, at sufficiently close intervals, so that the bars will not sag between the supports or get displaced during the placing of concrete or any other operation of the work. It is most important to maintain reinforcement in its correct position without displacement and to maintain the correct specified cover. The contractor shall be responsible for all costs for rectification required in case the bars are displaced out of their correct position.

**B.3.6.7. Binding wire:**

The reinforcement shall be securely bound wherever bars cross/lap or whenever required with 2 strands of suitable length of 18 gauge soft annealed steel wire.

**B.3.6.8. Welding:**

Welding of bars, in place of splicing, shall not be carried out, unless specifically authorised in writing by architect & employer, and the welding shall be as per relevant I.S. code of practice. However, no extra payment shall be allowed for the same.

**B.3.6.9. Bends etc:**

Bends, cranks, curves, etc., in steel reinforcement shall be carefully formed and shall strictly conform to the drawings/requirements, care being taken to keep bends out of winding. Otherwise, all rods shall be truly straight. If any bend/crank shows signs of cracking, such rods/bars shall be removed immediately from the site. For bending of bars to any curvature, minimum radius of 9 times diameter of the bar shall be used, unless otherwise specified in the drawings. However, in respect of standard hooks, the radius of bends shall be two times the diameter of bar. Heating of reinforcement of bars to facilitate bending will not be permitted. The bars shall always be bent cold. In case of mild steel reinforcement bars of larger sizes, where cold bending is not possible, they may be bent by heating, but only with written permission of the Architect & employer. Bars when bent shall not be heated beyond cherry red colour, and after bending shall be allowed to cool slowly, without quenching. The bars damaged or weakened in any way in bending shall not be used on the work. High strength deformed bars shall in no case be heated to facilitate bending or cranking.

**B.3.6.10 Inspection of Reinforcement:**

No concreting shall be commenced until the Architect & Employer have inspected the reinforcement in position and their approval obtained. A notice of at least 72 hours shall be given to the Architect & Employer by the Contractor for inspection of reinforcement. If in the opinion of the Architect & Employer any material is not in accordance with the specification or the reinforcement is incorrectly spaced/bend or otherwise defective, the contractor shall immediately remove such materials from the site and replace with new ones and rectify any other defects in accordance with the instruction of the Architect and Employer and to their entire satisfaction.

**B.3.6.11 Net Measurement:**

Reinforcements shall be placed as shown on the structural drawings and payment will be made based on and limited to the net measurements, as per drawings. Only such laps, dowels, spacers, chairs etc., in reinforcement specifically shown on drawings shall be paid for. The contractor shall allow in his quoted rates for all wastages and rolling margins, which will not be paid for. The measured length of all the bars shall be converted into weight, as per standard weights given in latest I.S.Schedule. In case the weights of any bar/bars are less than the required weight (beyond rolling margins specified by B.I.S.) the same shall not be used on work. If used, the same shall be replaced with proper ones, at no extra cost.

**B.3.6.12 Cover for Reinforcement:**

Unless otherwise specified in drawings, cover shall be measured from outer surface of the main reinforcement and shall be as follows:

- a. For beams and lintels – 25mm or dia of the bar, whichever is higher.
- b. For slabs, chajjas, canopies, pardas – 15mm or dia of the bar, whichever is higher.
- c. Columns – 40mm, or dia of bar, whichever is higher.
- d. Footings – 50mm.
- e. Cover blocks shall be of (1:1½:3) P.C.C. and of thickness, not less than the cover specified. Cover blocks of 1:2 cement mortar may be allowed, if specifically permitted by the Architect. PVC cover blocks of required cover is also allowed.

**B.3.6.13. Rates quoted for reinforcement, in addition to any factors mentioned elsewhere, shall also include for:**

- a. Stock piling of reinforcement as described.
- b. Decoiling, straightening (coiled bars, bent bars).
- c. Removal of rust and every other undesirable substances, using wire brushes etc., as required/directed.
- d. Cutting to required lengths, labour for bending and cranking, forming hooked ends (if required), handling, hoisting, placing in position, tying binding with binding wire and every thing necessary to fix reinforcement in work as per drawings/requirements.
- e. Cost of binding wire required as described.
- f. Fabricating and fitting reinforcement, in any structural member, irrespective of its location, shape, dimension and level.
- g. Cost of precast concrete/mortar cover blocks of proper size or nylon spacers to maintain cover and holding reinforcement in position.

h. Work at all levels.

B – 4 **FORM WORK:**

B.4.1. **Materials and design:**

Contractor shall get the materials, sizes/arrangements and method of supports, details of joinery, and design of formwork for beams, slabs, columns etc., approved by Architect, before starting the formwork.

B.4.2. **Design of Form work:**

- i) Form work shall be adequately designed to support the full weight of workers, reinforcement, freshly placed concrete, effects of tamping/vibrating, etc., without yielding/settlement or deflection, and to ensure good and truly aligned concrete finish in accordance with the construction drawings.
- ii) The formwork shall be so designed that the sides of the beams can be first struck, leaving the soffit of beams and supporting props in positions. Props shall be designed to allow accurate adjustment and to permit of their being struck without jarring the concrete.
- iii) The design of form work shall be got approved from the Architect & Employer before starting this item of work.

B.4.2.1 The form work shall be of approved plywood (Marine or boiling waterproof) and not less than 12mm thick and with proper supports as may be approved by Architect & Employer. As an alternative sufficiently rigid steel shuttering with appropriate supports may be used, as may be approved by Architect & Employer at not extra cost. In every case, joints in the shuttering are to be such as to prevent loss of liquid from concrete. In case of steel shuttering, the joints must be perfectly close and sealed with craft paper or any other types of approved sealing materials. If any particular material or materials are specified in the Schedule of Quantities for form work, only such particular/ specified material or materials shall be used in the work. The form work shall be constructed so as to remain sufficiently rigid during placing and vibrating/tamping of the concrete. All shuttering and framing must be adequately stayed and properly supporting the concrete during period of hardening. The forms shall have sufficient strength and rigidity to hold concrete and withstand the forces/pressure of people and machinery working ramming and vibration, and more so when the concrete is tamped/vibrated. The surface of all forms in contact with concrete shall be clean, rigid, watertight, and smooth. Suitable devices shall be used to hold corners, adjacent ends and edges of panels of other forms together in accurate alignment.

B.4.2.2. The form work shall conform to the shape, lines and dimensions to suit the RCC members, as shown in the drawings and be so constructed. A camber of 6mm in all directions, for every 5 meter span, in shuttering for all slabs and beams shall be given to allow for unavoidable sagging, due to self weight (including concrete, workers, machinery etc)/compaction of other causes.



B.4.2.3. Temporary openings or windows shall be provided at the base of column forms, and at other points, where necessary to facilitate cleaning and observation, immediately before concrete is deposited. These shall be properly closed, before placing concrete in position.

B.4.2.4. **Vertical centering/staging:**

The vertical shuttering shall be carried down to such solid surface as is sufficiently strong to afford adequate support and shall remain in position until the newly constructed work is able to support itself. Props shall be steel tubes with extension pieces and securely braced against lateral displacement. The spacing of steel tubes shall be designed to carry loads imposed on it without undue deflection of the members, supported by the props. The spacing and sizes of props shall be approved by the Architect & Employer and any alterations suggested by them shall be carried out at contractor's expense. Pipe bracing shall be provided, as required/directed, without extra cost. The contractor shall allow in his rates for providing props and struts upto any height as shown in the working drawings issued to the contractor from time to time. Wooden props and bracing can only be allowed under special sanction of the Architect & Employer.

B.4.2. **Design of form work:**

- i) Form work shall be adequately designed to support the full weight of workers, reinforcement, freshly placed concrete, effects of tamping/vibrating, etc., without yielding/settlement or deflection, and to ensure good and truly aligned concrete finish in accordance with the construction drawings.
- ii) The form work shall be so designed that the sides of the beams can be first struck, leaving the soffit of beams and the support props in position. Props shall be designed to allow accurate adjustment and to permit of their being struck without jarring the concrete.
- iii) The design of form work shall be got approved from the Architect & Employer before starting this item of work.

B.4.3. **Water tightness:**

It is the contractor's responsibility to ensure that the forms are checked for water tightness during progress of shuttering work and also just before concreting operation starts and to make good deficiencies, if any. If instructed by the Architect & Employer, building paper will have to be used, without any extra charge for the same, viz., to have adequate water tightness.

B.4.4. **Cleaning and treatment of forms:**

All rubbish, particularly chippings, shavings and saw dust, etc., shall be removed from the interior of the forms, before the reinforcement is placed in position and as well before the concrete is placed. The form work to be in contact with the concrete shall be cleaned and thoroughly wetted or treated with an approved composition before placing concrete. Care shall be taken that such approved composition is kept out of contact with reinforcements. Interior of all moulds and boxes must be thoroughly washed (water) with hose pipe or otherwise so as

to be perfectly clean and free from all extraneous matter before depositing of concrete. Prior approval of the form work should be obtained from Architect/Employer, before placing reinforcement on the form work.

**B.4.5. Stripping:**

Form shall be left in place until their removal is authorised by the Architect & Employer and shall then be removed with due care, so as to avoid injury to concrete and or workmen. In no circumstances the forms shall be struck, until the concrete develops a strength of at least twice the stress, to which the concrete may be subjected to at the time of striking. The strength referred to shall be that of concrete, using the same cement and aggregates with the same proportions, and cured under conditions of temperature and moisture similar to these existing on the work. Where possible, the form work should be left longer, as it would assist in more effective curing.

**B.4.6. Stripping time:**

In normal circumstances (general where temperatures are above 20 degrees C and where ordinary Portland cement is used) forms shall be struck after expiry of the following periods, unless otherwise specifically directed at site by the Architect & Employer.

	LOCATION	STRIKING TIME IN CLEAR DAYS (OPC) (AFTER THE DAY OF CASTING)
a.	Vertical sides of walls slabs, beams and columns	4
b.	Bottoms of slabs upto 4.5m span.	7
c.	Bottom of slabs above 4.5m span/ bottoms of beams & arch rib bottoms upto 6m span.	14
d.	Bottom of beams over 6m span and arch rib bottoms above 6m span.	21

**B.4.7. Form work in lifts for continuous surfaces:**

Where forms for continuous surface are placed in successive units, (as for example in columns or walls) the forms shall fit tightly over the completed surface so as to prevent any leakage of water/mortar from the concrete and to maintain accurate alignment of the surface.

**B.4.8. Procedure while removing the form work:**

All formwork shall be removed without shock or vibration, as otherwise it would damage the reinforced concrete. Before the soffit and struts are removed, the concrete surface shall be first exposed partly, where necessary, in order to ascertain that the concrete has sufficiently hardened. Proper precautions shall be taken to allow for the decrease in the rate of hardening that occur with cement, in

cold weather. Wetting the surface before stripping is preferable, to avoid spalling of corners.

B.4.9. In case of structures with two or more floors, the weight of concrete, centering and shuttering of any upper floor being cast shall be suitably supported on one floor below the top most floor already cast. The rate quoted for reinforced concrete items is deemed to have included for these arrangements/supports.

B.4.10. **Tolerance:**

- a. All RCC work shall be executed to true lines and levels and plumb and to the final approval of Architect & Employer's representative.
- b. If work is not carried out within the reasonable tolerance the cost of all rectification measures of dismantling and reconstructing or as decided by the architect and Employer shall be borne by the Contractor. In case of work dismantled, the same will not be measured and paid for.

B.5.1. **Concrete mix proportioning:**

Concrete mix proportioning for all grades of concrete shall be as per IS 456 – 2000 clauses 8 & 9 and as per SP 23 – 1982 Section 6. The constituent materials to be used for concrete making namely cement, aggregates & water shall be as per clause 4 of IS 456 – 2000. The mix proportions shall be so selected as to ensure that the workability of the fresh concrete is appropriate/suitable for the conditions of handling and placing, so that after compaction its surrounds all reinforcements and completely fills the form work. When concrete is hardened, it shall have the required strength, durability and surface finish. The determination of the proportions of Cement, Aggregates and water to attain the required strengths shall be made as follows:

- a. By adopting nominal concrete mix, which is called 'nominal mix concrete'.

**Batching:**

In proportioning concrete the quantity of both cement and aggregate should be determined by mass. The mass of cement can be determined on the basis of mass of cement per bag. Water shall be measured by volume in calibrated containers/tanks or weighed.

In case of design mix of concrete, uniformity of the materials used for the concrete making has been established over a period of time, the proportioning may be done subsequently by volume batching, provided prior approval of Architect & Employer is obtained for same and ensured that periodic checks are made on mass/volume relationships of materials. Where weigh batching is adopted, allowance shall be made for bulking in accordance with IS 2386 (part III) 1963.

The concrete shall be mixed in a Mechanical Mixer as per IS 4791 – 1968. Workability of the concrete should be controlled by direct measurement of water content. Workability should be checked at frequent intervals as per IS 1199 – 1959. The contractor is entirely responsible for the proportioning of concrete mixes of required strengths and must submit the procedure for such

proportioning of concrete mixes for the prior approval of Employer & Architect, whose decision shall be final in the matter.

- b. Alternatively, contractor may use suitable ready mix concrete at no extra cost and after obtaining written permission from Architects/Air India Ltd..

**B.5.2. Transporting and placing concrete:**

- B.5.2.1. Immediately prior to placing the concrete, the shuttering shall be well watered and any water and rubbish lying removed.
- B.5.2.2. The concrete shall be transported from mixer to the position of placing as rapidly as possible and in a manner that would prevent separation or bleeding or impair the quality of concrete. Equipment for transportation, pumping or pneumatically conveying concrete shall be of such size and design as to ensure a practically continuous flow of concrete at the delivery end, and without any separation of the materials. The chute shall be of metal or metal-lined wood with slopes neither less than 1 vertical to 3 horizontal nor more than 1:2. The discharge end of the chute shall be provided with baffle plates to prevent segregation.
- B.5.2.3. Concrete shall not be dropped from a height in a manner, which will cause segregation. It shall be placed directly in its permanent position to avoid segregation due to rehandling. Rate of placing concrete shall be such as to avoid formation of planes of weakness in concrete being placed. No partly set or retempered concrete shall be used on the job.
- B.5.2.4. Each layer of concrete being placed shall be consolidated by mechanical vibration supplemented by hand spreading, rodding and tamping as directed, to form dense concrete with all surfaces free from honeycombing and tolerably free from water and air holes or other blemishes. Vibrators shall in no case be used to work along the forms. Duration of vibration shall be so limited to reduce time necessary for satisfactory consolidation, without causing objectionable segregation. The vibrator shall not be inserted into a lower course, that has already been vibrated/compacted and begun to set.
- B.5.2.5. The contractor shall be responsible for the co-ordination with sub-contractors or other contractors for incorporating necessary inserts, electrical conduit pipes, fixing boxes, blocks, chase holes, etc., as required. The contractor shall obtain approval from the Architect/Client as regards the above, before casting of the concrete. No holes or chases shall be made in the concrete, without prior approval of the Architect & Employer.
- B.5.2.6. Concrete shall be placed continuously until completion of the work.
- B.5.2.7. Accumulation of set concrete on the reinforcement shall be avoided. Before fresh concrete is deposited upon or against any concrete which has already hardened, the surface of the hardened concrete shall be well roughened, if necessary by chipping, and all luttance removed. The surface shall then be swept clean with wire brushes, thoroughly wetted and covered with a thin layer of rich cement mortar and or chemical additives, as may be directed by Architects.

- B.5.2.8. In foundation trenches or in like positions, concrete shall be carefully laid and poured from less than over 1 meter height. If the height exceeds 1 meter, the concrete must be deposited through inclined spouts. The trenches shall be maintained free of water during concreting by proper diversion of water flow with dewatering as required and directed, at no cost and without washing over freshly deposited concrete.
- B.5.2.9. Concrete footing shall be placed upon undisturbed clean and hard surfaces of specified bearing capacity.
- B.5.2.10. Contractor's authorised Engineers/Supervisors/Foremen shall always be present for all concreting work carried out at site.

**B.5.3. Protection of Concrete:**

Newly placed concrete shall be protected by approved means from rain, sun and drying winds. Exposed vertical/inclined/curved faces of concrete shall be kept wet continuously for not less than a fortnight by covering with a layer of sack curing, invariably horizontal surfaces shall be kept covered with water ponded by means of bunds. Concrete placed below the ground shall be protected from falling earth during and after placing. Approved means shall be taken to protect immature concrete from damage due to debris, excessive loading, vibration, abrasion, ground-water, mixing with earth or other materials, flotation and other influences that may impair the strength and durability of the concrete.

**B.5.4. Consistency:**

Only minimum and sufficient water shall be added to the cement and aggregate during the mixing to produce a concrete having sufficient workability to enable it to be well consolidated and to be worked into the corners of the shuttering and around reinforcement, to give the specified surface finish, and to have the specified strength. When suitable and appropriate amount of water has been determined, the resultant consistency shall be maintained through the corresponding parts of the work and approved tests shall be conducted from time to time to ensure the maintenance of this consistency.

The exact determination of the slump for various members and water cement ratio shall be as directed by the Architect & Employer.

Slumps tests shall be made in accordance with the details given in IS 456 – 1978.

**B.5.5. Finishing:**

- B.5.5.1. As soon as possible after the form work has been struck holes left by clamping bolts, air and water holes and other rough patches shall be filled in with cement and sand mortar 1:1 mix (sand passing 1/8" sieve) by working into the surface with a wooden float. Excess water shall be avoided. This should be done within 72 hours after removal of form work.
- B.5.5.2. Unless instructed to the contrary the face of exposed concrete placed against shuttering shall be rubbed down immediately upon removal of the shuttering to

remove fine or other irregularities. All surfaces which are required to be plastered shall be hacked properly.

B.5.5.3. All exposed faces of concrete members for which shuttering is not provided, shall be smoothed with a wooden float, when the concrete is green and setting has not started, to give a finish equal to that of rubbed down face where shuttering is provided. The top face of a slab, which is not intended to be covered with other materials, shall be levelled and floated while unset to a smooth finish to the levels of falls/slopes shown on the drawings or as instructed. The floating shall be done so as not to bring an excess of mortar to the surface of the concrete. Dentations in the surface of the concrete shall be formed, if specified/ordered, by approved implements to the depths and patterns described. The top face of a slab intended to be surfaces with mortar, granolithic or any other materials shall be finished rough (to receive final finish) and to the approval of the Architect & Employer.

**B.5.5.4 Honey Combing:**

- i) Where honey combed surfaces are noticed in the concrete, the contractor shall not patch up the same, until examined by the Architect & Employer and decision given regarding accepting the work with rectifications or rejections of the same. If the contractor patches up such defects without the knowledge of the Architect & Employer, the Architect & Employer will be at liberty to order demolition of the concerned concrete members to the extent they consider necessary. In such cases, the contractor shall reconstruct the demolished work. The cost of demolition and demolished work and disposal of debris shall not be measured and paid for.
- ii) If in the opinion of the Architect & Employer the honey combing is harmful to the structure and where so directed by the Architect & Employer, the full structural members affected by honey combing, as decided by Architect & Employer, shall be dismantled and reconstructed to Architect & Employer's approval. The cost of demolished concrete and as well cost of demolishing and disposing the debris will not be measured and paid for.
- iii) Where in the opinion of the Architect & Employer the structural members containing honey combing can be allowed to be retained with rectification, the rectification shall be carried out as directed by the Architect & Employer by gunniting (with cement mortar 1:3 proportion) or epoxy bonding and plastering the areas concerned at the contractor's expense.
- iv) If such honey combed areas are not severe in the opinion of the Architect & Employer and where so directed shall be patched up with dry-pack cement mortar consisting of 1 part of cement and 3 parts of sand after removing defective concrete down to sound concrete to the satisfaction of Architect & Employer all at the expense of the contractor. Such works should be completed within 72 hours from deshuttering.
- v) Concrete faces to be finally concealed shall be left as from the shuttering, except that honey combed surface shall be treated as above (i), (ii), (iii) & (iv).

Faces of concrete that are to have finished other than specified shall be prepared in an approved manner and as instructed.

- vi) The patched up areas shall be kept moist for 7 days and prevented from drying out too soon. Wherever required or instructed by the Architect & Employer, patching work shall be done using part white cement upto 30% of the total quantity of cement specified.

**B.5.6. Construction joints:**

Concreting shall be carried out continuously upto construction joints, if any, the position and details of which shall be predetermined by the Architects/Employers. Construction joints shall be provided as directed by the Architect. They shall be rebated and or of an approved shape for slabs, beams etc., and shall be provided in the positions described on the drawings or as directed by the Architects/Employer. Inclined “Feather” joints shall not be permitted. Shear keys not less than 2” deep and equal to 50% of the cross sectional area shall be provided to all construction joints. Reinforcing bars shall extend by not less than 60 time dia of respective bars for M:150, 50 times dia, for M:200, beyond construction joints, unless otherwise indicated.

The joints shall be kept only at places, where the shear force is minimum and these shall be at right angles to the direction of main reinforcement. In case of columns, the joints shall be horizontal and about 3” below the bottom of the deepest beam framing into the columns.

**B.5.7. Structural joints:**

Expansion joints, construction joints, hinges or other permanent structural joints shall be provided in the position and of the form described in the drawings or as directed by the Architects/Employers and shall be got approved before casting.

In no case shall the reinforcement corner protecting angles or other fixed metal items, embedded in or bonded into concrete, run continuously through the expansion joints. The placing of concrete on either side of the expansion joint shall be separated by suitable filler materials during continuous construction or alternately adequate space left during construction and filler materials placed in position later after an interval of atleast seven days.

**B.5.8. Cutting into concrete:**

No concrete shall be neither cut into, nor shall it be interfered with in any way, without the prior approval in writing by the Architect & Employer.

- B.5.9. No portion of the structure shall be subjected to any loading in excess of design loads, except with prior written permission of Architect.

**B.6.0. Strength of Concrete:**

- B.6.1. The concrete mix shall be so made to produce the desired grade concrete having the required workability and characteristic strength not less than values given below:

<b>Grade Definition</b>	<b>Specified Minimum Characteristic compressive strength at 28 days</b>
M – 15	150 Kg/Sq.cm
M – 20	200 Kg/Sq.cm
M – 25	250 Kg/Sq.cm
M – 30	300 Kg/Sq.cm

Strength of concrete required for various situations have been clearly stipulated in the relevant item of the schedule of quantities and/or in the drawings. As required by the Architect, the water content and the water/cement ratio shall be determined from the results of tests of the materials proposed for use, in advance of construction. It is important to maintain constant water cement ratio at its correct value.

If the concrete produced at site does not satisfy the above strength requirements, the Architect & Employer will reserve the right to require the contractor to improve the method of batching, the quality of the ingredients and the mix with increased cement contents, if necessary. The contractor shall not be entitled to claim any extra cost for the extra cement used or for the modifications, for fulfilling the strength requirements as specified. The able guide for the quality and for durability of concrete. It must also have an adequate cement content and as well a low water – cement ration, as given below, which is applicable for moderate weather conditions, as specified in I.S. 456 – 2000.

<b>MINIMUM CEMENT CONTENT</b>	<b>MAXIMUM WATER – CEMENT RATIO</b>
Moderate conditions 290 Kg/Cum	0.55

The minimum cement contents is based on 20mm aggregates. For 40mm aggregate it should be reduced by about 10% and for 12.5mm aggregate it should be increased by about 10%.

**B.6.2. Strength tests during the work:**

Samples should be taken from each 20 cum of concrete made during the progress of the work, or when a day's concrete work does not amount to 20 cum, then from each day's quota, and as required by Architects/Employers. Six samples of cubes of size 150 x 150 x 150mm shall be taken jointly each time in steel moulds, 3 of which shall be tested for 7 days strength and the remaining 3 shall be tested for 28 days strength on 7<sup>th</sup> and 28<sup>th</sup> day respectively, after the day of casting. Proper curing arrangements, as directed by Employers/Architects, shall be made at site by the contractor. Each cube shall be marked and numbered, and dated by the contractor.



The contractor shall maintain a register at site as directed by the Architect Employer, showing all particulars (date of casting, mix of concrete, location of concreting, water cement ratios, approximate concrete quantity represented by samples, no of cubes cast, date and results of testing, and remarks) and all the entries should be signed jointly by the contractor with Architect & Employer. 7 days strength shall not be less than 2/3rds of the 28 days strength. The results of the tests in any of the recognised laboratories and/or contractor's laboratory at site shall be taken as final and binding on the contractor. The average strength shall be higher than the prescribed strength. The average strength of the specimens taken at a time, may be assumed as the compressive strength of concrete, provided the difference between the maximum and minimum strength of the three specimens does not exceed 15% of the average strength. Concrete test cubes shall be taken out and got tested as per time schedule for knowing 7 days and 28 days crushing strength, at no extra cost, either at site or at an approved laboratory. Whenever for any set of cubes, if the 7 days crushing strength is found satisfactory, 28 days tests are not necessary. In cases, where 7 days strength is not satisfactory, tests for 28 days strength must be gone done WITHOUT ANY EXCEPTION.

In case the compressive strength obtained from the test samples of concrete at 28 days is less than the minimum specified characteristic compressive strength, the work is liable to be rejected at the sole discretion of Architect & Employer.

Employer's & Architect's decision regarding dismantling of such works or suitable rectifications or any alternative assessment by load test for allowing the corresponding work to be retained, shall be final and binding on the contractor. These shall be carried out at contractor's cost only. The condition of any test does not guarantee acceptance of concrete covered by the test final decision

regarding finally accepting/rejecting such works even after conducting those tests shall be made by the Architect & Employer only.

In case of concrete showing test results lower than the specified strength and in the opinion of the Architect & Employer such works could be allowed to remain, after due and satisfactory rectifications, if any, ordered and or load tests or even otherwise, then the rates quoted by the contractor, corresponding to those items, shall be reduced suitably for paying for that part of work. The Employer/Architect shall have full power in their absolute discretion to fix the actual rate payable after deduction, and it shall be binding on the contractor.

If the strength is so low that in the opinion of Architect & Employer, the work has to be dismantled, then the contractor shall do so as directed at his own cost irrespective of the amount of loss, inconvenience and difficulties involved. Rejected/dismantled work shall not be paid for.

If in the opinion of the Architect & Employer/Engineer any load test or hammer test or any other test is necessary, the same shall be carried out by the contractor as directed and he shall bear the cost of the same. Based on the results of the tests, the Architect shall reduce rates/accept after rectification or modification/reject and order dismantling of concrete, and the decision shall be final and binding on the contractor.

The contractor shall pay all costs incurred in supplying the material for and in making, maturing, delivering and testing the cubes.

**B.7. RECORD OF CONCRETING:**

B.7.1 The contractor shall keep a daily record showing the date when each portion of concrete is poured in slab, beam, column footing etc., curing period, removal of formwork and test cubes results at 7 days and 28 days period and observations on the same.

B.8. The rates for concrete shall also include, apart from any other factors specified elsewhere in the tender, as follows:

B.8.1. All materials required for design/ nominal mix concrete, getting the designs for the design mix from an approved agency, labour, use of tools and plants, scaffolding, mixing, conveying, placing, ramming, vibrating, formwork, finishing, curing, hacking etc., complete as required and directed.

B.8.2. Rates for concrete items shall cover

- a. Any shape and size, and for doing at any height and depth (all lifts) as per drawings, providing cover blocks or nylon spacers etc.
- b. Fixing all inserts such as pipes, plugs, forming holes/pockets etc.
- c. Providing dowel bars, etc., through shuttering and forming drip moulds to chajjas, sills etc., or at any other places as directed.

**B.9.0 MODE OF MEASUREMENT:**

B.9.1. Length of columns will be measured upto top of the slab.

B.9.2. Length of main beams will be measured between columns and depth below the top of the slab. For secondary beams length will be between main beams.

B.9.3. Slabs to be measured in Cum between beam to beam.

B.9.4. Chajjas will be measured in Sqm. Width to be measured beyond lintel width.

B.9.5. For staircase, RCC steps, waist slab, beams will be measured in Cum.

**B.10. PRECAST CONCRETE:**

B.10.1. All provisions in the specifications for concrete shall apply to precast concrete except for the specific variations given herein below:

**B.10.2. Aggregate:**

For maximum size of aggregate shall not be larger than one third of the minimum dimension of the member.

**B.10.3. Concrete Cover:**

For all surfaces not exposed to weather, all reinforcement shall be protected by concrete equal to the nominal diameter of bars but not less than 15mm.

**B.10.3. Concrete Cover:**

For all surfaces not exposed to weather, all reinforcement shall be protected by concrete equal to the nominal diameter of bars but not less than 15mm.

**B.10.4. Care:**

The concrete in one precast piece shall be placed in one operation. No piece shall be removed from the mould or erected until sufficiently natured to ensure that no damage may occur to the piece.

**B.10.5. Details:**

All details of jointing, inserts, anchors and bearing widths etc., shall be as shown in the drawings.

**B.10.6. Identification and Marking:**

All precast concrete members shall be properly marked to indicate the top of the member and its location.

**B.10.7 Transportation, Storage and Erection:**

While handling, including loading/unloading, the members shall be supported/hung at such suitable points, so that the member may safely withstand all the loads/stresses etc., that may occur/develop. For this, suitable hooks/markings etc., shall be provided, while casting itself, as may be necessary and or as directed.

B.10.7.1. Units shall be stored, transported and placed so that they will not be over stressed/pressed or damaged.

B.10.7.2. Precast concrete units shall be adequately braced and supported during erection to ensure proper alignment and safety and such bracing and supports shall be maintained until there are adequate permanent connections.

**E. CEMENT PLASTERING/CEMENT POINTING:**

**E.1.0. MATERIALS:**

E.1.1. Cement, sand and water constituting the materials for the work shall conform to the specifications laid down for the concrete work. Fine sand shall be used as per IS Code.

E.1.2. Lime required for neeru finish shall be of approved variety fat lime.

E.1.3. Mortar shall be in proportions specified in the bills of quantities.

**E.2.0. WORKMANSHIP:**

E.2.1. **General:**

- E.2.1.1. Adequate single scaffolding (if specifically permitted) shall be provided by the contractor at his expense and the scaffolding holes shall be filled in with cement concrete 1:3:6 (1 cement : 3 coarse sand: 6 hard graded stone aggregate 20mm size) compacted well and plastered over before lowering the scaffolding just below, if any, without any extra cost. In case double scaffolding is done, nothing extra shall be paid.
- E.2.1.1. Dewatering the foundation if required, shall be done by the contractor at his own cost.
- E.2.1.2. The surfaces to be plastered shall be first cleaned and watered well in advance and thoroughly wetted before plastering.
- E.2.1.3. Smooth surfaces of concrete, old plaster etc., shall be suitably roughened or removed to provide necessary bond for the plaster. All dirt, spots, oil paint etc., which prevents proper bond with plaster, shall be removed.
- E.2.1.4. Patches of plaster 150 x 150mm shall be put on about 3 meter apart as gauges, to ensure even plastering in one plane.
- E.2.1.5. All plaster work will be done to lines levels and plumb and to the satisfaction of Architect & Employer.
- E.2.1.6. For walls, columns and beams, thickness will be minimum 20mm for external faces and 15mm thick for internal faces, while for ceiling it shall be average 10mm, unless otherwise specified in bill of quantities.
- E.2.1.7. The thickness specified shall be average and measured from the proudest part of the surface.
- E.2.1.8. Unless otherwise stated in Bill of Quantities, cement mortar shall be in 1:4 (1 cement :4 fine sand) proportion.

E.3.0. **CEMENT POINTING:**

E.3.1. **Materials:**

- E.3.1.1. Cement, sand and water shall conform to the specifications laid down for the concrete work, fine sand to be used as per ISI code.

E.3.2. **Workmanship:**

- E.3.2.1. Dust and mortar powder shall be brushed out of all joints. The surface shall then be washed with water and kept wet before pointing is commenced.
- E.3.2.2. In case of dry rubble pitching, the cement mortar 1:4 (1 cement : 4 sand) proportion shall be well pressed into the joints with a pointed trowel and rubbed smooth. It shall not be spread over the corners, edges and face of the masonry. All superfluous mortar, if any, shall be removed, with a trowel. All joints shall be generally uniform in size.

E.3.2.3. The pointing shall be kept wet for atleast ten days. It shall be suitably protected from sun, rain and other factors during the period of curing.

E.4. **Mode of Measurement:**

Pointing work shall be measured in Sq.meters. Deductions for openings exceeding 0.5 sq.m. will be made, same as for plaster.

F. **FLOORING:**

F.5. **GRANITE FLOORING SKIRTING AND FACING:**

F.5.1. **Materials:**

F.5.1.1. Granite stone slabs shall of the thickness and type mentioned in the item and of the colour and quality approved by the Architects. Slabs shall be hard, dense, uniform and homogeneous in texture. They shall have even crystallized grain and be free from defects and cracks. The surface shall be mirror polished to an even and perfectly plain surface and edge machine cut, true and square.

F.5.1.2. No slab shall be thinner than the specified thickness, at its thinnest part. The dimensions of the slab shall be as specified in the item. A few specimens of approved finished slabs shall be deposited by the Contractor in the Architect's office for reference.

F.5.1.3. All the Granite slabs brought to site shall be got approved by the Architect & Employer, before using them in the work. Sizes of Granite slabs for floorings, steps/raisers and dado etc., shall be got approved by Architect & Employer, before ordering for the same.

F.5.2. **Workmanship:**

F.5.2.1 They shall be laid to the pattern shown in the drawings or as directed by the Architects.

F.5.2.2. The surface on which the Granite slabs are to be laid shall be cleaned of all dust and saturated with water.

F.5.2.3. The Granite slabs shall be set in cement slurry over cement mortar bedding as specified and tamped with wooden mallet. The joints shall not exceed 1mm. In thickness and shall be grouted/flushed with white cement mixed with pigment of suitable colour, if required, to match the shade/colour of slabs, and cured for 10 days.

F.6. **GLAZED TILE IN FLOORS, DADOS & SKIRTING:**

F.6.1. **Materials:**

F.6.1.1. glazed tiles shall be of first quality and of approved make and 5.5 mm in thickness. They shall be sound, hard and well and evenly glazed with fine and sharp edges, and free from twists. The rear face shall be grooved and recessed or suitably moulded, in parts, to provide necessary cessed or suitably moulded, in parts, to provide necessary key for mortar. They shall generally conform to

I.S.777:1988 (Second revision). The tiles shall be of sizes 150mm x 150mm or 100mm x 100mm or as specified/directed.

F.6.2. **Workmanship:**

F.6.2.1. The tiles to be used for floor and dado shall be of the same manufacture and of first quality, as per approved sample.

F.6.2.2. Tiles shall be immersed in water for atleast 6 hours prior to their end use.

F.6.2.3. Cement sand mortar 1:4 (1 cement :4 coarse sand) bed (average 20mm thick for flooring and 12mm thick for skirting finished to proper levels and falls. After the surface has hardened sufficiently, it shall be roughened, cleaned and well set to receive a thin cement slurry of honey like consistency. Tiles with their under side also smeared with cement slurry of honey like consistency shall then be laid over the bedding and tamped into position properly to have the top surfaces in a true plane and level or to falls as directed.

F.6.2.4. For skirting/dado, the surfaces shall be plastered with cement mortar 1:4 (1 cement : 4 coarse sand) to make the surface even and in plumb. The surface of the plaster shall be scarified with brush for getting a good bond between the back of the tiles shall be battered with cement paste and pressed on the plastered surface as per flooring and tapped in position.

F.6.2.5. Joints shall be thin, uniform, even and straight. The joints shall be cleaned off gray cement and pointed with white cement paste with pigment, if required, to match the shade of the tiles. The work shall be cured for 7 days. After curing, the surface shall be washed clean with water and oxalic acid. The finished floor skirting/dadoo shall not sound hollow, when tapped with a wooden mallet.

F.6.3. **MODE OF MEASUREMENT:**

All flooring work will be measured in Sq.metre basis and shall be measured between unplastered wall surfaces. Skirting and dado will be measured in Sq.meters and the height above flooring will be measured, length between the finishes of adjoining walls, if any.

F.7. The ceramic flooring shall be of first quality and of approved make and 7.5mm in thickness. They shall be sound, hard and tough as per manufacturers specification. The rear face shall be groove and recessed or) suitably manholed in part to provide necessary key for mortar. The tiles shall be of sizes 12" x 12", 8" x 8" (or) as specified/directed.

G. **GLASS:**

G.1.1. All glass used in the doors, windows and ventilators etc. shall be of the best quality, free from specks, bubbles, smoke, veins, airholes, blisters and other defects. The kind of glass and its thickness shall be as mentioned in the item or a shown in detailed drawings or as ordered by the Architect. The glass shall generally confirm to I.S.1765.

- G.1.2. Sheet glass shall be best quality of approved make plain/ground/frosted, and either 4mm or 5.0mm thick, as specified. For Bath/W.C. windows 3.8 to 4mm thick frosted glass shall have to be used as directed.
- G.1.3. Plate glass shall be polished patent plate glass of best quality. It shall have both surfaces flat and parallel and polished to give clean undistorted vision. All mirrors shall be of plate glass and give clear undistorted reflection. The thickness of the glass shall be as mentioned in the item or shown in the detailed drawings or as directed by the Architect. Minimum thickness of plate glass shall be 4mm to 5.5mm.
- G.1.4. Float glass, wherever specified shall be “Bronze tinted” manufactured by FLOAT GLASS INDIA LIMITED to thickness as specified.

G.1.5. **Obscured or ground glass:**

This glass transmits lights, but the vision is partially or almost completely obscured. Principal types are plain, rolled, double rolled, figured, ribbed, fluted, frosted (on one or both sides) and rough cast. The thickness shall be as specified in the item or as mentioned in the drawings or as directed by the Architect.

G.2. **MODE OF MEASUREMENT FOR DOORS AND WINDOWS:**

Payment will be made for the area of opening in the masonry as per relevant ISI. The height of the door shall be measured from finished floor level to the bottom of lintel on the top.

I.2.2. **Rate:**

For purposes of payment, treatment described above shall be measured over flat areas of floors etc. Vertical areas treated shall not be measured for purposes of payments. Cost of same is included in the rate quoted for flat area.

I.3. Main Building contractor shall get all water proofing work (including and sunkel areas) shall be done from any of the approved agencies for this water proofing. The contractors shall obtain a guarantee for a period of 10 years for all the water proofing treatments from that approved water proofing contractor, and shall be jointly responsible for any defects noticed in the work during the above period of execution and defect liquidation liability period. Rate quoted shall include the same.

I.4. All waterproofing work shall be guaranteed for ten years in approved proforma acceptable to the Employer, on a stamp paper of required denomination. This guarantee will be given by approved waterproofing contractor directly to STATE BANK OF INDIA as soon as the work is virtually completed and before the final bill is settled.

I.5. Although the waterproofing work is guaranteed by the approved waterproofing contractor for ten years, the main building contractor shall be responsible, if at any time during the defects liquidation liability period, the other surfaces of areas treated for waterproofing (ceiling etc) show leaks, wet patches, dampness or the waterproofing deteriorates/shows signs of distress/ give way either due to the inadequacy of the work carried out or materials/ workmanship etc., used or

for any other reason whatsoever, and shall be liable without any extra cost and inconvenience to the Employer or the occupants, to carry out the necessary rectifications/remedial measures, including redoing of work, as and when required, during defects liquidation liability period, to make good the deficiencies.

**J. PAINING/POLISHING WORK:**

**J.1 LIME WASHING AND COLOUR WASHING:**

J.1.1. The materials for preparing the lime wash shall be freshly burnt fat lime of good quality free from unburnt stone and other foreign matter.

This shall be dissolved in sufficient quantity of water (about 4-5 litres/Kg of lime), stirred thoroughly and strained through a clean coarse cloth. Alternately, ready made whiting, complying with I.S.63-1950, may also be used. Clean gum dissolved in hot water shall then be added in suitable proportion of 2 gm. of gum-arabic to a litre of lime, to prevent lime wash coming off easily when rubbed.

J.1.2. Colour wash shall be lime wash prepared as above, to which a solution of water, lime and fast pigment, boiled if directed, shall be gradually added and stirred until the required shade/tinge is obtained.

J.1.3. As required, single or double scaffolding or ladder shall be used, without damaging or scratching the wall/plastered surfaces/floors.

J.1.4. The surfaces to be painted shall be prepared by removing all mortar droppings and foreign matter and thoroughly cleaned with wire or fibre brush. All holes or depressions shall be stopped with mortar and cured and surfaces made even and smooth before painting.

J.1.5. Colour/lime wash shall be applied with a brush. The first stroke of brush shall be from top downwards, next from bottom upwards over the first stroke and further a stroke over the earlier brushing before it dries. This will form one coat. Each coat must be allowed to dry and shall be subject to inspection before the next coat is applied. When dry, the surface shall not show signs of cracking and shall present a smooth and uniform finish, free from brush marks, and it shall not come off easily, when rubbed with a finger. Patchy or streaky work will be rejected and shall have to be re-executed at the contractor's own expense. Unless otherwise specified, 3 coats of lime wash or colour wash shall be applied.

J.1.6. Doors, windows, floors and other articles of furniture etc., shall be protected from being splashed upon. Splashing and droppings, if any, shall be removed and surfaces cleaned.

**J.2. CEMENT WASH:**

**J.3.1. Dry Distempering:**

**J.3.1.1. Material:**



Powdered dry distemper shall be of approved make, colour and shade and manufactured by approved manufacturers. It shall generally conform to IS:427 – 1965.

**J.3.1.2. Scaffolding:**

This shall be double or single as required and directed.

**J.3.1.3. Preparing the surface:**

The surface to be distempered shall be cleaned well and all cracks, holes and surface defects shall be repaired with gypsum and allowed to set hard. All irregularities shall be sand papered smooth and wiped clean. The surface so prepared must be completely dry and free from dust before distemping is commenced. In the case of newly plastered walls, special care shall be taken to see that it is completely dry before any treatment is attempted. For old surfaces, which has earlier been distempered, the surface shall be cleaned well of grease, dust etc. The flaking of previous coating, if any, shall be removed/ taken off.

All cracks, holes and surface defects shall be repaired with gypsum and allowed to set hard and then sand papered and wiped clean. But in case the surfaces were colour or white washed, the wash must be removed thoroughly first.

**J.3.1.4. Priming Coat:**

The priming coat shall be applied over complete dry surface in the manner recommended by the manufacturer in case of patent distemper. When no priming coat is specified by the manufacturer, finely powdered chalk mixed with a thin solution of glue shall be applied to prepare a good hard background. This coating, when dry, shall be sand papered as close and smooth as possible.

**J.3.1.5. Application of Distemper:**

The instructions of the manufacturer shall be followed, regarding the preparation of the surface and application of priming and finishing coats. Distemper shall not be mixed in quantities larger than is actually required for a day's work. Hot water may be used to prepare the mixture. Distempers shall be applied in dry weather with broad stiff brushes in long parallel strokes. The treated surface shall be allowed to dry and harden. Second or succeeding coats shall not be applied until the preceding coat has passed by the Employer & Architects. Two more coats of distemper shall be given in exactly the same manner as the first one but only after the earlier coat laid has thoroughly dried. All the operations (strokes of brush) for one coat of white/colour wash will give two coats in case of distemping.

**J.3.1.6. Rates to be inclusive of:**

The rates shall include all labour, materials, equipment and tools for carrying out the following operations:

- i) Providing and mixing the primer and distemper separately.
- ii) Scaffolding.

- iii) Preparing the surface to receive the priming and finishing coats.
- iv) Applying the priming coats.
- vi) Each coat to be completed in all parts of one building and got approved, before starting next coat in that building, and shall not be done room wise or floor wise.
- vii) Applying the distemper in 3 coats minimum, including primer coat. If a proper even surface is not obtained to the satisfaction of the Employer & Architects in 3 coats contractor shall carryout additional coats of distemper to approval, at contractor's own expense.

**J.4. ACRYLIC WASHABLE DISTEMPER:**

- J.4.1. Washable acrylic distemper shall be conforming to IS 2395 – 1 – 1966 and shall be of approved make and shade.
- J.4.2. As required, single or double scaffolding shall be used. Ladders, if used, shall be tied with old gunny bags at top to prevent damage or scratches to the walls/floors etc.
- J.4.3. The instructions of the manufacturer shall be followed regarding preparation of the manufacturer shall be followed regarding preparation of the surface and application of priming and finishing coats.
- J.4.4. Where the specifications of the manufacturer are not available, the following instructions shall be carried out:
- J.4.5. The surface shall be cleaned and all clears, holes and surface defects shall be repaired with gypsum and allowed to set hard. All irregularities shall be sand papered smooth and wiped clean. The surface so prepared shall be completely dry and free from dust before distempering is commenced. In case of newly plastered surfaces/walls, special care shall be taken to see that it is completely dry before treatment is attempted.  
  
The old surfaces which had earlier been distempered, shall be cleaned of grease and dust etc. All cracks, holes and surface defects shall be repaired with plaster of Paris and allowed to set hard and then sand papered smooth and wiped clean. The flakings of previous coatings, if any, shall be taken off. But in case the surfaces are colour or white washed, the wash must be removed thoroughly first.
- J.4.6. The priming coat shall be applied over complete dry surfaces as recommended by the manufacturers or patent distemper.
- J.4.7. Distemper shall be applied in dry weather with a broad stiff brush in long parallel strokes. This shall be allowed to dry thoroughly before the next coat is applied. All the operations (strokes of brush) for one coat of white colour wash will give tow coats in case of distempering.

Rates to be inclusive of: The rates shall include all labour, materials, equipment and tools for carrying out the following operations:

- i) Providing and mixing the primer and distemper separately.
- ii) Scaffolding.
- iii) Preparing the surface to receive the priming and finishing coats.
- iv) Applying the priming coats.
- v) Each coat to be completed in all parts of one building and got approved, before starting next coat in that building, and shall not be done room wise or floor wise.
- vi) Applying the distemper in 3 coats minimum, including priming coat. If a proper even surface is not obtained to the satisfaction of the Employer and Architects in 3 coats contractor shall carryout additional coats of distemper to approval, at contractor's own expense.

**J.5. WATERPROOF CEMENT PAINT:**

The waterproof cement paint shall be of Super Snowcem or of any approved manufacture and it shall be of approved colour and shade. It shall be brought to site in original air tight containers with seals intact.

Double scaffolding and ladders shall be provided, if necessary, without damaging the wall surfaces to be painted.

The preparation of surface, mixing of paint and application shall be done as specified by the manufacturer. In the absence of manufacturer's specifications, the following shall be followed:

The surfaces shall be thoroughly cleaned free from dirt, dust, etc., by brushing and washing down with clean water. Any grease, oil paint or other foreign material shall be removed by approved method.

Colour/Lime wash and or distemper shall be thoroughly removed by washing, brushing and if necessary the accumulated coats of oil paint shall be removed by thoroughly brushing or scraping and washing and a clean even surface obtained.

Rough cast plaster and pebble dash surfaces shall be thoroughly brushed and washed to remove dust and dirt.

Dry cement paint shall be thoroughly mixed with clean fresh water to produce paint of required consistency. It shall be strained through a paint strainer. The paint shall be kept stirred thoroughly and applied within the specified time. Hardened or damaged paint shall not be used.

The paint shall be applied by brush. Each paint coat shall be properly cured and got inspected and approved by the Architects/Employer before the next coat is applied. Minimum 2 coats will be applied but if the work is not satisfactory, more coat/coats shall be applied as directed at no extra cost.

Absorbent surfaces shall be evenly damped so as to give even suction in dry weather, freshly painted surfaces shall be kept damp for atleast two days.

For smooth surfaces one coat of primer shall be applied as per manufacturer's specifications and three more coats of cement paint of approved shade shall be applied. All operations (strokes of brush) for one coat of white (colour wash will give two coats of cement painting).

Rates to be inclusive of: The rates shall include all labour, materials, equipment and tools for carrying out the following operations:

- i) Providing and mixing the primer and waterproof cement paint distemper separately.
- ii) Scaffolding.
- iii) Preparing the surface to receive the priming and finishing coats.
- iv) Applying the priming coats.
- v) Each coat to be completed in all parts of one building and got approved, before starting next coat in that building, and shall not be done room wise or floor wise.
- vi) Applying the waterproof cement paint in 3 coats minimum, including primer coat. If a proper even surface is not obtained to the satisfaction of the Employer & Architect in 3 coats, contractor shall carryout additional coats of work to approval, at contractor's own expense.

vii) **Water repellent silicon liquid paint:**

Multipurpose protective coating.

PIDICOTEW – 100 is a protective coating system designed for vertical walls, and acts as a one-way membrane, allowing moisture to escape to the surface but prevents moisture ingress into the treated structure.

**Application Areas:**

- External wall surface for durable insulation effect.
- For wall surfaces, can be used as protective coating in the desired colour.
- For protecting industrial as well as residential structures from weathering effect.

**Coverage:**

- 10 to 12 Sq-m/lit of PIDEBIND P – 100 on smooth surface once the area is covered properly with primer coat then, apply one coat of PIDICOTEW – 100 with a coverage rate of 5 sqm/lit.

- After 1 hour of drying of first coat, second coat of PIDICOTEW – 100 shall be applied with the coverage rate of 5 sqm/lit.

J.6. **MODE OF MEASUREMENT (FOR J1 TO J5):**

For all the above painting items, Mode of measurement shall be same as that of plastering and shall be in Sq.meters. No extra payment shall be made for painting rough cast surfaces or sandfaced surfaces.

J.7. **ENAMELLED PAINTING:**

J.7.1. **Materials:**

J.7.1.1. The paint shall be of the specified colour and shade and of an approved make by the Architect & Employer. The paint shall comply in all respects with relevant Indian Standard Codes.

J.7.1.2. The make and brand of the paint to be used on the work shall first be got approved by the Architects/Employer. The material shall be obtained directly from the approved manufacturers or authorised dealers and brought to the site in the manufacturers drums etc., with seals unbroken.

J.7.1.3. Paint for undercoating and finishing coat shall be ready mixed. Mixing by contractor is not permissible except with prior written approved of the Architects/Employer, in which case the preparations of ingredients and their quality shall be strictly maintained as per manufacturer's instructions and relevant I.S. codes.

J.7.1.4. All the materials shall be kept properly protected when not actually in use. Lids of containers shall be kept closed and surfaces of paint in open shall be covered with a thin layers of turpentine to prevent formation of a skin.

In case of doubt regarding the quality, the paint supplied by the contractor shall be got tested in an approved laboratory as described in I.S. 101 – 1964, if considered necessary by the Architect. The cost shall be borne by the client, if the results are satisfactory, and by the contractor if otherwise. The rejected paint shall be removed from the site of work forthwith.

J.7.2. **PREPARATION OF SURFACE:**

J.7.2.1. **Plastered Surfaces:**

New plaster shall not be primed or painted till it is completely dry and hard. The surface shall be carefully rubbed smooth and thoroughly cleaned. The surface shall be dry, smooth, clean and free from dirt.

J.7.2.2. **Steel work (NEW):**

Degreasing shall be done by either proprietary brands of approved solvent cleaner or by mineral turpentine or petroleum and other petroleum solvents, like trichloroethylene alkali solutions or detergents as directed by the architects.

The de-rusting shall be done by manual scraping (by wire brushes, fine steel wool scraper, sand paper etc.) and/or mechanically by sand blasting, shot blasting or flame cleaning or chemical methods as approved by the Architects.

**J.7.2.3. Steel work (Old):**

For repainting necessitated due to any specified reason the relevant instructions given in I.S. 1447:1966 shall be followed. If necessary and ordered by the Architect, the surface shall be cleaned completely as for new steel.

**J.7.2.4. Wood Work:**

The surface to be painted shall be thoroughly dry, clean and smooth. It shall be sand papered with coarse medium grade sand papers and the finished surface shall be free from scratches.

J.7.2.5. Before applying primer, knots, if any, shall be covered with preparation of red lead made by grinding red lead in water and mixing with glue sized and used hot. The surface prepared for painting shall be dry before paint is applied. The holes and indentation on the surface shall be stopped with putty. Stopping shall not be done before the priming coat is applied.

**J.7.3. Application:**

J.7.3.1. All brushes, tools, etc., used shall be cleaned of all foreign matter at the beginning of different operations being undertaken.

J.7.3.2. Paint may be applied by spraying or brushing. Unless otherwise specified, paint shall be applied with brushes. Brushes of appropriate size shall be either round or oval shaped and they shall be maintained carefully throughout the work so as to be pliable and free from bristles.

J.7.3.3. The contents of the drum and tins shall be well stirred with a small clean and smooth stick before using and occasionally during use to prevent sedimentation at the bottom of the container.

J.7.3.4. Painting shall be carried out as far as possible in dry and warm weather.

J.7.3.5. Single or double scaffolding shall be used as necessary, by the contractor at his cost. Ladders, if used, shall be tied with old gunny bags at top to prevent damage or scratches to the walls, floors etc.

J.7.3.6. The primer coat shall be applied as soon as the surface has been cleaned and before deterioration of surface by rust and contamination of the surfaces by dust, dirt or any other foreign material.

J.7.3.7. Sufficient time shall be allowed for each coat of paint to dry before the next is applied.

J.7.3.8. Painted surface, shall be protected from sun, rain, condensation, contamination or surface damage, till it is completely dry. 'Wet paint' shall be put, when necessary.

J.7.3.9. Preparation of surfaces, priming coat, undercoat and finishing coats shall be applied as specified or recommended by the manufacturer. Where no specifications are available, the following specifications will be followed.

J.7.3.10. **Primer Coat: Plastered surface:**

Priming coat shall consist of equal parts of white and red lead mixed in boiled linseed oil to the required consistency applied uniformly over the surface. When this coat is dry, all cracks, holes and other such defects shall be filled with a mixture of one part of white lead and 3 parts of ordinary putty. After drying, the surface shall be rubbed with sand paper and dusted clean. An undercoat shall be applied thinly so that plaster may be thoroughly saturated. One or more undercoats with putty shall be applied as required and directed to obtain thoroughly saturated surface to the satisfaction of Architect & Employer.

**Steel Work:**

The primer coat be of red lead conforming to I.S.102 – 1962. Undercoating and puttying shall be done, if necessary. For old painted surfaces and new surfaces already primer with red lead/red oxide, the surface shall be cleaned thoroughly and primed with red lead/ red oxide, at some places, where necessary or over the whole surface as directed by the Architects.

**Wood Work:**

The primer coat shall consist of red lead, white lead, raw and boiled linseed oil and patent driers.

After priming coat, all small holes, cracks, open joints and other minor defects shall be stopped with putty made from whitening mixed to proper consistency

with raw linseed oil and little white lead to help hardening of putty. The surface shall then be lightly rubbed down smooth with sand paper. One or more undercoats, with putty shall be applied as required and directed to obtain thoroughly saturated surface to the satisfaction of Architect & Employer.

J.7.3.11. **Finishing coats:**

Unless otherwise specified in the item, the finishing shall be done with at least two coats of paint of approved make and shade conforming to the latest I.S. codes. The last coat of paint shall give a matt/flat, semi-glossy or glossy finish as specified for each item of painting or as directed by the Architect & Employer. Striple finish shall be given at no extra cost, if required, by the Architect & Employer. The finished surface shall be of the required shade and present an even appearance. It shall not show any brush marks. If required, final coat will be applied with rollers at no extra cost.

J.8. **ENAMEL PAINT:**

General specifications, preparation of surface and priming coat shall be same as specified for oil painting. Finishing shall be done in two coats or more as

required with synthetic enamel paint of approved make and shade and shall generally conform to relevant I.S.codes.

**J.9. RATE FOR ALL PAINTING WORKS TO INCLUDE:**

Apart from other factors mentioned elsewhere in this contract, the rate for painting shall also include.

- J.9.1. Providing all the materials/labour and equipment that is required to execute the work as specified.
- J.9.2. Scaffolding (single/double) erection and removal.
- J.9.3. Preparing the surfaces before painting.
- J.9.4. Applying three coats of approved paint including priming coat. If proper & even surface or shade is not acquired, then extra cost/coats shall be applied as directed and to the final approval of the Architect & Employer, at no extra cost.
- J.9.5. Applying additional priming coat/coats to obtain thoroughly saturated surface and filling the putty as required and directed.
- J.9.6. No extra coat shall be paid for painting smooth/rough surfaces such as precast concrete pardis, rough cast plaster, sand faced plaster etc.
- J.9.7. Curing the cement paint as directed for minimum 7 days.
- J.9.8. Doors, windows, floors and other materials of furniture etc., shall be protected from being splashed upon. Splashing and droppings, if any, shall be removed and the surfaces cleaned as directed.
- J.9.9. If any cracks develop in the plaster, before or after final painting, the same will have to be filled in by suitable putty and the surface painted again as directed to give an even surface to the approval of Architect & Employer at no extra cost. If new surface is damaged due to any reason before painting, then the surface shall be redone by using plaster of paris as directed, at no extra cost.

**J.10. MODE OF MEASUREMENT FOR OIL, ENAMEL PAINT, POLISHING ETC:**

- J.10.1. Measurement of painted/polished surfaces shall be in Sq.m and as per plaster work.
- J.10.2. For measurement of polishing/painting to joinery and steel work etc., multiplying coefficients, as in standard table shall, be as follows:

S.NO.	DESCRIPTION OF WORK	HOW MEASURED	COEFFICIENT



I.	<b><u>Wood Work – doors and windows etc:</u></b>		
1.	Panelled doors/windows.	Measured flat including frame.	1.30 (for each side).
2.	Flush doors	- do -	1.20 (for each side).
3.	Partly panelled and partly glazed or glazed doors/windows (for glazed portions only – for panelled portions as per 1 above).	- do -	1.00 (for each side).
4.	Fully venetioned or louvered doors/windows.	- do -	1.80 (for each side).
II.	<b><u>Steel Work – Doors and Windows:</u></b>		
1.	Fully glazed doors & windows.	Measured flat including frame.	0.50 (for each side).
2.	Plain sheeted steel door, windows.	- do -	1.10 (for each side)
3.	Collapsible gate.	Measured flat.	1.50 (for painting all over)
4.	Rolling shutters of interlocked laths.	-do- jamb guides bottom rails, locking arrangement included (top cover shall be measured separately)	1.10 for each side.
III.	<b><u>General work:</u></b>		
1.	Expanded metal, M.S. grill work, grating in guard bars, ballustrades, railing and partitions.	Measured flat.	1(for painting all over).
	R.C.C. grill.	- do -	1(for each side).

The table given above is as per C.P.W.D. specification.

J.11. **FRENCH SPIRIT POLISHING:**

J.11.1. **Materials:**

French spirit polish shall be of an approved make conforming to I.S.348:1968 and shall be approved by the Architects. If it is to be prepared, the polish shall be made by dissolving 0.7 Kgs of best shellac in 4.5 litres of spirit or wine

without heating. To obtain required shade, approved pigment shall be added and mixed in required proportions.

J.11.2. **Workmanship:**

J.11.2.1. **Preparation of Surface:**

The surface shall be cleaned. All unevenness shall be rubbed down smooth with sand paper and well dusted. Holes and indentations of the surface shall be filled with putty made of whiting and linseed oil. The surface shall be given a coat of filler made of 2.25 Kg of whiting and 1.5 litre of methylated spirit. When it dries, the surface shall again be rubbed down perfectly smooth with sand paper and wiped clean.

J.11.2.2. **Application:**

A piece of clean fine cotton cloth or cotton wool made into the shape of a pad shall be used to apply polish. The pad shall be moistened with polish and applied sparingly but uniformly and completely over the entire surface. It shall be allowed to dry and then only another coat is applied in the same way. To finish off, the pad shall be covered with a fresh piece of clean fine cotton cloth, slightly damped with methylated spirit and rubbed lightly and quickly with a circular motion. The finished surface shall have a uniform texture and high gloss. Irrespective of number of coats, this will be carried out to the entire satisfaction of Architect & Employer.

J.12. **POLISHING:**

J.12.1. **Materials:**

This shall be of approved quality and make and brought to site in sealed containers as marketed by the manufacturers.

J.12.2. **Workmanship:**

J.12.2.1 **Preparation of Surface:**

Woodwork to be treated shall be finished smooth. It shall then be stopped and rubbed down perfectly smooth with different grades of sand paper. (The final rubbing shall be done with sand paper which has been slightly moistened with linseed oil and rubbed one over the other for a few seconds).

J.12.2.2. **Application:**

The mixture of the polishing shall be applied evenly, with a clean cloth pad in such a way that no blank patches are left, and rubbed continuously for half an hour. When the surface is quite dry, a second coat shall then be applied and rubbed for two hours or more if necessary, until the surface has assumed a uniform glass and is quite dry, showing no signs of stickiness when touched. Irrespective of number of coats, this will be carried out to the entire satisfaction of Architect & Employer.

J.13. **MEASUREMENT:**

Measurement for French/wax polishing and or polishing with ready made polish will be as per schedule stated herein before and the explanatory note on coefficient shall be as per C.P.W.D. specifications.

J.14. For all painting and polishing works (J.1. to J.12):

- (i) Detailed register shall be maintained, by the contractor, showing daily account of receipts, consumption and balance of different materials showing materials received and their consumption with location, and shall be checked by Employer & Architect as their discretion.
- (ii) Each coat of work shall be done in one building at a time and got approved before starting next coat in that building; and shall not be done room wise or floor wise.

K.15 **STRUCTURAL STEEL WORK:**

10.0 **Definitions**

**Bead:** A single runoff weld metal deposited on surface

**Butt weld:** A weld in which the weld metal lies subsequently within the extension of the planes are the surfaces of the parts jointed.

**Crater:** A depression left in weld metal where the arc was broken of the flame was removed

**End crater:** A crater of the end of a weld or at the end of a joint.

**Fillet Weld:** A weld of approximately triangular cross-section joining two surfaces approximately at right angles to each other in a lap joint, tee joint or corner joint it is of two types:

- 1) Continuous
- 2) Intermittent

**Fusion welding:** Any welding process in which the weld is made between metals in a state of fusion without hammering or pressure.

**Non-fusion welding:** A team applied to the deposition, by the Oxy-Acetylene flame is used make the surface to be united plastic, No filler metal is used.

**Run:** The metal deposited during one passage of the electrode or blow pipe in the making of a point throat thickness: See Fig.1

**Weld:** A union between two pieces of metal at faces rendered plastic or liquid by heat or pressure, or born, Filler metal may be used to effect the union.

10.1 **Materials**

10.1.1 **Steel:** All finished steel shall be well and cleanly rolled to the dimensions and

weight specified by BIS subject to permissible tolerances as per IS: 1852. The finished materials shall be reasonably free from cracks, surface flaws laminations, rough and imperfect edges and all other harmful defects.

Steel Sections, shall be free from excessive rust, scaling and pitting and shall be well protected. The decision of the Engineer-in-Charge regarding rejecting any steel section on account of any of the above defects shall be final and binding.

Structural steel work shall conform to the following requirements. The mechanical and chemical properties of the structural steel shall be as per Appendix A of Chapter 10. The following varieties of steel should be used for structural purposes:

- 10.1.1.1 S.T. 42-S: The standard quality steel designated as S.T. 42.S conforming to IS: 226 shall be used for all types of structure (riveted or bolted) including those subject to dynamic loading and where fatigue, wide fluctuation of stresses and reversal of stresses are involved, as for example crane gantry girders, road and rail bridges etc., it is also suitable for welded structures provided that the thickness of materials does not exceed 20mm.
- 10.1.1.2 S.T. 42-W : The fusion welding quality steel designated as S.T. 42 –W, conforming to IS: 2062 shall be used for structures subject to dynamic loading (Wind load is not to be considered as dynamic load for this purpose) where welding is employed for fabrication and where fatigue, wide fluctuation of, stresses reversal of stress and great restraint are involved as for example, crane gantry girders and road and rail bridges.
- 10.1.1.3 S.T. 42-0 : The ordinary quality steel designated as S.T. 42-0conforming to IS:1977 shall be used for structures not subjected to dynamic loading other than wind loads where welding is not employed or/and structures not situated in earth quake zones or/and design has not been based on plastic theory.
- 10.1.1.4 S.T.42-0: The ordinary quality steel designated as S.T. 32-0 conforming to IS: 1977 shall be used for doors, window frames, window bars, grills, steel gates, hand railing, builders hardware, fencing post, tie bars etc.
- 10.1.2 **Rivets:** Rivets shall be made from rivet bars of mild steel as per IS:1148

Please refer general specification of this item of work shall be executed as per C.P.W.D 2007 specifications Page 536 to 544.

**LIST OF MATERIALS OF APPROVED BRAND OR MANUFACTURER AND  
SPECIALISED AGENCIES  
(CIVIL) APPENDIX 'A'**

The contractor shall so quote for items to cover cost of the materials, as specified below. The contractor shall obtain prior approval from Architect/Client before placing order for the specific materials/agencies. In case of non-availability of any of the approved/ specified materials/ Agency, during the execution of the work, the Architects and Employer may approve suitable equivalent brand/ Agency and his decision shall be final and binding on the contractor and the price variations, if any, shall be adjusted accordingly.

- |      |   |   |  |
|------|---|---|--|
| 1a). | White/coloured glazed tiles                   | : | 1 <sup>st</sup> quality Somany Pilkington/<br>Jhonson & Johnson or equivalent. |
| b)   | Vitrified tiles                               | : | URO, RAK Ceramics, Khazaria<br>Johnson or equivalent.                          |
| 2.   | Flush doors                                   | : | Anand, Ravela or equivalent with<br>ISI mark.                                  |
| 3.   | Teak particle boards                          | : | Anchor, DECO, Bhutan   |
| 4.   | Sections of Aluminum doors<br>Partitions etc. | : | Standard sections Jindal specified by<br>the Employer/Architect.               |
| 5.   | Water proofing compounds                      | : | FOSROC, Pidilite and Dr.Fixitor<br>equivalent.                                 |
| 6.   | Hardeners                                     | : | Hardcrete manufactured, by<br>Snowcem (India), or equivalent.                  |
| 7.   | Paint & Distempers                            | : | Asian, Nerolac, ICI  |
| 8.   | Water proof cement                            | : | Super Snowcem or equivalent.   |
| 9.   | Water repellent Silicon paint                 | : | Pidilite or equivalent.  |
| 10.  | Glazing                                       | : | Modiguard, ASAHI, Saint Gobain   |
| 11.  | Hardware                                      | : | Jyothi (medium) classic or equivalent.   |
| 12.  | Door closers, floor springs                   | : | 'Everite' or equivalent.   |
| 13.  | Water seal (Epoxy Stearate)<br>Compound       | : | Fosroc or equivalent.  |
| 14.  | Rolling shutters, rolling grills              | : | As per IS specifications   |

- |     |                    |   |                                       |
|-----|--------------------|---|---------------------------------------|
| 15. | Ready Mix Concrete | : | Lafarge / Ultra Tech / Birla / Aparna |
| 16. | UPVC Windows       | : | NCL, Fienesta, LG or Equivalent       |
| 17. | Cement             | : | Ultratech,ACC,L&T,MODI,RASI           |

**SPECIALISED AGENCIES:**

- |    |                        |   |  |
|----|------------------------|---|--|
| 1. | Water proofing work    | : | Work to be executed through authorised/ specialist agencies of SIKA/PIDILITE/ROFF/ FOSROC with prior approval of Architects/ Air India Ltd.. |
| 2. | Anti termite treatment | : | Pest Control (India) Pvt. Or any other equivalent.   |

**GENERAL NOTE:**

Any item/specification where in it is stated as equivalent means it should be equal in respect of quality and cost. While opting any "Equivalent" make, prior written approval of Architects and Air India Ltd. shall be obtained.

### LIST OF MANDATORY TESTS

MATERIALS	TEST	TEST PROCEDURE	MIN.QTY.	FREQUENCY
Chemical and physical properties of lime.		I.S.6932 (Part I) : 1973	5 M.T.	10 mt. Or par thereof.
SAND	a. Stilt Content	Field	20 Cum	20 cum or par thereof.
	b. Bulking	Field	20 Cum	50 Cum or par thereof
	c. Particle size distribution.	Field	40 Cum	Every 40 Cum or part, required in RCC work.
COARSE AGGREGATE	a. Particle size distribution	Field	45 Cum	Every 45 cum or par thereof for RCC work. For rest of work as desired.
	b. Crushing value			b. Every 300 Cum
R.C.C.	1. Slump	Field		Once a day as desired.
	2. Cube strength		20 cum in slabs, beams, footings and connected columns	Every 20 cum of a days concrete for 7 Days & 28 Days
BRICKS	1. Water absorption and Efflorescence		Designation 35	One test for each source of manufacture.
	2. Compressive Strength.		Designation 35	1,00,000 or par thereof. For larger quantities two tests for 1 lot of 1 lakh. One test for every additional 2 lakhs or par thereof.
TIMBER	Moisture Content		1 Cum	Every three cum or part.
MORTICE LOCKS	Testing of springs		50 Nos.	100 or part thereof.
STEEL	a. Tensile strength	IS - 1529	20 Tonne	Every 20 tonne or part.
	b. Bending strength	IS - 1529	20 Tonne	Every 20 tonne or part.

MATERIALS	TEST	TEST PROCEDURE	MIN.QTY.	FREQUENCY
WHITE GLAZED TILES	1. Water absorption	I.S.777	10000 Nos.	10000 or part
	2. Crazing	- do -	- do -	- do -
	3. Impact	- do -	- do -	- do -
FLUSH DOORS	1. End immersion	I.S.2202		
	2. Knife	I.S.4020	No.of shutters used	No.of shutters to be tested.
	3. Adhesion		22 - 65 66 - 100 101 - 180 181 - 300 301 - 500 501 - above	1 2 2 3 4 5
AL.DOORS AND WINDOWS TESTING	Thickness of anodic coating	IS - 5523		If the cost of the fittings exceeds Rs.20,000/-

**Note:** Minimum quantity give above is the quantity of work which warrants conduction of respective tests.

1. Cost of samples, testing and transport will be borne by the contractors only.
2. Any other materials shall also be got tested by contractors at his own cost as per the instructions of Architects/Employer from time to time.
3. Frequency stated above is minimum and the contractor may have to test materials with any other frequency, as instructed by Architect/Client, without any costs.



## **SAFETY CODE**

Suitable scaffolds should be provided for workman for all the works that cannot safely be done from the ground or from solid construction, except in cases of short duration works, which can be done safely from ladders. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well, it shall be of rigid construction made either of good quality wood or steel. The steps shall have a minimum width of 450mm and a maximum rise of 300mm. Suitable foot and hand holds of good quality wood or steel shall be provided and the ladder shall be given an inclination not steeper than 1 in 4 (1 horizontal to 4 vertical).

Scaffolding or staging more than 300mm above the ground or floor, swung or suspended from an overhead support, shall be erected with stationery supports and shall have guard rails properly attached, bolted, braced and otherwise secured and atleast 900mm high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends there of with only such openings as may necessary for the access of persons and delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

Working platform, gangways and stairways should be so constructed that they should not sag unduly or unequally and if the height of the platform or the gangway or the stairway is more than 3-6m above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened, as described in (ii) above.

Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing, whose minimum height shall be 900mm.

Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 M in length while the width between side rails in ring ladder shall be in no case be less than 300mm. For longer ladders, this width should be increased atleast 6mm for each additional foot of length. Spacing of steps shall be uniform and shall not exceed 300mm.

Adequate precautions shall be taken to prevent danger from electrical equipment. At the work site, no materials shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall also provide all necessary fencing and lights to protect the public from accident, and shall be bound to bear the expenses of defence of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay damages and costs, which may be awarded in such suit, action or proceedings to any such persons or which may with the consent of the contractor be paid to compromise any claim by any such person.

I. **Excavation and Trenching:**

All trenches, 1.2m or more in depth, shall at all times be supplied with at least one ladder for each 30m in length or fraction thereof. Ladder shall be extended from bottom of the trench to at least 900mm above the surface of the ground. The side of the trenches which are 1.5m or more in depth shall be stepped back to give suitable slope or securely held by timber shoring, so as to avoid any danger to sides collapse. The excavated material shall not be placed within 1.5m of the edge of the trench or half of the depth of the trench, whichever is more. Cutting shall be done from top to bottom. Under no circumstances undermining or under cutting shall be done.

II. **Demolition:**

Before any demolition work is commenced and also during the progress of the work.

- a. All roads and open areas adjacent to the work site shall either be closed or suitably protected.
  - b. No electric cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall remain electrically charged.
  - c. All practical steps shall be taken to prevent danger to persons employed, from the risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so over- loaded with debris or materials, so as to render it unsafe.
- III. All necessary personal safety equipments as considered adequate by the Architects should be kept available for the use of the persons employed on the site and maintained in a condition suitable for immediate use and the contractor should take adequate steps to ensure proper use of equipment by the concerned.
- a. Workers employed in mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective gloves.
  - b. Those engaged in white washing and mixing or stacking of cement bags or any materials which is injurious to the eyes shall be provided with protective goggles.
  - c. Those engaged in welding works shall be provided with welder's protective (eye) shields.
    - a. Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.

- d. When workers are employed in sewers and manholes, which are in use, the contractor shall ensure that the manhole covers are opened and are ventilated atleast for an hour before the workers are allowed to get into the manhole and the manholes so opened shall be cardoned off with suitable railing and provided with warning signals or boards to prevent accidents to the public.
- e. The contractor shall not employ men below the age of 18 years and women on the work of painting with products containing lead in any form. Wherever men above the age of 18 years are employed on the work of lead painting, the following precautions should be taken.
  - i) No paint containing lead or lead products shall be used except in the form of paste or ready made paint.
  - ii) Suitable face masks should be supplied for use to the workers when paint is applied in the form of spray or a surface having lead paint is rubbed and scrapped.
  - iii) Overalls shall be supplied by the contractors to the workers and adequate facilities for washing shall be provided to the working painters during and on cessation of work.
- IX. When the work is done near any place, where there is risk of drowning, all necessary equipment should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provisions should be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.
- X. Use of hoisting machine and shackle including their attachments, in charge and supports shall conform to the following standards or conditions.
  - 1.a. These shall be of good mechanical construction, sound material and adequate strength and free from any patent defects and shall be kept in good working order.
  - b. Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength and free from patent defects.
  - 2. Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffolding or give signals to the operator.
  - 3. In case of every hoisting machine and of every chain, ring hook, shackle swivel and pulley block used in hoisting or lowering or as means of suspension, the safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load, each safe working load and the condition under which it is applicable shall be clearly indicated. No part of any machine or any gear referred above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

4. In case of departmental machines, the safe working load shall be notified by the clients. As regards contractor's machines the contractor shall notify the safe working load of the machines to the consultants, whenever he brings any machinery to site of work and get it verified by the consultants.
- XI. Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards. Hoisting appliances should be provided with such means as will reduce and minimise the risk of accidental descent of loads. Adequate precautions should be taken to reduce to the minimum risks of any part of a suspended load becoming accidentally displaced. Sleeves and boots as may be necessary should be provided, whenever workers are employed on electrical installations. The workers should not wear any rings, watches and carry keys or other materials, which are good conductors of electricity.
- XII. All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition. No scaffold, ladder, or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near place of work.
- XIII. To ensure effective enforcement of the rules and regulations relating to safety precautions, the arrangements made by the contractor shall be open to inspection by the clients or the Architect.
- XIV. These safety provisions should be brought to the notice of all concerned by display of a notice board at a prominent place of the workspot. The person, responsible for compliance of the safety code, shall be named therein by the contractor.
- XV. Notwithstanding the above clauses for (i) to (xiv), there is nothing in these to exempt the contractor from the operation of any other Act or Rules in force in the Republic of India.

## **LABOUR LAWS AND RULES**

The Site Engineer shall ensure that the contractor maintains relevant records and fulfils all conditions and requirements in accordance with

- a. The payment of Wages Act
- b. Employer's Liability Act
- c. Workmen's Compensation Act
- d. Contract Labour (Regulations & Abolition) Act 1970 and Central Rules 1971.
- e. Apprentices Act 1961.
- f. Any other Act or enactment relating thereto and rules framed thereunder from time to time.

The Site Engineer shall refrain from involving himself and the supervisors under him by comments/advice/attempts at mediation in any kind of labour dispute at site. His job is only to report to his superiors any happenings of the this sort in an objective manner.

### **EMPLOYER'S RESPONSIBILITY – CONTRACT LABOUR (REGULATIONS AND ABOLITION) ACT 1970 AND RULES 1971**

With a view to ensuring that the provisions of the Act are not contravened, the Site Engineer should give particular attention to the following points and see that all the provisions of the Act are enforced:

1. Principal Employer is registered as per the Act.
2. Contractor holds a licence under the Act from the Local Labour Commissioner for the appointment of Contract labour.
3. Required notice boards, registers and records as provided in section 29 of the Act are maintained by the contractor.
4. Payment of proper wages as per the rules are effected within the prescribed time limits by the contractor.
5. Prescribed facilities and amenities are provided by the contractor.
6. Proper efforts are made by the contractor to set right contravention of law, as soon as the notice pointing out the same is received from the Labour Enforcement Officer, and reports "on action taken" are sent to the Labour Enforcement officer at the earliest with copies to the Employer.

**FORMAT OF GUARANTEE TO BE EXECUTED BY THE FIRM/CONTRACTOR IN  
RESPECT OF THE WORK OF PRE-CONSTRUCTION ANTI TERMITE  
TREATMENT**

This agreement made this \_\_\_\_\_ day of \_\_\_\_\_ Two thousand \_\_\_\_\_ between \_\_\_\_\_ (Name of Air India Ltd.) a body corporate constituted under the \_\_\_\_\_ (Name of the Act) Act 19 \_\_\_\_\_ having its Head Office at \_\_\_\_\_ (herein after called 'The Employer') of the one part and \_\_\_\_\_ (Name of Firm/ Contractor) (Hereinafter called the Guarantor) of the other part.

WHEREAS THIS AGREEMENT is supplementary to a contract (hereinafter called the contract dated \_\_\_\_\_ and made between the Employer of the one part and the Guarantor of the other part) where by the Firm/Contractor interalia understood to render the building/structure completely free from any infestation of termites. And whereas the Guarantors agreed to give guarantee to the effect that the said building/structure shall remain free from any infestation of termites for a minimum period of ten years from the date of completion of pre-construction antitermite treatment carried out as per the relevant I.S. code.

Now the Guarantor hereby agrees to make good all defects and render the building/ structure free from any infestation of termites, during this period of guarantee and to the satisfaction of the Employer. The guarantor also agrees to take up such rectification work at his own cost, and within one week from the date of issue of notice from the Employer, calling upon him to rectify the defects. The decision of the Employer as to the cost payable by the Guarantor will be final and binding, in case the guarantor fails to commence the work as per above notice and the work is got done through some other contractor. That if the Guarantor fails to execute the

pre-construction anti-termite treatment of commits breach thereunder, then the Guarantor will indemnify the principal and his successors against all loss, damage, costs, expenses or

otherwise, which may be incurred by him by any reason of any default on the part of the guarantor in performance and observance of this agreement. As to the amount of loss and or damage and/or costs incurred by the Employer, the decision of the Employer will be final and binding.

In witness where of these presents have been executed by the obligation \_\_\_\_\_ and by \_\_\_\_\_ and for on behalf of the employed on the day, month and year first above written.

Signed and delivered by \_\_\_\_\_ (Air India Ltd.) by the hands of Sri \_\_\_\_\_ in the presence of \_\_\_\_\_.

Signed, and delivered by the hand of \_\_\_\_\_ (Contractor) in the presence of \_\_\_\_\_.

Signed, and delivered by \_\_\_\_\_ (Air India Ltd.) by the hands of Sri \_\_\_\_\_ in the presence of \_\_\_\_\_.

Signed and delivered by the hand of \_\_\_\_\_ (Contractor) in the presence of \_\_\_\_\_.

## **SPECIFICATIONS FOR LAYING OF CONDUITS**

1. Conduits shall be of M.S. seamless or E.R.W. as situation demands and shall not be less than 19mm dia and shall be of heavy gauge and shall be finished with stone enamelled surface. All conduit accessories shall threaded type and under no circumstances pin grip type or clamp type accessories be used. The number of PVC insulated conductors that can be drawn into rigid steel conduit are given in IS:732.
2. Bunching of cables: For lighting and power outlet circuits, the wires shall be taken in separate conduits. Insulated conductors of AC supply and DC supply shall be bunched in separate conduits.
3. In order to minimise condensation or seating inside the conduit, all outlets of conduit system, shall be properly drained, ventilated, but in such a way as to prevent the entry of insects.
4. Conduit shall be joined by means of screwed couplers and screwed accessories only. In long distance straight runs of conduit, inspection type couplers at reasonable intervals shall be provided or running threads with couplers and jam-nuts shall be provided. Threads on conduit pipes in all cases shall be between 11mm to 27mm long sufficient to accommodate pipes to full threaded portion of couplers or accessories. Cut ends of conduit pipes shall have not sharp edges or any burrs left to avoid damage to the insulation of conductors while pulling them through such conduits.
5. Conduit pipes shall be fixed by 20 SWG saddles, secured to in approved manner at any interval of 750mm but on either side of couplers or bends or similar fittings, saddles shall be fixed at a distance of 30 cm from the centre of such fittings. Where conduit pipes are to be laid along the truss/ steel joints etc., the conduits shall be secured by means of girder clips and as directed by the Engineer-in-charge. Where it is not possible to drill hole in the truss members suitable clamps with bolts and nuts as directed by Engineer-in- charge shall be used.
6. All necessary bends in the system include diversion shall be done by bending pipes or by inserting suitable solid or inspection type normal bends, elbows or similar fittings or fixing MS inspection on conduit system exposed to weather. Radius of such bends in conduits shall not be less than 7.5 cm.
7. The switch or regulator box shall be made of metal on all sides, except on the front. In the case of wild mild steel sheet boxes, the thickness of the sheet shall not be less than 18 gauge for boxes upto a size of 20 x 30 cm and above this size, 16 gauge MS boxes shall be used. Except where otherwise stated 3mm thick



Hylum sheet shall be fixed on the front with brass screws. Clear depth of the box shall not be less than 60mm and this shall be increased suitable to accommodate mounting of fan regulators in flush pattern. All fittings shall be fitted in flush pattern.

8. Inspection type conduit fittings such as inspection boxes, bends, elbows and tees shall be so installed that they remain accessible for such purpose as withdrawal of existing cables or installation of additional cables.
9. Different parts of conduit system such as bends, unions, tees, junction boxes etc., shall be adequately protected against rust particularly when such system is exposed to weather. In all cases, no bars threaded portion of conduit pipe shall be allowed unless such bars threaded portion is treated with anti-corrosive and suitable preservatives.
10. After installation, all exposed surfaces of conduit pipes, fittings switch and regulator boxes etc., shall be painted with two coats of approved enamel paint or aluminium paint as required to match the finish of surrounding wall, trusses etc.
11. Before the conductors are drawn in, the laying of conduit for each circuit or section shall be complete. The entire system of conduit after erection shall be tested for mechanical and electrical continuity throughout and permanently connected to earth by means of suitable earthing clamp, efficiently fastened to conduit pipe in a workman like a manner for a perfect continuity between each wire and conduit. Conduits shall be adequately protected from mechanical stresses.
12. Making of chase: The chase in the wall shall nearly be made and shall be of suitable dimension to permit the conduit to be fixed in the manner desired by the Engineer-in-charge. In the case of buildings under construction, chases shall be provided in the wall, ceiling, etc., at the time of their construction and shall be filled up nearly after erection of conduit and brought to the original finish of the wall.
13. Fixing of conduit in chase: The conduit shall be fixed by means of staples or by means of saddles not more than 600 mm apart. Fixing of standard bends or elbows shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself with along radius which will permit easy drawing in of conductors. All the threaded joints of rigid steel conduits shall be treated with approved preservative compound to ensure protection against rust.
14. Inspection boxes: To permit periodical inspection and to facilitate replacement of wires, suitable inspection boxes shall be provided at convenient locations. They shall be mounted in flush with the wall. The minimum size of inspection boxes shall be 75x75mm. Suitable ventilating holes shall be provided in the inspection box covers.
15. When crossing through expansion joints in buildings, the conduit sections across the joint may be through flexible conduits of the same size as rigid conduit.

