

**INTERIOR\_FURNISHING, ELECTRICAL & AC WORKS OF  
FLAT NO. 8 At 18/2 SATSANG  
MARG, SPECIAL INSTITUTIONAL AREA  
NEW DELHI- 110067.**

**FOR**

**NATIONAL INSTITUTE OF PUBLIC FINANCE & POLICY.  
(NIPFP)**



**PART-A  
(TECHNICAL BID)**

**SPECIFICATIONS DOCUMENTS :**

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### TECHNICAL BID

- Invitation to Tenderers
- Instructions to Tenderers
- General Conditions of Contract
- Special Conditions of Contract
- List of approved Materials
- Technical specifications
- Drawings

**NOTE: TENDERERS MUST VISIT THE SITE AND READ THE SPECIAL CONDITIONS AND ADDITIONAL SPECIAL CONDITIONS**

### APPENDIX SHOWING IMPORTANT SCHEDULES

- |  |   |
|--|---|
| 1. SIGNING THE AGREEMENT                       | : Within seven days of the issue of letter of intent/work order.                |
| 2. COMMENCEMENT OF WORK                        | : Within ten days of the issue of letter of intent / work order.                |
| 3. PERIOD OF COMPLETION                        | : 60 days   |
| 4. LIQUIDATED DAMAGES                          | : Rs. 15,000/- per week subject to the max of 10% of the Accepted Contract sum. |
| 5. PERIOD AND VALUE OF RUNNING/ON ACCOUNT BILL | : Twenty days   |
| 6. TOTAL RETENTION MONEY                       | : 10% of cost of work executed.   |

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7. TOTAL SECURITY DEPOSIT : Retention money + EMD.
8. REFUND OF E.M.D : To be refunded to the Contractor within Thirty days after submission and acceptance of the final bill.
9. REFUND OF RETENTION MONEY : To be refunded to the Contractor within Thirty days of the end of Defects Liability period.
10. TAX DEDUCTION : At prevailing rate from each bill.
11. DEFECTS LIABILITY PERIOD : Twelve Calendar months from the date of completion certificate from architect.
12. PERIOD OF FINAL MEASUREMENT : Within 30 days after virtual completion of work.
13. MINIMUM VALUE OF RUNNING BILL : 7.5 Lakhs (rupees seven lakhs fifty thousand).
14. DEVIATION LIMIT : Plus 25%
15. GST : item wise rates assured by the Contractor is inclusive of GST
16. Labour Cess : 1% of contract value will be deducted as Labour Cess payable to New Delhi.
17. Total tendered Amount : Rs. 21.70 lakhs
18. Value of Earnest Money two thousand only : Rs. 44,000/- (rupees forty four thousand only)
19. Electrical & Water charges : Deduction will be done as per clause no. 28 & 29 of Special Conditions of Contract (i.e 0.75+ 0.25%) of total cost of project.

## SECTION - I INVITATION TO TENDERERS

- 1.1 Sealed tenders in two bid system are invited from established experienced contractors by the Secretary, National Institute of Public Finance & Policy (NIPFP), 18/2, Satsang Vihar, Special Institutional Area, New Delhi-110067.

S.No.	Name of Work	Estimated Value of Work (Rs.)	Time of Completion
1.	Interior-furnishing, Electrical & AC works for flat no. 8, NIPFP, 18/2, Satsang Vihar, Special Institutional Area, New Delhi-110067.	21.70 lakhs	60 days

- 1.1 Tenders are invited from reputed contractors for above work under two bids system (Technical & Financial) from eligible and experienced contractors with sound financial position.

The tender document containing terms and conditions including Financial Bid etc. can be obtained from our office National Institute of Public Finance & Policy (NIPFP), 18/2, Satsang Vihar, Special Institutional Area, New Delhi-110067 during office hours (10.00 AM to 5.00 PM) on all working days (except Saturday, Sunday & holidays) between the dates given below

**Sale of tender (Date)** 10/09/ 2018 to 01/10/2018  
**Cost of tender** Rs 1,000/- (Non refundable)

The tender documents can also be downloaded from our website [www.nipfp.org.in](http://www.nipfp.org.in) or from e-Procurement site <https://eprocure.gov.in/eprocure/app> if downloaded from website then the contractor has to attach a demand draft for **Rs 1,000/-** from a Scheduled Bank shall be paid in favor of **“NIPFP” payable at New Delhi** as cost of Tender documents along with EMD failing which tender will be rejected. The right is reserved by the officer inviting this tender to revise or amend the tender documents prior to the date notified for submission of the tender. Such revisions, amendments shall be notified in the form of addendum or corrigendum at company’s Website. Bidders are advised to look at company’s website regularly for any such corrigendum.

- 1.2 Tenders are invited into two bid system i.e. **“Technical bid” and “Financial bid”**. The intending contractors should submit the following details in the technical bid duly contained in closed sealed **Envelope no. 1 super scribed as “Technical bid”**:

- a. Organizational setup
- b. **Latest solvency for Rs 10 lacs** or more with any Scheduled Bank where the contractor is maintaining his account. The Certificate should not be more than 3 month old from last date of issue of tenders
- c. Copy of Permanent account number (PAN)
- d. **Annual Report (Balance sheet and Profit and Loss Account of last 3 Years** ending March 31 of previous financial year .The average annual turnover shall be at least 30% of total estimated cost.
- e. GSTIN Registration No
- f. The tender must satisfy themselves that they have adequate experience to handle this comprehensive multi-disciplinary project within the stipulated time schedule. They should produce documentary proof of satisfactory completing at least two jobs of similar nature, costing not less than Rs 9.0 lacs, each or three similar jobs of Rs 6.0 lacs each, or one job of similar nature costing not less than Rs 18.0 lacs, for Government, Semi-Government,

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Private/Public Sector organization in last three years from the date of advertisement with complete details, name, address & phone nos. of clients etc. The similar nature works shall mean renovations and repairs involving civil, woodwork, electrical & air conditioning works.

- g. Details of projects in hand with name of clients, addresses & phone nos.
- h. Earnest money of **Rs 44,000/- ( Rupees Forty four Thousand Only )** In the form of Demand Draft from a nationalized bank in favor of “NIPFP”. Payable at **New Delhi**.
- i. **For the tenders downloaded from website Rs 1,000/- in the form of Demand Draft** from a Scheduled Bank shall be paid in favor of “NIPFP”. Payable at **New Delhi**.

The Earnest Money will be refunded without any interest to all the unsuccessful tenders after the award of the work subject to the relevant provisions in the tender documents. Any false information furnished by the contractor shall lead to the forfeiture of the earnest money.

- 1.3 The “Financial bid” shall be contained in a closed sealed envelope no. 2 super scribed as “**financial bid**”. The financial bid shall contain **Section-V Schedule of Quantities and Section-VI List of Makes/ Drawings** duly filled in by the intending tenders. This shall form the part of the agreement.

Both the sealed envelopes of “Technical bid” and “financial bid” should be kept in **envelope no. 3** sealed and super scribed with the name of work on the top of envelope shall be deposited in the office of **The Secretary, National Institute of Public Finance & Policy (NIPFP), 18/2, Satsang Vihar, Special Institutional Area, New Delhi-110067** on or before **03/10/2018** before **04:00 pm**. The tender received in any manner other than prescribed above shall be summarily rejected. The company will not accept any responsibility for the tender lost in transit. The tender’s are asked to visit, inspect / carefully the site.

- 1.4 At first instance technical bid shall be opened on **05/10/2018, 11:30 am**. The technical bid will then be evaluated on the basis of documents/information furnished, as also if necessary after physical examination of the tenders office/workshop & projects successfully executed by them. The criteria followed by the company will be at its sole discretion and will not be open to question. The contractors who shall qualify in the technical bid will only be eligible for the opening of their financial bid.

- 1.5 Date of commencement of the work shall be reckoned from the 10th day of award of work.

- 1.6 The work as detailed in this tender shall be executed and completed in all respects in accordance with the Tender documents, which includes instructions to tenders, General conditions of contract, special conditions of contract, schedule of Quantities, list of approved materials and Drawings to complete satisfaction of the Architects and the Employer.

- 1.7 Rates must be quoted for complete work at site inclusive of all costs, taxes and charges etc. All taxes and duties including GSTIN, ESI charges etc. as applicable at New Delhi on the date of receipt of tender, Central & State Taxes etc. on works and materials required for use in the execution of this project shall be entirely borne and payable by the Contractor and the Employer will not entertain any claim what so ever in this respect.

- 1.8 The tender for the works shall remain open for acceptance for a period of 180 days from the date of opening of tenders. If any Tender withdraws his tender before the said period or makes any modifications in terms & conditions of the tender which are not acceptable by the company, then the company, shall without prejudice to any other right or remedy, be at liberty to forfeit 100% of the earnest money as aforesaid.

- 1.9 Total Security Deposited during execution of work shall comprise of**

- (a) Earnest Money Deposit
- (b) Retention Money

#### **1.10 Retention Money**

The retention money (i.e. deduction from interim & final bill shall be 10% of the gross value of each bill. The retention money & earnest money shall form the total security deposit during execution of work. The retention amount will be refunded to the contractor after the end of Defect Liability Period provided he has satisfactorily carried out all the works and attended to all defects in accordance with the condition of contract. No interest is allowed on retention money & earnest money. Earnest money shall be refunded after the submission and acceptance of final bill.

- 1.11 Earnest money of the successful tender is liable to be forfeited in the event of refusal or delay on his part in signing the agreement or starting the work as mentioned in the tender and employer will be at liberty to award it to another contractor.

The competent authority on behalf of **The Secretary, National Institute of Public Finance & Policy (NIPFP), 18/2, Satsang Vihar, Special Institutional Area, New Delhi-110067** reserves to himself the right of accepting the whole or part of the tender and the tender shall be bound to perform the same at the rate quoted.

- 1.12 Canvassing whether directly or indirectly in connection with the tender is strictly prohibited and the tenders submitted by the contractors who resort to canvassing in any form would be liable to rejection.

- 1.13 The tendering firms, in case the tender is a partnership firm, shall submit the tender signed by the partners. In the event of absence of any partner, it must be signed on his behalf by a person holding power of attorney which shall be attached along with the tender and it must also disclose that the contractor is duly registered under the Indian partnership Act or not.

- 1.14 The notice inviting tender shall form part of the contract document. The successful tender/contractor, on acceptance of his tender by the Accepting Authority, shall within 10 days from the stipulated date of start of work sign the contract consisting of:

- a) The notice inviting tender, all the documents including additional conditions, invitation of tender and acceptance thereof together with any correspondence leading there to.
- b) Offer in standard tender form.

- 1.15 The tender shall unconditionally accept terms & conditions of the company. Conditional offer shall be summarily rejected.

**The Secretary,  
National Institute of Public Finance & Policy,  
18/2, Satsang Vihar, Special Institutional Area,  
New Delhi-110067.**

#### **STANDARD TENDER OFFER**

Sign & stamp of contractor

**National Institute of Public Finance & Policy (NIPFP), 18/2, Satsang Vihar, Special Institutional Area, New Delhi-110067.**

**Item Rate Tender & Contract for Works**

Tender for the Interior-Renovation, electrical & AC works of flat no. 8 at (NIPFP), 18/2, Satsang Vihar, Special Institutional Area, New Delhi-110067.

To be submitted by ..... between ..... hrs. to ..... hrs.

Issued to: .....

Signature of the person issuing the documents: .....

Designation: .....

Date of Issue: .....

**TENDER**

I/We have read and examined the notice inviting tender, Schedule, specifications applicable, Drawings & Designs, General rules and Directions, Conditions of Contract, clauses of contract, Special conditions, Schedule of Quantities & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for by **The Secretary, National Institute of Public Finance & Policy (NIPFP), 18/2, Satsang Vihar, Special Institutional Area, New Delhi-110067** within the time specified in schedule, viz., schedule of quantities and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in General Rules and Directions and the Conditions of contract and with such materials as are provided by and in respects in accordance with, such conditions so far as applicable.

We agree to keep the tender open for **One Hundred Eighty days (180 days)** from the due date of submission thereof and not to make any modifications in its terms and conditions.

A sum of Rs. **44,000/- (Rupees forty four thousand only)** is hereby forwarded in the form of Demand Draft of a Bank as earnest money. If I/we, fail to commence the work specified I/we agree that the said **The Secretary, National Institute of Public Finance & Policy (NIPFP), 18/2, Satsang Vihar, Special Institutional Area, New Delhi-110067** or the authorized officer in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely otherwise the said earnest money shall be retained by him towards security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered, **upto maximum of the percentage 25% mentioned in the schedule and those in excess of that limit market/tendered rate whichever is lower at the rates to be determined in accordance with the provision contained in the tender form.**

I/We hereby declare that I/we shall treat the tender documents drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived there from to any person other than a person to whom I/we am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of National Institute of Public Finance & Policy (NIPFP).

I/We agree that should I/we fail to commence the work specified in the above memorandum, an amount equal to the amount of the earnest money mentioned in the form of invitation of tender shall be absolutely forfeited to The Secretary, National Institute of Public Finance & Policy (NIPFP), 18/2,

Sign & stamp of contractor

Satsang Vihar, Special Institutional Area, New Delhi-110067 and the same may at the option of the competent authority on behalf of The Secretary, National Institute of Public Finance & Policy (NIPFP), 18/2, Satsang Vihar, Special Institutional Area, New Delhi-110067 be recovered without prejudice to any other right or remedy available in law out of the deposit in so far as the same may extend in terms of the said bond and in the event of deficiency out of any other money due to me/us under this contract or otherwise.

Dated.....

**Sign. of Contractor**  
Postal Address

**Witness:**  
Address:

Occupation:-

**ACCEPTANCE**

The above tender (as mentioned by you as provided in the letters mentioned hereunder) is accepted by me for and on behalf of The Secretary, National Institute of Public Finance & Policy (NIPFP), 18/2, Satsang Vihar, Special Institutional Area, New Delhi-110067 for a sum of Rs. .... (Rupees.....)

The letters referred to below shall form part of this contract Agreement:

- a)
- b)
- c)

**for & on behalf of The Secretary, National Institute of Public Finance & Policy (NIPFP), 18/2, Satsang Vihar, Special Institutional Area, New Delhi-110067.**

Dated .....

Signature/Designation.....



## SECTION-2: INSTRUCTION TO TENDERERS

2.1 The tenderer shall examine carefully all the tender documents consisting of:

### **TECHNICAL BID**

- Invitation to Tenderers
- Instructions to Tenderers
- General Conditions of Contract
- Special Conditions of Contract
- List of approved Materials
- Technical specifications / Drawings

### **FINANCIAL BID** (separately given)

- Schedule of Quantities

These shall form part of the agreement.

The tenderer is advised to visit and inspect the site at his own cost and responsibility and to secure all necessary information which may be required for completing the tender. Ignorance of site conditions or local information shall not be considered as an excuse for non-performance of the contract. All costs, charges and expenses that may be incurred by the tenderer in connection with the preparation of his tender shall be borne by him and the Employer/Architect does not accept any liability whatsoever in this regard.

- 2.2 Time is the essence of the contract and the tenderers are required to complete the work in all respects within the stipulated time of completion and hand over the same, complete in all respects to the satisfaction of the Architects/Employer.
- 2.3 The tender should contain not only the rates but also the value of each item of work entered in the prescribed column of the BOQ and all the items should be totalled up in order to show the aggregate value of the entire tender. The rates quoted by the tenderer should be expressed accurately both in words and figures so that there is no discrepancy. All corrections in the tender shall be duly attested by initials of the tenderers. Corrections if not attested, may entail rejection of tender. The rates quoted by the tenderers in item rate tender will be the basis (and not the amounts in case of discrepancies) in finalizing the tender.
- 2.4 It shall be clearly understood that the rates quoted in the tender are to be for complete work at site as per instructions to tenderers, conditions of contract, special conditions of contract specifications and drawings, addenda referred to therein and also for all such work's as are necessary for the proper completion of the contract. Although specific mention thereof may not have been made in the specifications or in drawings or in tender documents. The rates shall be firm and shall not be subject to cost escalation on account of labour and material and labour conditions or any other reason whatsoever.
- 2.5 The tenderers shall use only the form issued with this tender to fill up the rates.
- 2.6 Every page of the tender shall be signed on the **bottom of right hand side** and any tender not so completed is liable to be treated as defective and liable to be rejected.
- 2.7 The successful tenderer will be notified about the acceptance of his tender by the employer and he will execute agreement within 7 (seven) days thereof, failing which his tender would be liable to rejection with forfeiture of the Earnest Money and the employer would be at Liberty to award it to another tenderer.

Sign & stamp of contractor

- 2.8** The contract will be governed by the Indian Contract Act, Indian Sale of goods Act and all other relevant laws. All payments due to the contractor under the contract will be made in Indian Rupees Currency.
- 2.9** The rates quoted shall be for complete work at site and should be inclusive of incidentals expenses necessary for carrying out the work. The rates shall be inclusive of GST as applicable at New Delhi for or any other tax or duty levied by any Government or Public bodies. The rates shall be firm and shall not be subject to cost escalation of labour and material and exchange variations, labour conditions or any other conditions whatsoever.
- 2.10** A schedule of approximate quantities for various items accompanies this tender. It shall be clearly understood that neither the architect nor the employer accept any responsibility for the correctness or completeness of this schedule in respect of items and quantities and this schedule is liable to alterations by omission, deduction or additions at the discretion of the employer in consultation with the architect without violating the terms of the contract.
- 2.11** The employer does not bind himself to accept the lowest or any tender or to assign any reason thereof and also reserves the right of accepting the whole or part of the tender. The part acceptance will not violate the terms and conditions of the contract and will execute the work at the specified rates without any extra charges or compensation.
- 2.12** Tax deductions will be made as per the prevailing rates from the contractors on account bills as notified by the various govt. authorities.

## SECTION III - GENERAL CONDITIONS OF THE CONTRACT

### 3.1.0 DIRECTIONS REGARDING PROCEDURES

In construing these conditions, specifications and Contract Agreement, the following words shall have the meaning here in assigned to them except where the subject or context otherwise requires:

- (a) "Employer" Shall mean The Secretary, National Institute of Public Finance & Policy (NIPFP), 18/2, Satsang Vihar, Special Institutional Area, New Delhi-110067 and shall include his (their) legal representative/s assign/s or authorized officer.
- (b) "Contractor/Builder" Shall mean the individual or firm or company, whether incorporated or not, undertaking the work and shall include legal personal representatives of such individual or the persons comprising such firm or company or the successors of such individual or firm or company and the permitted assignee of such individual or such individual or firm or company.
- (c) "Architect" Shall mean M/s SPACEACE whose registered office is situated at **V-20 A/05, DLF Phase-III, Gurgaon, Haryana-122002.** (and shall include his authorized representative) or in the event of his death or termination of his services by the Employer in his sole and unqualified discretion, such other person/persons as shall be provided always that no person subsequently appointed to be Architect under this contract shall be entitled to disregard or over rule any previous decision or direction given or expressed by the Architect specified here in unless otherwise approved by the Employer.
- (d) "Contract" Means the documents forming the tender and acceptance thereof and the formal agreement executed between the competent authority on behalf of **The Secretary, National Institute of Public Finance & Policy (NIPFP), 18/2, Satsang Vihar, Special Institutional Area, New Delhi-110067** and the Contractor, together with the documents referred to there in including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Engineer-in-Charge and all these documents taken together, shall be deemed to form one contract and shall be complementary to one another.

In the contract, the following expressions shall, unless the context otherwise requires have the meanings, hereby respectively assigned to them:

- (i) The expression **works** or **work** shall, unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional.
- (ii) The **site** shall mean the land/or other places on, into or through which work is to be executed under the contract or any adjacent land, path or street through which work is to be executed under the contract or any adjacent land, path or

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street which may be allotted or used for the purpose of carrying out the contract.

- (iii) **Schedule(s)** referred to in these conditions shall mean the relevant schedule(s).
- (iv) **Tendered Value** means the value of the entire work as stipulated in the letter of award of work.

### 3.1.1 General

The work shall be carried out strictly in accordance with the drawings amplified by the specifications of materials and workmanship given hereunder. The drawings and specifications shall be taken together and shall complement each other. In case of any discrepancy, the following order of preference shall be followed:

- (a) Particular Specifications.
- (b) Drawings.
- (c) CPWD Specifications & DSR 2016.
- (d) National Building Code and Relevant IS Provisions.

In case there are no specifications for items shown on the drawings or where items are not exhaustively described, the general specifications of CPWD shall be followed for which nothing extra shall be paid. However the specification should be got approved from the Architect before commencement of work.

### 3.1.2 Drawings and Specifications

- (a) After signing the Contract, the contractor will be given free of charge three prints of all working drawings. The contractor shall make at his own expense any additional copies he requires. One copy of the drawing furnished to the contractor as aforesaid shall be kept by the contractor at site and the same shall, at all reasonable times be available for inspection and use by the Architect and his representatives any by any other person authorized by him in writing.
- (b) Such further drawings and instructions including revisions, as the Architect may furnish to the Contractor shall form part of this contract.
- (c) Only figured dimensions and detailed drawings shall be followed. The Contractor shall verify all dimensions in the field before any work is started and obtain instructions of the Architect in case of any discrepancy.
- (d) The Architect with approval of The Secretary (NIPFP), shall have power and authority to supply to the Contractor from time to time during the progress of the work, such further drawings and instructions as shall be necessary for the purpose of proper and adequate execution and maintenance of work and the Contractor shall carry out and be bound by the same.

### 3.1.3 Architects Status and Decisions

- (a) Status:

The Architects shall have general supervision and direction of the work. He has authority with due consultation of the Employer to stop the work whenever such stoppage may be necessary to ensure the proper execution of the work. The architect shall be the interpreter of the conditions of contract and the judge of its performance subject to the approval of The Secretary (NIPFP),

- (b) Decisions:

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The Architect shall, within a reasonable time, make recommendation on all claims of the contractor and on all other matter relating to the execution & progress of the work or the interpretation of the contract documents. The decisions, opinion direction of the Architects with respect to all or any of the following matters shall be referred to The Secretary (NIPFP) and decision so taken shall be final & binding to the contractor.

- i) Variation or modifications of the design.
  - ii) The quality or quantity of works or the additions/alterations or omissions or substitutions of any work.
  - iii) Any discrepancy in the drawings or between the drawings and or specifications.
  - iv) The removal and / or re-execution of any work by the contractor.
  - v) The dismissal from the work of any persons employed therein.
  - vi) The opening up for inspection of any work covered up.
  - vii) The amending the making good of any defects under defects liability period.
  - viii) Approval of materials and workmanship.
  - ix) The contractor to provide everything necessary for the proper execution of the work.
- (c) The employer shall be at liberty to take over the project at any time get the work executed directly under the supervision of The Secretary (NIPFP). The power vested in the Architect under this tender shall automatically be vested in the Chief Regional Manager thereafter.
- (d) In the event of any dispute under this contract or between the Architect & the contractor, the matter will be referred to The Secretary (NIPFP) for speedier decision & the decision will be final & binding to the parties' dismissal. In case the contractor refers the matter to The Secretary (NIPFP) for speedier decision.
- (e) Dismissal:

The contractor shall on the report of the architects immediately dismiss from the works within 24 hours any person employed by him for the above work, who may, in the opinion of Architects be incompetent or misconducts himself and such person shall not be re-employed on the works without the permission of the Architects.

### **3.2.1 Extent of Contract**

The contractor shall supply at his own cost all material implements, ladders, cordage, tackle, scaffolding and temporary works required for the proper execution of the work whether original, altered or substituted and whether included in the specifications or other documents forming part of the contract or referred to in these conditions or not and which may be necessary for the purpose of satisfying of conditions he is entitled to be satisfied which he is entitled to require together with carriage therefore to and from the work. The contractor shall also supply survey instruments and other materials necessary for the purpose of setting out works, and counting weighing and assisting to the measurement or examinations at the any time and from time to time of the work material, failing his so doing the same may be provided by the engineer-in-charge at the expense of the contractor and the expenses may be deducted from any money due to the contractor under the contract from his security deposit or the proceeds of sale thereof. The contractor shall also provide a sufficient portion of fencing and lights required to protect the public from accident, and shall be bound to bear the expenses of defense brought by any person for injury sustained owing to neglect of the above precautions

Sign & stamp of the contractor

and to pay any damage and costs which may be awarded in any such suit, action or proceedings to any such person or which may with the consent of the contractor be paid to compromise any claim by any such person. In no case, the employer shall be a party to any such claim/claims and the contractor shall indemnify the employer against any claim for any person on this account.

### **3.2.2 Sufficiency of Tender**

The contractor shall be deemed to have satisfied himself before tendering to the correctness and sufficiency of his tender for the work and of his prices for the work and of his prices stated in the schedule, which shall, except in so far as it is otherwise provided in the contract, cover all his obligations under the contract and all matters and things necessary for the proper completion and maintenance of the work.

### **3.2.3 Assignment or Sub Letting of Contract**

The contractor shall not assign the contract or any part thereof or any benefit or interest therein or there under or any claim arising out of the contract to any other party without the prior written consent of the employer.

### **3.2.4 Power to make Alterations**

Architect with due approval of the Employer shall have power to make any alterations or additions to the stipulated specifications, drawings, designs, and in instructions that may appeal to him to be necessary or, advisable during the progress of the work and the contractor shall have no claim for compensation on account of such alterations or additions. The contractor shall be bound to carry out the work in accordance with any instructions which may be given to him in writing signed by the Architect and such alterations shall not invalidate the contract and any additional work which the contractor may be directed to do in the manner above specified as part of the work shall be carried out by the contractor on the same conditions in all respects on which he agreed to do the main work and at the same rates as are specified in the tender for the main work. The time for the completion of the work shall be extended in the proportion that the additional work bears to the original contract work and the certificate of the Architect shall be conclusive as to such proportions.

### **3.3.0 WORKS SUBJECT TO APPROVAL OF ARCHITECT**

All works to be executed under the contract shall be subject to approval of the employer, through the architect who shall be entitled to direct at what point or points and in what manner they are to be commenced and from time to time carried on.

### **3.3.1 Urgent Repairs and Urgent works**

If by reason of any accident or failure or other event occurring to or in connection with the work or any part thereof either during the execution of the work or during the period of Guarantee, any remedial or other work or repair shall in the opinion of Architect be urgently necessary for security and the contractor is unable or unwillingly at once to do such work or repair, the employer may on its own get the work done/remedied/repared as the Resident Engineer may consider necessary. If the work or repair so done by the employer is such, which, in the opinion of the Architect the contractor was liable to do at his own expense under the contract, all costs and changes incurred by the employer in doing so shall on demand be paid by the contractor to the employer or may be deducted by the employer from any money due or which may become due to the contract. Provided always that the resident engineer shall soon after the occurrence of any such emergency as may be reasonable notify the contractor thereof in writing.

Sign & stamp of the contractor

### **3.4.0 DIRECTION FOR EXECUTION OF WORK**

#### **3.4.1 Setting outs**

The contractor shall be responsible for the true and proper setting out of the works in relation to the original points, lines and levels of reference given by the architect in writing and for correctness subject as above mentioned of all the positions, levels dimensions and alignments of all parts of the work and for the provision of all necessary instruments, appliances and labour in connection therewith. If at any time during the progress of the work any error shall appear or arises in any part of the work, the contractor on being required to do so by The Secretary (NIPFP) shall at once inform the architect or their representatives. The checking of the work by the architect/representative shall not in any way relieve the contractor from his responsibilities of carrying out the work as per the best practices of construction.

#### **3.4.2 Work to be to the satisfaction of the Architect**

The contractor shall execute, complete and guarantee the work in accordance with the contract to the satisfaction of the architect and shall comply with the adhere to their instructions & directions concerning the work.

#### **3.4.3 Engagement of Labor**

The contractor shall employ labor in sufficient numbers either directly or through subcontractors, where such sub letting is permitted to maintain the required rate of specified in the contract and to the satisfaction of the architect. The contractor shall not employ in connection with the works any person who has not completed his fifteen years of age.

The contractor shall comply with the provisions of the payment of Wages Act, 1936; Minimum Wages Act, 1948; Act, 1947; Maternity Benefit Act, 1961 and Mines Act, 1938, Labour Contract (Regulations & Abolishing) Act or Rules, or any modifications thereof or any other law relating thereto and rules made there under time to time.

The contractor shall indemnify the employer against any payment to be made under and for observance of the Regulation aforesaid without prejudice to his right to claim indemnify from his sub-contractors.

The contractor shall provide and maintain at his own expenses all rights, guards, fencing and watching when and where necessary or required by the Resident Engineer for the protection of the works or for the safety and convenience of those employed on works or the public.

#### **3.4.4 Disruption of Progress**

The contractor shall give written notice to the Architect and employer whenever planning or progress of the works is likely to be delayed or disrupted unless any further drawings or order, including a direction, instruction or approval is issued by the Architect within a reasonable time. The notice shall include details of the drawing or order required and by when if is required and of any delay or disruption likely to be suffered if it is late.

If, by reason of any failure or inability of the Architect to issue within a time reasonable in all the circumstances any drawings or order requested by the contractor and the work suffers delay then the architects shall take such delay into account in determining any extension of time to which the contractor is entitled under provisions of contract hereof, however no other compensation will be admissible on this account.

#### **3.4.5 Rectification of Defects**

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if, it shall appear to the Architect or his representative in-charge of the works that any work any has been executed with unsound, imperfect or un-skillful workmanship or material or any inferior description, the contractor shall, on demand, in writing from the Architect specifying the work material or articles complained of shall rectify or remove and reconstruction work so specified in part, as the case may require.

#### **3.4.6 Variation**

**In case the quantity of any item of the work executed increases by more than 25% from the quantity given in the tender document, the rate of such item would be settled as under:**

- a) **Rate of the item worked out as per market rate.**
- b) **Rate of the item quoted by the contractor.**

**The rate of such item would be lowest of the two rates mentioned above.**

**3.4.7** The contractor shall submit the samples of various materials for the approval of the Architect. The contractor shall use the material only after the approval of the Architect. The verification of the material shall be done on random base during the progress of the work in either the following manner:

- (a) Random samples would be picked up during execution of work from site & if decided by the Architect, it would be sent to one of the approved laboratories for test & quality check. The cost of such tests would be borne by the contractor.
- (b) The Architect may direct the contractor to submit the challan of delivery of the material brought at site. It would be on Random based. The Architect may also direct the contractor to submit the copy of the test/verification certificate provided by the manufacturer of that particular material.

#### **3.4.8 Free Access to work site**

The contractor shall provide all necessary and reasonable facilities and free access to the works and his records at site of work to the Architects, Resident Engineer and their representatives. He shall provide facilities and space to the satisfaction of the Architect or his representative for inspection of any part of work.

#### **3.4.9 Inspection of work**

All work under or in course of execution or executed in pursuance of the contract shall at all times be open to inspection and supervision of the Architect or his representative and the contractor shall at all times with reasonable notice or the intention of the Architect or his representatives to visit work shall have been given to the contractor, either himself be present to receive orders and instructions, or have responsible agent duly accredited in writing present for that purpose. Orders to the contractor's agent shall be deemed to have given to the contractor himself.

#### **3.4.10 Preparation of Construction Programmed Schedule**

As and when sufficient planning information is available, the contractor in consultation with the Architect shall prepare a programmed schedule of the activities. Contractor should prepare bar-charts & articles path method analysis of the light of the tendered quantities and their rates respectively. Under no circumstances shall this schedule be prepared later than one week of finalization of contract. Throughout the work, all programmed, schedules and charts shall be revised wherever any significant change occurs. The contractor shall also submit weekly progress chart to the Architect.

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### **3.4.11 Site Order Book**

The contractor shall maintain a Site Order Book at the site of the works wherein the instructions of the architect/ The Secretary (NIPFP) or their representatives shall be reasoned. The site order book shall be the property of the employer and the instructions recorded therein shall be deemed to have the same force and effect as if they had been given to the contractor himself. The contractor or his representative on the site must sign the book in token of his having persuade the orders given therein.

### **3.4.12 Hindrance Register**

A Hindrance Register shall be maintained at the site of work wherein the contractor shall notify the items affected and the execution of work, the date on which the delay was cleared. These entries shall be initialed by The Secretary (NIPFP) /Architect as well.

### **3.4.13 Suspension of Work**

The contractor shall on the written order of The Secretary (NIPFP) suspend the progress of the work or any part thereof for such time or time and in such a manner as The Secretary (NIPFP) may consider necessary and shall during such suspension properly protect and secure the work as considered necessary in the opinion of The Secretary (NIPFP) or their representative-in-charge of the work. No compensation shall be payable to the contractor on what so ever account for the suspension of work.

### **3.4.14 Extension of time for completion**

If the contractor shall desire an extension of the time for completion of the work, on his having been unavoi dably hindered in its execution or on any other ground, he shall apply in writing to the architect within three days of the date of starting of the hindrance on account of which he desires such extension as aforesaid. The architect in consultation with emp loyer shall, if, in his opinion, will authorize, such extension of time, if any, as may in his opinion be necessary or proper extension granted shall be without prejudice to the right of the Employer to recover compensation for delay as per **provisions of Para 3.4.15**

### **3.4.15 Liquidated Damages for Delay**

The times and date stipulated in the contract for the completion of the work or any part or stage thereof shall be deemed to be the essence of the contract.

The work shall, throughout the stipulated period of the contract, be carried out with all diligence. If the contractor fails to complete the work within the time prescribed or within the extended time under the contract, he shall pay to the Employer on demand amount without prejudice to other rights and remedies the Employer may have against the contractor, a sum of Rs. 15,000/-(rupees fifteen thousand per week) as liquidated damages for such fault, if the work remain unfinished after the stipulated date of completion provided that the total liquidated da mages payable shall not exceed 10% of the accepted contract price. The Employer may, without prejudice to any other method of recovery, deduct the amount of such damages from any money due or which become due to the contractor. The recovery or deduction of such damages shall not relieve the contractor from any obligations and liabilities under the contract.

### **3.4.16 Defects Liability Period**

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The contractor shall be responsible to make good and remedy at his own expense within such period as may be stipulated by the employer any defect which may develop or may be noticed before the expiry of 12 (twelve) months from the date of completion and intimation of which has been sent to the contractor within seven days of the expiry of the said period.

#### **3.4.17 Rectification of Defects caused to the building by labor:**

If the contractor or his work people, or servants shall break, deface, injure, or destroy any part of a building, or interiors, then the contractor has to rectify the same part at his own expenses to the satisfaction of the Architect.

#### **3.4.18 Approval of Materials**

The contractor would bring samples of necessary materials per the directions & would get them approved prior to execution of work from the architect or his representative.

### **3.5.0 SECURITY DEPOSIT**

#### **3.5.1 Rate of Security Deposit (Retention Money)**

The employer will, at the time of making any payment to the contractor for work done or supplies made under the contract deduct 10% of Gross value of each interim bill. The maximum amount of Retention money + Earnest Money shall amount to total Security Deposit.

All compensations or other sums of money payable by the contractor to the employer in terms of this contract may be deducted from, or paid by, the sale of a sufficient part of his security deposit, or from any sums which may become due to the contractor by the employer on any account whatsoever, and in the event of his security deposit being reduced by reason of any such deduction or sale as aforesaid, the contractor shall within ten days. Thereafter make good in demand draft, endorsed in favor of the employer as aforesaid any sum or sums which may have been deducted from, or raised by sale of his security deposit or any part thereof.

#### **3.5.2 Forfeiture of Security Deposit**

The above said security deposit shall be liable to forfeiture wholly or in part at the sole discretion of the Employer if the contractor fails to carry out the work or perform or observe any of the conditions of the contract.

#### **3.5.3 Interest on the Security Deposit**

No interest would be payable by the employer to the contractor on the security held in deposit.

#### **3.5.4 Responsibilities for the Structural Adequacy**

The contractor shall comply with the provisions of the contract and with due care and diligence, execute and maintain the work and provide all labor, including supervision of all works, structural plans and other things whether of temporary or permanent nature required for such execution and maintenance in so far as the necessary for providing these, is specified or is reasonably inferred from the contract. The contractor shall take full responsibilities for the adequacy, suitability and safety at site of all the works and methods of the construction provided.

The Contractor shall ensure that his workmen do not create nuisance in the area of hamper with the normal working of the premises / complex.

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### **3.6.0 MEASUREMENT AND PAYMENTS**

**3.6.1** All bill supported with measurement details shall be submitted by the contractor fortnightly to the Architect for all works executed in the previous period and the Architect or his representative shall verify the requisite measurement for the purpose of having the same verified for the claim as far as admissible, if possible before the expiry of 10 days from the presentation of the bill.

All measurements to be taken in duplicate and all bills shall be submitted in triplicate along with a contractor's copy of each.

#### **3.6.2 Final Bill**

Final bill supported with consolidated measurement of the full work executed shall be submitted by the contractor within 1 month of completion of work.

When the final bill has been verified and corrected, the architect will give seven days notice to the contractor to countersign the bill in token of acceptance, the contractor shall countersign the bill within the above seven days or intimate in writing his intention to dispute. If the contractor fail to take appropriate action as above within the period prescribed, the bill finalized by the architect or his representative shall be final and binding on the contractor and the contractor shall have no right to dispute the same.

#### **3.6.3 Claim for Interest**

No claim for interest will be entertained by the Employer with respect to any moneys or balances which may be in its hands owing to a dispute between itself and the contractor or with respect of any delay on the part of the employer in making interim or final payments or otherwise.

#### **3.6.4 Rates for extra Additional, Altered or Substituted work**

The rates for additional, altered or substituted work shall be worked out in accordance with the following provisions in their respective order.

- i) If the rates for similar additional, altered or substituted work and directly available in the contract for the work, the contractor is bound to carry out the work at the same rates as are available in the contract for the work.
- ii) If the rates for additional, altered or substituted work are not directly available in the contract for the work the rates will be derived from the rates for a similar class of work as a re specified in the contract for the work.
- iii) If the rates for the altered, additional or substituted work cannot be determined in the manner specified in sub -clause (I) to (ii) above, then the contractor shall within three days of the date of receipt of order to carry out the work, inform the Architect of the rate which it is intending to charge for such works supported by analysis of the rate or rates claimed (CPWD analysis). Rates finalized and approved by the Architect on the basis of these details will be final and binding. However, the architect by notice in writing will be at liberty to cancel his order to execute such work and arrange to carry it out in such a manner as he may deem advisable, but under no circumstances shall the contractor suspend the work once ordered in writing on the plea of non-settlement of rate.

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### **3.6.5 Reimbursement of Variation in Price**

Prices and rates quoted by the bidders shall be considered as firm for the complete work and entire duration of the contract. No claim for extra payment due to any rise in rates of raw material and labour or due to whatsoever reasons shall be considered, not even for extended period of completion.

### **3.7.0 GUARANTEES**

#### **3.7.1 Quality of Work**

The contractor shall guarantee that the materials and workmanship are the best of their respective kinds for the service intended and that all items of work will be free from all inherent defects in workmanship and materials. He shall also guarantee that the works will not fail in any respect due to quality of materials, workmanship and methods of construction.

The specifications assume a proper degree of skill on the part of contractor and workmen employed. The contractor shall consult the Architect or his representative, whenever in his judgment variation in the methods of construction or in the quality of material would be beneficial methods of construction or in the quality of material would be beneficial or necessary to fulfill the guarantee called for. Such variations may be made by the contractor only when authorized by the architect with due approval from the Employer.

#### **3.7.2 Rejection**

If during the "Period of Guarantee", as defined under clause 3.7.6 hereof, any work or material shall fail in any respect to meet the above guarantee, the contractor shall replace such work or material in a condition which will meet the above guarantee, immediately.

#### **3.7.3 Cost of Execution of work or repair etc.**

All work of repair shall be carried out by the contractor at his own expense if the necessity thereof shall in the opinion of the Architect be due to the use of materials or workmanship not in accordance with the contract or on account of neglect or failure on the part of the contractor to comply with any obligation expressed or implied on the contractor's part under the contract.

#### **3.7.4 Remedy on Contractor's failure to carry out the work required**

If the contractor shall fail to do any such work as aforesaid required by the architect the employer shall be entitled to carry out such work which the contractor should have carried out, at the contractor's own cost. The employer shall be entitled to recover from the contractor the cost thereof or may deduct the same from any money due or that may become due to the contractor.

#### **3.7.5 Certificate of completion of works**

On completion of the work, the contractor shall be furnished with a certificate, but no such certificate be given nor shall the work be considered to have been completed until the contractor shall have removed from the area of the premises (to be distinctly marked by the Architect/ The Secretary (NIPFP) in the site plan which, the work shall be executed) all scaffolding, surplus materials and rubbish and clean the dirt from all wood work, doors, windows, walls, floors or other parts of any building, in or upon which the work is to be executed, or of which he may have had in possession for the purpose of the execution hereof. If the

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contractor shall fail to comply with the requirements of the clause as to the removal of scaffolding, surplus materials and rubbish and cleaning off dirt on or before the date fixed for the completion of the work, the architect may at the expense of the contractor remove such scaffolding, surplus materials, and the contractor shall forthwith pay the amount of all expense so incurred, and shall have no claim in respect of any such scaffolding or surplus materials aforesaid, except for any sum actually realized by the sale thereof.

### **3.7.6 Period of Guarantee for Complete work**

The period of Guarantee for the works shall be **twelve** months starting from the date of issue of the completion certificate.

### **3.7.7 Contract Valid during Guarantee Period**

This contract shall remain valid and in force until the expiry of Guarantee period.

## **3.8.0 RESCINDING/TERMINATE CONTRACT**

### **3.8.1 Rescinding Contract**

In any case in which under any clause or clauses of this contract the contractor has rendered himself liable to pay compensation amounting to the whole of his security deposit in hand of employer (whether paid in one sum or deduced by installments) the architect on behalf of the employer shall have power to adopt any of the following course, as deemed best suited to the interests of employer.

- (a) To rescind the contract (of which rescission notice in writing to the contractor under hand of the architect shall be conclusive evidence), and in which case the security deposit of the contractor shall stand forfeited and be absolutely at the disposal of the employer.
- (b) To employ a contractor paid by the employer and to supply materials to carry out the work, or any part of the work, debiting the contractor with the cost of the labor and the price of the materials on site (of the amount of which cost and price certificate of architect shall be final and conclusive against the contractor) and crediting him with the value of the work done, in all respects in the same manner and at the same rates as if it has been carried out by the contractor under the terms of the contract. The certificate of the architect as to the value of the work done shall be final and conclusive against the contractor.
- (c) To measure up the work of the contractor, and to take such part of the work of the contractor as shall be unexecuted out of his hands, and to give it to another contractor to complete in which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor if the whole work has been executed by him (of the amount of which excess certificate in writing of the architect shall be final and conclusive) shall be borne and paid by the original contractor and may be deducted from any money due to him by employer under the contract or otherwise, or from his security deposit or the proceeds of sale thereof, or a sufficient part thereof.
- (d) In the event of any of the above courses being adopted by the architect, the contractor will have no claim to compensation to any loss sustained by him by reason of his having purchased any materials, or entered into any engagements made any advances on account of execution of the work or performance of the contract. And in case of the provisions aforesaid, the

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contractor shall not be entitled to be paid for any work actually performed under this contract unless and until the architect shall have certified in writing the performance of such work and the value payable in respect and he shall only be entitled to be paid the value so certified.

### **3.8.2 Termination of the Contract**

If at any time after the commencement of the work the employer for any reason whatsoever does not require the whole or part thereof as specified in the tender to be carried out, Architect/ The Secretary (NIPFP) shall give notice in writing of the fact to the contractor who shall have no claim to any payment or compensation whatsoever on account of any profit or advantage, which would have derived from the execution of the work in full, but which he did not derive in consequences the full amount of the work not having been carried out, neither shall he have any claim nor compensation by reason of any alterations having been made in the original specification, or the designs and instruction on which shall involve any containment of the work originally contemplated.

### **3.8.3 Jurisdiction**

The contractor and its operation shall be governed by the law of India for the time being in force, irrespective of the place of delivery of materials the place of execution of work or place of payment under this contract shall be deemed to have been entered into at New Delhi.

### **3.8.4 Bye Laws of Local Authorities**

The contractor shall conform to the provisions of any Government Acts which relate to works and to the regulations and bye laws of any local authorities. The contractor shall give all such notices required by the said Act or Laws, etc., and pay all fees payable to such authorities and allow for these contingencies in his tendered rates including fees for encroachment, stacking charges, costs of restorations, etc., and all other fees payable to the local authorities. The contractor shall keep the employer indemnified against all penalties and liabilities for every breach of any such Act, Rules, Regulations or Bye-laws.

Contractor shall comply with all laws and statutory regulations dealing with the employment of labor such as:

- a. The payment of wages Act, 1936
- b. The Minimum Wages Act, 1938
- c. The Workmen Compensation Act, 1923
- d. The Contract Labor (Regulations & Abolishing) Act.
- e. The employer's liabilities Act, 1938
- f. Industrial Dispute Act, 1938
- g. Maternity Benefit Act, 1961
- h. The Employees State Insurance Act, 1948 .

Safety code, labor welfare Act or rules or any modification thereof any other laws and regulations framed by the Competent Legislative Authorities from time to time.

### **3.8.5 Liaisoning & Co-ordination with Local Municipal Authorities**

The contractor has to liaison and take any clearance from local authorities like MCD/ DDA / other municipal authority for approval to start renovation and during renovation of work. He has to take also any Clearance from New Delhi Fire Service if needed and NOC and completion Certificate if needed. Only statutory fees will be reimbursed by NIPFP.

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## SECTION IV – SPECIAL CONDITIONS OF THE CONTRACT

### 4.1.0 Insurance for Works

The contractor at the time of signing the contract or before commencing the execution of work, without limiting his obligations and responsibilities shall insure the works at his own cost and keep them insured until the virtual completion of the contract against all acts of God including Fire, Theft, Riots, War, Floods etc. with a Nationalized Insurance company in the joint names of the employer and the contractor (the name of the former being placed first in the policy) for the full amount of the contract. Such policy shall cover the property of the employer and fees for assessing the claim and in connection with its services generally therein and shall not cover any property of the Contractor or of any sub contractor or employee.

**The contractor shall deposit the policy and receipt for the premiums with the employer within seven (7) days, from the date of signing of the contract/commencement of the execution of the work or unless otherwise instructed by the employer.** In default of the contractor insuring as provided above, the employer on his behalf may so insure and may deduct the premiums paid from any moneys due on which may become due to the contractor. The contractor shall as soon any claim under the policy is settled on the work reinstated by the Insurance office should elect to do so, proceed with all due diligence with, the completion of the works in the same manner as through the misfortune/accident had not occurred and in all respects under the same conditions of the contract. The contractor in case of rebuilding or reimbursement after accident shall be entitled to such extension of time for completion, as the employer deems fit.

### 4.1.1 Insurance in respect of damage to persons and property

- a. 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 the operation or neglect of himself or of any approved sub-contractor's or employees, whether such injury or damage arise from carelessness, accident or any other cause whatsoever in any way connected with the carrying out of this contract. The clause shall be held to include any damage to buildings, whether immediately adjacent or otherwise, and any damage to roads, streets, foot paths, bridges and works forming the subject of this contract by frost or other inclemency of the weather. The contractor shall indemnify the employer and hold him harmless damage to persons or property as aforesaid and also respect of any claims made in respect of injury or damage under any Acts of Government or otherwise and also in respect of any award of compensation of damages consequent upon such claims.
- b. 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.
- c. The contractor shall indemnify the employer against all claims which may be made against the employer by any member of the public or other third party in respect of works in consequence thereof and shall at his own expense arrange to effect and maintain, until the virtual completion of the contract, with any Nationalized Insurance company in the joint name of the employer and the contractor against such risks and deposit such policy or policies with the employer from time to time during the currency of this contract. The contractor shall similarly indemnify the employer against all claims which

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may be made upon the employer whether under the Workman's Compensation Act or any other statute in force during the currency of this contract or at common law in respect of any employee of the contractor or any sub-contractor and shall at his own expenses effect and maintain 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 of policies with the employer and the contractor against such risks and deposit such policy or policies with the employer from time to time during the currency of the contract. The contractor shall be responsible for anything which may be excluded from the insurance policies above referred to and also for all other damages to any property arising out of and incidental to the negligent or defective carrying out of this contract. He 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 there from.

- d. The employer shall be at liberty and is empowered to deduct the amount of any damages, compensation costs, charges and expenses arising or occurring from or in respect of any such claim or damage from any sum or sums due to or become due to the contractor including the security deposit.
- e. If the contractor fails to comply with the terms of these conditions, the employer may insure the works and may deduct the amount of the premiums paid from any moneys that may be or become payable to the contractor or may at the option, not release running payment to the contractor until the contractor shall have complied with the terms of this condition.
- f. Such insurance whether effected by the employer or the contractor will not limit or bar the liability and obligation of the contractor to deliver the works to the employer completed in all respects according to the contract. In case of loss or damage due to any of the aforesaid clause, the moneys payable under any such insurance shall be received and retained by the employer until the works are finally completed and such moneys shall then be credited to the contractor in final settlement of accounts.
- g. The works shall be executed in close co-ordination with the progress of other work. This being absence of the contract, no claim for idles labor will be entertained.

## **5. INSPECTION OF DRAWINGS:**

Before filling in the tender, the contractor will have to check up all the drawings and Schedule of Quantities, and will have to get an immediate clarification if any from the Architect feels is vague or uncertain. No claim for damages or compensation will be entertained on this account.

## **6. CONTRACTOR TO VISIT SITE:**

Each tenderer must before submitting his tender, visit the site of works so as to ascertain the physical site conditions and prices, availability and quality of materials according to specifications before submitting the tender.

## **7. EXECUTION OF WORK:**

The whole of the work as described in the Contract (including the Schedule of Quantities, the Specifications, General / Special Conditions and all drawings, pertaining thereto) and as advised by the Architect from time to time is to be carried out and completed in all its parts to the entire satisfaction of the Architect. Any details of execution, which may not have been

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definitely referred to in this contract, but which are usual in interior works 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, work contract tax etc., as well as transportation, so as to execute the contract as per the rules and regulations of local bodies, and Government of India.

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

- a) Labour, maintenance, Fixing, carrying, Cleaning, making good, hauling, watering etc.
- b) Plant, Scaffolding, frame work, English ladders, ropes, nails, spikes, tools, materials and workmanship protection from weather, shuttering, temporary supports, Platform etc.
- c) AH temporary canvas, lights, barricades etc. The Architect will be the sole judge in deciding as the suitability of the tools or plants that might be brought to the site of works by the Contractor for the proper execution of the work.

#### **8. SITE MEETINGS:**

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

#### **9. SECURITY:**

The Contractor shall ensure t h a t only authorized persons or materials shall enter or leave the works sue. The contractor shall also make his own arrangements for the protection and safety of his materials and equipment at site including premises with fixtures provided therein.

#### **10. OFFICES, STORES ON THE SITE:**

a) The Contractor shall be allowed to provide separate site office for his staff for all necessary stores on site in a specified area for all materials such as timber, cement and other such materials, which are likely to deteriorate by the action of sub, rain and the due to exposure, in such a manner that all such materials shall be protected from damage by weather or any other cause. All such stores and offices shall be cleared away and the ground left, in good and proper order on completion of this contract.

b) All materials which are stored on site such as bricks, timber, plywood, boards, metal, sand etc. shall be stacked in such a manner as to facilitate rapid easy checking of quantities of such materials.

c) The safety and security of all materials brought at site shall be the sole responsibility of the Contractor. The materials against which an advance has been paid by the owner shall be carefully stored at site by the contractor. They shall not be removed from the site without the written permission of the Owner and shall be used in the contract workonly.

#### **11. NOTICES:**

The Contractor shall give all notices and pay all fees and shall comply with all acts and regulations for the successful completion of the contract works, as per the rules and regulations of appropriate authorities.

#### **12. FACILITIES TO OTHER CONTRACTORS:**

The contractors shall give full facilities and co-operation to all other Contractors working at site, if any, as directed by the Architect and shall so arrange this program of work as not hinder the progress of other works. The decision of the Architect on any point of dispute between the various contractors shall be final and binding onall parties concerned.

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**13. PREPARATION OF BUILDING WORKS IN OCCUPATION & USE ON COMPLETION:**

On completion of the work, the contractor shall inform the Architect in writing that he has finished the work and it is ready for the Architect's inspection. The Contractor shall oil if necessary of all hardware, inside and outside, all floors, staircases and every part of the building. He will leave the entire building neat and clean ready for occupation in all respects and to the entire satisfaction of the Architect and Owner.

**14. CLEARING OF SITE OF WORKS:**

The contractor shall clear the site of works as per the instructions of the Architect. The site works shall be cleaned of all materials sheds etc., belonging to the Contractor. The site shall be delivered in a clean and neat condition as required by the Architect within a period of one week after the job is completed. In case of failure by the Contractor, the Employer will have to get the site cleaned at the risk and costs of the Contractor.

**16. WORKS EXECUTED BEYOND NORMAL WORKING HOURS:**

If the contractor engages workmen to work beyond normal working hours, he shall do so with the prior approval of Architect and provide and maintain at his own cost sufficient lights to enable the work to proceed satisfactorily without any danger. Approaches to the site of work also shall be sufficiently lighted by the Contractor. No extra cost claim would be entertained for the above.

**16. WORK ON HOLIDAYS /SUNDAYS:**

The Contractor workmen may be allowed to work on Sundays/Holidays subject to the prior permission of the same by the Employer. No extra cost claim would be entertained for the above.

**17. SPECIFICATIONS:**

All work shall be carried out as described in the tender item and with the C.P.W.D. Specifications laid therein, unless otherwise stated. If not covered as above, I.S. codes specifications shall be followed in that order. For patented products, the manufacturer's specifications and instruction shall be followed. For any discrepancy in various specifications, Architect's decision shall be final and binding on both the parties. In case there are no laid down specifications. Architects specifications and instructions for that particular item shall be followed.

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

The contractor shall assist in taking the measurements by the Architect's representatives, before covering up or otherwise placing beyond there each of measurements any, item of work. Should the contractor neglect to do so the same shall be uncovered at the Contractor's expense and if found to be executed in default of specifications/requirements, no payment or allowance shall be made for such work and Contractor shall have to remove and re-do the same at his own cost.

**19. DIMENSIONS:**

Figured dimensions in all cases shall be accepted in preference to scaled size. Large-scale details shall take precedence over small-scale drawing. In case of discrepancy, the contractor shall seek the clarifications from the Architects before proceeding with the work.

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**20. TESTING OF WORKS AND MATERIALS:**

The Contractor shall be required by the Architect arrange to test materials and portions of the works at his own cost in order to prove their soundness and efficiency. These tests should be carried out at the approved Institutions as directed. If after such test the work or portions as of the works are found to be defective or unsound the Contractor shall if ordered by the Architect pull down and re erect the same at his own cost.

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

The Contractor shall submit to the Architect every week as per the Performa; -

- a) Detailed industrial statistics regarding the labour employed by him daily.
- b) The list of technically qualified persons employed by him for the execution of the work.
- c) The total quantity and quality of materials used for the works and supplied to site.
- d) A weekly progress report.
- e) Special incidents at site, if any.
- f) Whether the work is progressing according to Schedule. If not, what are the hitches and the remedial measures.

**22. TYPOGRAPHIC OR CLERICAL ERRORS:**

The Architects clarifications regarding partially omitted particulars or typographical or clerical errors shall be final and binding on the Contractor.

**23. PROGRAMME:**

The time schedule for carrying out the work stage by stage, in the stipulated time shall be drawn by the Architects in consultation with the Employer and the Contractor. The Contractor shall follow strictly the approved time schedule, incorporating change, if any, with the approval of the Architect to ensure the completion of the work in stipulated time. A graph or chart on work shall be maintained showing the progress periodically. The contractor shall submit to the Employer a weekly progress report stating the number of skilled and Unskilled labourers employed on the works, working hours done quantity of cement used, place, type and quantity of work done during the period.

The Contractor must inform the Architect 10 days in advance of all working drawings and details required 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 Architect with due approval from the employer may take suitable action as deemed fit without prejudice to any terms and conditions of this contract.

**24. VARIATION:**

Quantities mentioned in the Schedule of Quantities included in the contract are subject to any variation as per actual site conditions and as directed by the Architect for the scope of work. No compensation shall be payable to the Contractor on this account.

**25. BRICKS:**

Ordinary bricks used in the work shall be kiln burnt first quality locally available bricks, as approved by the Architect.

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**26. CEMENT:**

Cement will be procured by the Contractor in the open market of approved first quality and stacked in a proper way at site so that it does not get damaged or spoiled. He will maintain proper record of cement received at site and consumed daily to the satisfaction of the Architect.

**27. APPROVAL OF MATERIALS BY ARCHITECTS:**

Wherever "Approved Materials" are mentioned in the Contract, the Contractor shall get the same approved by the Architect in consultation with the employer prior to its use. The contractor shall keep one set of sample of materials approved by the Architect for its ready reference with the Architect at site of work and shall ensure that the materials incorporated in the works strictly conform to the sample approved already.

All other materials for use in the work shall be got approved by the Architect before placing order / procurement.

**28. WATER:**

Water shall be made available to the Contractor free of cost at a point each floor of the premises and the Contractor shall have to make his own arrangements for carriage / storage of water.

**The recovery for water charges shall be affected as per the rates paid by the Employers to the Water Supply Co. from time to time, from his payments due or @ 0.25% of the project cost.**

**29. ELECTRICITY:**

The Employer shall make available electricity at the site of work to the Contractor.

Temporary light points required in working area will be provided by the Contractor at his own cost in consultation with the Architect at site. The tender rates shall be quoted accordingly by the contractor.

**The recovery for electricity shall be affected as per the rates paid by the Employers to the Electricity Supply Co. from time to time, from his payments due or @ 0.75% of the project cost.**

**30. INCOME TAX: (TDS)**

Income tax at source will be deducted as per rules on all payments made to the Contractors.

**31. STATUTORY REGULATIONS:**

The whole of the work including electrical / plumbing / sanitation is to be complied with as per the requirements and byelaws of the relevant statutory authorities.

**32. WORKMANSHIP:**

Quality of materials and workmanship shall conform strictly to tender specifications and Contractor will ensure that the quality of work is appropriate to the specifications and the work is done to the satisfaction of the Architect with strict control on the materials, workmanship and supervision.

**33. ESCALATION:**

The rates quoted in the tender shall be firm and shall not be subject to any escalation till the completion of work due to increase in the prices of materials, labour wages sales Tax etc. for any reasons, whatsoever.

**34. ELECTRICIAN:**

The contractor shall maintain at site-licensed electrician to ensure that the electrical work is earned out properly and no accident takes place. The electrician will work in close coordination with the Architect.

**35. PROVIDENT FUND AND E.S.I.S.:**

The contractor shall bear full liability for payments under provident fund and employees State Insurance Scheme and other labour laws for his workers and staff.

**36. MOCK UP DRAWINGS:**

The contractor shall bear full cost for one mock up drawings to be done in 30 days .These mock up drawings are to be approved by the architect. All furniture shop drawings, electrical drawings, route drawings and furniture samples to be got approved from the architect before execution. After completion of work the contractor has to submit three sets of hard copy and one set of soft copy in autocad of electrical route drawings, position for maintenance purpose, the cost of above to be included in the tender of respective items.

## SPECIAL CONDITIONS OF CONTRACT FOR AC WORK

### AIR-CONDITIONING WORK

- 1.0 Work shall be done as per CPWD and ISI Specifications for air-conditioning 1977 amended upto date .
- i) In the event of any discrepancy between the Specifications as mentioned under Technical Specifications and as given in the Specifications as mentioned above. The specifications under Technical specifications shall prevail.
  - ii) The relevant latest IS Specifications, Codes of Practice shall be followed if the Specifications for the item is not available in the Specifications as mentioned above or in Technical Specifications in the agreement.
  - iii) In case of any discrepancy, the decision of the Architect shall be final and binding.

### 1.1 SHOP DRAWINGS

The successful bidder shall have to submit all shop drawings within 7 days in stages from the date of issue of letter of intent to the Consultant for approval.

The list of shop drawings shall be as follows:

- a) Detailed layout plans for each area.
  - b) Refrigerant Piping routes.
  - c) Electrical panel and control scheme.
  - d) Any other detailed drawings required for the system.
  - e) Condenser/Evaporative unit location.
  - f) Foundation Details.
- 1.2 Each tender should be signed by the person having the power of attorney to sign. Bill of quantities should be signed and returned. If the tender is made by or on behalf of a Company incorporated under the Companies Act of 1956, it shall be signed by its Executive, authorized to sign or on their behalf shall bear the official seal of the Company and accompanied by a Photostat copy of Power of Attorney. If the tender is made by an individual, it shall be signed with his full name and address, if made by a Firm, it shall be signed under the partnership of the Company name by a Member of the Firm, who shall sign his own name and give the name and address of each Partner / Directors of the Firm and attach the copy of the Power of Attorney with the tender.
- 1.3. The contractor must acquaint / acquire themselves with the site conditions, means of access to the work, local conditions and all matters pertaining thereto. It shall be the contractor's responsibility to obtain all necessary information required for quoting the above tender and for entering into a contract. The detailed drawings and specifications available with the document / with the owner must be studied and examined carefully by the bidders before submitting their offers. This site is finished with all light fixtures, fittings and False ceiling and is ready to move in. The contractor should take good care of these, while installing his equipment. Any damage to fixtures, fittings, False ceiling, Painting of the walls etc. shall have to be rectified by contractor at his own cost and contractor is to hand over the building in the same condition.
- 1.4. The successful bidder shall prepare required number of copies, as desired by the owner/consultant (duly bound) of agreement on a stamp paper within two weeks from the date of approval of draft copy of agreement by the owner.
- The following documents shall generally constitute the contract agreement:
- a) Invitation to tenders.
  - b) Special conditions of contract, tender documents and drawings.
  - c) Complete correspondence with the successful bidder and owner shall be consolidated in one letter by the bidder.
  - d) Any other document necessary for completion of contract agreement.

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- 1.6. The bidders shall submit along with their tender a list of few important jobs giving date of order, year of completion/ commissioning of HVAC, approximate delay in completion/ commissioning of jobs, reasons of delay by them within last three years.
- 1.7. The rates quoted in the tender shall include all charges for civil, scaffolding, hiring charges for any tools/ equipments etc., required for execution of the contract. The rates shall be inclusive of excise duty, sales tax, octroi or any other duties or fees levied by Govt. or any Public or Local Bodies. The assessable value, quantum/ rate of excise duty included on each excisable equipment should be indicated separately in the price bid.

The quoted rates shall be on works contract basis and subject to statutory variation in sales tax on work contract or on rate of excise duty. In case assessable values are increased by the manufacturer during the currency of contract, the client shall not pay any increase in quantum of excise duty on account of change of accessible value. No foreign exchange and license shall be arranged by the owner in case of imported items, material or equipment.

- 1.8. Calculations made by the contractors should be based upon probable quantities of the several items of work, which are furnished for their convenience in the 'Bill of Quantities'. It must be clearly understood that quantities are liable to alteration, by omission, deletion or additions at the discretion of the owner. The detailed bill of quantities is given for the guidance of the contractor only.

It shall be contractor's full responsibility to check and ascertain the correct quantities and quote accordingly. The contract shall be on works contract basis and the owner reserves the right to add / delete any items of work during the currency of contract.

1.9. **BAR CHART AND CASH FLOW CHART**

The contractor shall prepare a bar chart and cash-flow chart in consultation with the owner and shall strictly adhere to the same. The progress and the completion of the work shall be in accordance with the bar chart and will form part of the agreement. The said schedule of work/ bar chart will be subject to conditions of contract related to extension of time.

1.10. **SUB-CONTRACTORS**

The successful contractor shall take written consent from the owner before appointing any sub-contractor, however, the total responsibility of the job conforming to specifications carried out by sub-contractors shall be owned by the contractor.

1.11. **PERFORMANCE BOUND CONTRACT**

The contract will be a performance bound contract and therefore the tenderers shall make their independent checks for heat loads, selection of equipments etc. Capacities of various equipments specified in the tender documents are tentative and minimum acceptable. The drawings, if enclosed with the tender documents, shall be tentative and for tendering purpose only.

1.12. **TRAINING OF PERSONNEL**

The contractor shall impart training to the owner's appointed staff free of cost during erection and commissioning of HVAC at site.

1.14. **GUARANTEE**

The contractor shall guarantee the performance of complete air-conditioning system for a minimum period of 12 months from the date of virtual completion. The tenderer shall guarantee the air-conditioning system to maintain space conditions, as mentioned in the tender documents. Tenderers shall also guarantee the performance of various equipments individual and jointly. The same shall not be less than 3% of the specified ratings when working under operating conditions for the complete installation. In case the A.C cannot be commissioned due to reasons not attributable to the contractor, a bank guarantee of suitable amount, as agreed by the owner, shall be furnished by the contractor and payment due against commissioning shall be released thereafter. However, the

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commissioning of the A.C shall be done by the contractor and all tests at site shall be conducted as per tender documents. During guarantee period, loss of refrigerant and oil, if any, shall be borne by the contractor. The capacity/ ratings of various equipments in this contract given are minimum acceptable and for guidance purpose only. In case of short-fall, the contractor shall replace / modify equipments for achieving desired parameters without any extra cost to owners or employer

#### 1.15. TESTING EQUIPMENTS

The A.C units shall be inspected by the consultant at the manufacturer's works prior to dispatch. All expenses towards the above pre dispatch inspection shall be borne by the contractor and quoted price should include the same.

All testing equipments, tools, scaffolding and ladder etc. that may be required for taking measurements or testing shall be arranged and supplied by the contractor at his own cost.

#### 1.16. REPAIR / REPLACEMENT OF PARTS DURING GUARANTEE

Any defects or other faults which may appear within defects liability, guarantee period of 12 months from the date of handing over of the A.C (except for normal wear and tear) arising in A.C units for material or workmanship not in accordance with the contract shall be borne by the contractor.

- 1.17. All entries should be filled in English only made by hand clearly written in ink. All corrections should be initialed by bidders as many times as the corrections occur.
- 1.18. All rates should be filled in figures and sub-totals and grand-totals in figures and words both.
- 1.19. On tender scrutiny, if differences are found in rates given by the bidder in words and figures or in sub-total, grand-total amount is found, the procedure for deriving the final value shall be as follows:
- a) The item rates quoted by bidder shall be taken as correct in cases where amount worked out of any item does not correspond to the rate written in figures or words.
  - b) For items not quoted by the bidder, the highest rates quoted by other bidder shall be taken as correct for such item for loading purposes and lowest rates for execution purposes.
- 1.20. Bids not submitted on prescribed form are liable to be rejected. Bidders are advised to quote offer as per bill of quantities. No alternate offer is acceptable. Any alteration/ cutting/ additions made in the tender documents shall lead to disqualification of the bid without any prejudice.
- 1.21. Any comments on technical or commercial conditions should be done clause wise.
- 1.22. The acceptance of bid shall be intimated to the successful bidder through an award letter and thereafter formal agreement shall be entered within the time specified in the award letter.
- 1.23. The owner shall deduct TDS at source as applicable or statutory deductions if any to be made at source and certificate against deductions shall be given to the contractor by the owner.

#### 1.24. POWER AND WATER SUPPLY FOR ERECTION PURPOSES

The owner shall provide power and water required for erection, testing and commissioning purposes at one point at site and contractor shall make his own arrangements for extending to locations where power and water will be required by him.

#### 1.25. STORAGE AT SITE

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Space if available, can be used by the contractor for storage of equipments/ materials brought to site for execution of the work. However, watch and ward of the same shall be at contractor's risk.

**LIST OF APPROVED MATERIALS FOR INTERIOR, PLUMBING, CIVIL  
& ELECTRICAL WORKS**  
(SAMPLES TO BE CHECKED AT CONTRACTOR'S COST)

S.NO.	ITEM	APPROVED MAKE/BRAND
1.	HARDWARE FITTINGS	HETTICH/ HAFELE
2.	PREMIUM / GENERAL LAMINATES (1.0 MM THICK)	FORMICA / MERINO LAM / SUNMICA (BY AICA) / GREENLAM
3.	CYLINDRICAL LOCKS	GODREJ / DOORSET / GOLDEN
4.	DOOR CLOSERS	DORMA / OZONE / DOORSET
5.	GLASS	SAINT GOBAIN / MODI FLOAT / INDO ASHAI
6.	PLY BOARD / MARINE PLY	CENTURYPLY / KITPLY / GREENPLY / SARDA PLY
7.	COMMERCIAL BOARDS	CENTURYPLY / KITPLY / GREENPLY / SARDA PLY
8.	ANTI-TERMITE / FIRE RETARDANT PAINT	VIPER / NAVAIR / UGAM / DC333 / FYRETARD AAAA
9.	GLUE	FEVICOL
10.	POLISH	MRF / ASIAN PAINTS / NEROLAC / MELAMINE POLISH AS PER APPROVED BY THE ARCHITECT
11.	CERAMIC TILES / VITRIFIED HOMOGENEOUS GLAZED TILES.	KAJARIA / NITCO / HR JOHNSON / SOMANY / MARBONITE
12.	KITCHEN SINK	NIRALI / NEELKANTH / FUTURA / AMC / DIAMOND
13.	SANITARY FIXTURES	JAQUAR / PARRYWARE / HINDWARE
14.	C.I PIPE	NECO / HEPCO
15.	G.I PIPE	TATA / JINDAL HISSAR / SURYA PRAKASH
16.	PVC PIPE	PRINCE / SUPREME / FINOLEX
17.	BENDS	UNIK / R BRAND / ZOLOTO / BIC / NECO / HEPCO
18.	NAHANI TRAP	NECO / HEPCO
19.	KITCHEN UTENSILS RACK	MAHARAJA / VPSK
20.	PAINTS / DISTEMPER / ACRYLIC / ENAMEL / PLASTIC PAINT	ASIAN / ICI / NEROLAC / BERGER
21.	MS. PIPES / PLATES / FLATS / ANGLE	SAIL / HSL / TATA / VSP
22.	CEMENT	ACC / JK / BIRLA / ULTRA TECH / L&T / GUJARAT AMBUJA
23.	UPVC WINDOWS / DOORS	FENESTA / ALUPLAST / LINGEL / SHUCO / WINPRO / REHAU / LG
24.	SWITCH, / SOCKETS (MODULAR TYPE) AND ITS PLATE AND BOXES	ANCHOR/ ROMA/ LEGRAND (MOSIAC) / MK (WRAP ROUND)/ CRABTREE ATHENA
25.	MS CONDUIT (ISI MARK)	BEC / STEEL KRAFT / AKG / ATUL
26.	LIGHTING FIXTURES	PHILIPS / LUMOUS / HAVELLS
27.	MCCB	MDS / SCHNEIDER / GE / L&T / HAGER
28.	MCB / MCBDB	MDS / SCHNEIDER / GE / L&T / HAGER
29.	ELECTRICAL WIRES / CABLES	FINOLEX / GRANDLAY / POLYCAB
30.	DISTRIBUTION BOARDS WITH	LEGRAND / SCHNEIDER / HAGER

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	MINIATURE CIRCUIT BREAKERS, ELCB	
31.	TELEPHONE CABLE	DELTON / KEI / POLYCAB
32.	CO-AXIAL CABLE FOR TV	KEI / POLYCAB / D-LINK
33.	TELEPHONE TAG BLOCK	KRONE / TVS R&M
34.	PVC CONDUIT	BEC / AKG / POLYCAB
35.	LV SYSTEM WIRE (CAT 6)	AMP / SYSTEMAX
36.	TELEPHONE / DATA OUTLET	AMP / SYSTEMAX
37.	GLASS FOR DOORS / WINDOWS	MODI FLOAT / EMIRATES / SAINT GOBAIN / ASAHI / SEJAL
<b>SCHEDULE OF APPROVED MAKES FOR AC WORKS</b>		
	<b>HI-WALL &amp; CASSETTE SPLITS</b>	VOLTAS/LG/CARRIER
	VOLTAGE STABILIZERS	LOGICSTAT / MICEL/BLUE BIRD
	Copper Pipes	MET / DIAMOND/ OHTC ( Imported )
	PVC PIPE ( 20 Kg density )	POLY PACK / SETIA
	Power Cables	Phenolex / Kalinga
	Control Cable	Phenolex/Kalinga
	CONDUIT for Elect. Wires	AKG / Marshal / Plaza
	M.C.B.	MDS / SCHNEIDER / GE / L&T / HAGER

**TECHNICAL SPECIFICATION**

**ADDITIONAL SPECIAL CONDITIONS OF CONTRACT :**

1. The contractor shall take the responsibility of dismantling and disposal of existing civil, electrical and furniture work to the destination specified by the owner.
2. All electrical fixtures, equipment should be removed so as to be serviceable and handed over to the owners and these fittings and fixtures shall be the property of NIPFP.
3. The contractor shall take responsibility of getting approval of Building Authorities / Estate Officer and other Authority as required for executing the work during and off the office timings.
4. On partial completion of work the contractor shall be furnished with a certificate, but not such certificate be given nor shall the work be considered to complete until the contractor shall have removed from the area of the premises ( to be distinctly marked by the Architect/ The Secretary (NIPFP) in the site plan which, the work shall be executed) all scaffoldings, surplus materials and rubbish and clean the dirt from all wood work, doors, windows, walls, floors or other parts of any building, in or upon which the work is to executed, or of which he may have had in possession for the purpose of the execution hereof. If the contractor shall fail to comply with the requirements of the clause as to the removal of scaffoldings, surplus materials and rubbish and cleaning off dirt on or before the date fixed for the completion of the work, the architect may at the expense of the contractor remove such scaffolding, surplus materials, and the contractor shall forthwith pay the amount of all expense so incurred, and shall have no claim in respect of any such scaffolding or surplus materials aforesaid, except for any actually realized by the sale thereof.

**5. SELECTION OF MATERIALS**

On unavailability of any material in the list of approved materials for interior works, for any reason whatsoever may be, the Architects in consultation with NIPFP may permit the contractor to use the equivalent material.

6. In an event, the contractor fails to procure approval from statutory Authorities if needed by municipal authorities , as mentioned above/ otherwise required, the work shall not be deemed to be completed and 50% of the EMD payment due to the contractor shall stand forfeited.

## **TECHNICAL SPECIFICATIONS**

### **I. GENERAL**

The measurement of the works executed shall be as per IS-1200 (latest) or as given along with the item.

This specifications is for work to be done, items to be supplied and materials to be used in the works as shown and defined in the drawings and described herein, all as specified and to the entire satisfaction of the Architect.

The workmanship is be of highest standards. Use of specialised tradesmen in all respects of the work, and allowance must be made in the rates for so doing.

The materials and items to be provided by the Contractor shall be the best of their respective kinds as approved by the Architect and in accordance with any samples which may be submitted for approval and in accordance with the specifications. Where materials or products are specified in this specification and/or bill of quantities by the name of the manufacturer or the brand, trade name of catalogue reference, the contractor will be required to obtain the approval of the Architect before using the materials and also produce all invoices, vouchers or receipted accounts for any materials if called upon to do so by the Architect. Samples of all materials are to be submitted to the Architect for their approval before the contractor orders or delivers in bulk to the site, samples, together with their packings, are to be provided free of charge by the contractor and should any materials be rejected they will be removed from the site of work at the contractor's own expense. All samples will be retained by the Architect for comparison with materials which will be delivered at site subsequently. Also, the contractor will be required to submit specimen finished of colours, fabrics, etc., for the approval of the Architect before proceeding with the works.

### **1.0 TEAK WOOD / CEDAR WOOD / EUROPEAN STEEM BEECH**

The teak wood should be of the best quality available in India such as ivory coast teak wood It should be free from saps, knots, warps, cracks and other defects. All woodwork shall be planned neatly and truly finished to the exact dimensions. All joints shall be neat and strong, truly and accurately fitted and glued before being fitted together. All exposed wood shall be melamine polished and should be of 1st quality.

**1.1** Timber is to be of the best of its kind, properly seasoned, of mature growth free from wormholes, saps, wraps, cracks and other defects.

### **2.0 PLYWOOD**

Plywood should be equal or superior quality as laid down in is 303-1989 premium quality, resin bonded, weather proof, close grained suitable for veneering, painting, polishing or bonding plastic laminate.

A “strip of solid ivory coast teak wood wood glued or detailed as shown in Architect’s drawings shall lip exposed edges of plywood. The thickness shall be as mentioned in the drawings. The contractor shall obtain the approval for the preference of the brand name from the Architect as per the approved list.

The samples collected randomly cut from each of the boards selected shall be subjected to the tests specified as under:

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a) Glue Adhesion: Plywood when tested in accordance with IS 1734 (Part 4): 1983 shall have an average and a minimum individual shear strength not less than as specified in the respective IS code.

b) Water Resistant test: The plywood when tested in accordance with IS 1734 (Part 6): 1983 shall have an average and min. individual shear strength not less than as specified in the respective IS code.

c) Moisture Content test: The plywood when tested in accordance with IS 1734 (Part 1) L 1983 shall have a moisture content not less than 5% and not more than 15%.

d) Procedure of Edge Straightness: The straightness of the edges and ends of plywood shall be verified against a straightedge not less than the full length of the plywood. If the edges on the end of the plywood is convex, it shall be held against the straightedge in such a way as to give approx. equal gap at each end. The largest gap between the straight edge and the edge shall be measured to the nearest millimeter and record.

e) Procedure for square ness: The square ness of plywood shall be checked with a 1200mm x 1200mm square, by applying one arm of the square to the plywood. The maximum width of the gap shall be recorded.

Each plywood shall be legibly and indelibly marked or stamped with the following:

Indication of the source of manufacture Year of manufacture  
Batch No. and type of grade.

### **3.0 LAMINATE**

Laminate shall be of the brand, catalogue surface finish, colour as specified and approved by the Employer/Employer. Plastic laminates must not be applied to timber with moisture content of more than 12% and a temperature of less than 6 degree C. The bonding agent shall be an approved adhesive, used in strict accordance with the manufacturer's instructions. Rubber based adhesives shall in no case be used.

### **4.0 NAILS, SPIKES & BOLTS**

Nails, spikes and bolts shall be of the best quality galvanized mild steel or wrought iron and of lengths and weights approved by the Architect. Nails shall comply with IS 1959-1960 or equivalent approved quality sample. Bolts heads nails are comply with B.S. 1494. Brass screws where specified shall comply with B.S. 1210. Wire staples shall comply with B.S. 1494 or equivalent. The contact surfaces of dowels, tenons, wedges etc., shall be glued with an adhesive complying with the requirements of one of the following I.S. Specifications or such approved adhesive, C.P. brass/steel screws of Nettle fold make.

### **5.0 GLUE**

Where glued joinery and carpentry work is likely to come into contact with moisture, the glue shall be waterproof. The use of animal glues will not be permitted.

### **6.0 TIMBER**

Timber is to be cut to the required sizes and lengths as soon as practicable after the works are begun and stored under cover, so that the air circulates freely around it. Any portions that warps or develops shakes or other defects thereafter, are to be framed and finished in a proper and workman like manner. In accordance with the detailed drawings, weight where required and fitted with all necessary metal ties, bolts, screws, etc.

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Templates, boxes and moulds shall be accurately set out rigidly constructed so as to remain accurate during the time they are in use.

Timber shall be wrought on all sides, free from large knots, splayed as required. plugged and fixed to walls, etc. at 1'-6" centers with G.I. screws and fasteners.

Wood plugs are to be cut on the twist. Patent wall plugs or plastic filling may be used in lieu of wood plugs with the approval of the Architect.

The counters, shelving etc. shall be constructed of plywood as described and specified, properly housed, grooved, tongued, glued, blocked and screwed together, and entirely to the satisfaction of the Architect.

## 7.0 JOINERY

**Joinery is to prepared immediately after the placing of the-contract, framed up, bonded and wedged up. Any portions that warp or develop shakes or other defects are to be replaced before wedging up.**

The entire work is to be framed and finished in a proper and workman like manner, in accordance with the detailed drawings, and fitted with all necessary metal ties, straps, bells, screws, glue etc. as required. Running bonded joints are to be cross tongued with teak/cedar tongues and where over 1" thick, double cross tongued with teak/cedar tongues. Joiner's work generally is to be finished with fine glass prepared surfaces unless otherwise specified. Should joints in joiner's work open, or other defects arise within the period stated for defects liability period in the contract, and the cause thereof be deemed by the Architect to be due to unseasoned timber or faulty or bad workmanship, such defective joinery shall be taken down, refitted, redecorated and/or replaced if necessary and any work disturbed shall be made good at the Contractor's expense. The Contractor shall be responsible for providing and maintaining any boxing or other temporary coverings required for the protection of dressed or finished work if left unprotected till the final handover. Contractor is to clean out all shaving, cut ends and other waste from all parts of the works before coverings or in fillings are constructed.

The hardware throughout shall be of approved manufacturer and brand name, well made and equal in every respect to the samples to be deposited with the Architect. The contractor may be required to produce and provide samples from many different sources before the Architect are able to make a decision and the contractor should allow in his rates for doing so.

Aluminum fittings shall have powder coated satin chrome or anodised finish, of 20-22 micron (min.) thickness unless otherwise specified and shall be suitable for their intended purposes.

Screws are to match the finish of the article to be fixed, and to be round or flat headed or countersunk as required.

Cover up and protect the brass and bronze surface with a thick grease or other suitable protective material, renew as necessary and subsequently clean off and clear away on completion.

## 8.0 GLAZIER

All glass to be of approved manufacture complying with IS 3548 -1966 or as per approved quality and sample, to be of the qualities specified and free from bubbles, smoke waves, air holes and other defects.

Polished plate glass shall be 'glazing glass' (G.G.) quality. That for mirrors shall be 'Silvering quality' (S.Q.) conforming to IS 3438-1965 or as per approved samples and quality.

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The compound for fixing glazing to metal is to be a special non-hardening compound manufactured for the purpose and of a brand and quality approved by the Architect.

In Cutting glass, proper allowance be made for expansion. Each square of glazing to be in one whole shoot.

On completion, clean all glass inside and out, replace all cracked, scratched or broken panes and leave in good condition to the satisfaction of the Architect.

For any location the largest possible size of glass is to be used i.e. with minimum joints, unless otherwise mentioned in the drawings. Location of joints in glass are to be to the entire satisfaction of Architect.

## **9.0 PAINT AND POLISHING**

All material required for the works shall be of specified and approved manufacture, delivered to the site in the manufacturer's containers with the seals, etc., unbroken and are to be clearly marked with the manufacturer's name or trademark with a description of the contents and colour. All materials are to be stored on the site to the works.

Spray painting with approved machines will be permitted only if written approval has been obtained from the Architect prior to painting. No spraying will be permitted in the case of priming coats nor where the soiling of adjacent surface is Likely to occur.

The nozzle and pressure to be so operated as to give an even coating throughout to the satisfaction of the Architect. The paint used for spraying is to comply with the specifications concerned and is to be specifically prepared by the manufacturer for spraying. Thinning of paint made for brushing will not be allowed.

## **10.0 WOOD PRESERVATIVE:**

All unexposed surface of timber framing; backs of door frames, cup board framing, grounds etc. are to be treated with salignum or other equal approved impregnating wood preservative. All woodwork is also to be treated with fire retardant paint and antitermite treatment.

All brushes, tools, pots, kettles etc. used in carrying out the work shall be clean and free from foreign matter and are to be thoroughly cleaned out before being used with a different type or shade of material.

All iron or steel surface shall be thoroughly scrapped and rubbed down with wire brushes and shall be entirely free from rust, mill scale, etc. before applying the priming coat.

Surfaces of new woodwork, which shall be painted, are to be cleaned down, knotted and stopped for the approval of the Architect.

Surfaces of new woodwork which shall be painted are to be cleaned down to remove dirt, grease etc. Minor areas of defective paint shall be removed by scraping back to a firm edge and the exposed surface toughed in with primer as described and stopped with putty.

Where woodwork has been previously painted or polished and is to be newly polished, the existing finish shall be completely removed by scraping, burning off or rubbing down as required.

Surfaces of previously painted metal which shall be painted are to be cleaned down and flatted down as described in surfaces of previously painted woodwork. Minor areas of defective paint and rust and loose scale shall be removed completely by chipping, scraping and wire brushing back to the bare metal and toughed in with primer as described.

## **GENERAL SPECIFICATION**

### **GENERAL**

The Contractor is advised to study all the drawings in details including the intent of the design. All clarifications necessary should be sought by the Contractors, prior to filling in the tender.

All the work shall be carried out in best workmanship like manner and wherever, specifications for any item are not given, the relevant Indian Standard Institution specifications shall be applicable.

Generally, the make as approved in the list of approved makes and materials shall be insisted upon, except for any reason valid and appropriate in the opinion of both Architect and Employer. No. Extra cost is liable to be entertained for any variations in the basic cost of material.

### **MATERIAS**

Ply/Block Board to be Phenol Formaldehyde bonded, (Boiling Water resistant) as per respective Indian Standard. BIS No. 303: 1989.

All commercial ply or block board shall be as per preferred make. All exposed ply block board edges shall have lipping of as directed.

When ply/teak board is used for panelling, partitions, furniture etc. the same shall be of straight matching grains only. (Group Match to 6 ply)

### **SCREWS**

All screws shall be of best quality chromium plated brass or steel screws of nettle fold make.

### **PROCEDURE OF WORK**

The contractor shall arrange the operations that are convened and agreed to ply the Architect. He shall adhere to the time schedule presented by him and agreed to by the Architect and shall complete ail works allotted to him in time, giving best workmanship to construction/manufacturing jobs to the entire satisfaction of the Architect.

### **BUILT IN JOINERY**

Where joinery work is specified to be built-in, it shall be the responsibility of t h e contractor to ensure that the joinery works are set in plumb and true in Sine and shall not be damaged or displaced by subsequent operations.

### **PROTECTION OF WORK**

The contractor shall he responsible for the temporary erection of doors a n d closing of openings necessary for the protection of the work during progress. He shall also provide a n d m aint ain a n y o t h e r temporary covering required for the protection of finished / unfinished wood work that may be damaged during the progress of the work if left unprotected and at his own expenses.

### **MAKE GOOD DEFECTIVE WORK**

The contractor shall be responsible for the shrinkage or warping or any other defects, which may appear in any joinery work. All deductive damaged work shall be taken down and renewed or repaired to the satisfaction of the Architect without any extra charges.

### **FURNITURE**

All furniture shall he in accordance with the drawings and the sample piece as approved by the Architect. The Contractors shall first prepare a sample piece and the same shall

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be got approved from the Employers to their entire satisfaction. The contractor will be expected to do all the modifications to the sample for which no claim will be entertained. Glue used shall be superior synthetic quality such as Fevicol etc. Wherever mitred joint are used, dovetailing shall be introduced.

## **BRICK WORK**

Bricks shall be of class designation - 75 of standard specifications as per approved sample and shall be laid in 1:3 cement sand mortar (1 cement & 3 coarse sand.) Cement to be used shall be of approved make and sand shall be sharp, clean, free from organic and foreign matters. Bricks shall be fully soaked in clear water for a period of 12 hrs. prior to use. Bricks shall be well-bonded and laid in true level and plumb. Mortar joints shall not exceed 6mm in thickness and joints shall be fully filled with mortar. All joints should be raked and faces of wall cleaned at the end of each day's work. The brickwork shall be kept wet for atleast 10 days after laying.

## **PLASTERING**

Joints of brickwork shall be raked out to a depth of 18mm and the surface of the wall shall be washed and kept wet for two days before plastering. The cement, plaster shall be of 1:4 (1 cement: 4 coarse sand) proportion of 12mm thickness to be applied in three coats finished to true smooth and uniform surface by float and trowel. The work shall be tested frequently with a straight edge and plumb Curing shall be started as soon as the plaster has hardened sufficiently not to be damaged when watered. The plaster shall be kept wet for atleast 10 days. Any defective plaster shall be cut out in rectangular shape and replaced.

## **FLOORING**

It shall be laid with minimum possible joints with recommended adhesive in required quantity.

## **REJECTION / WASTAGE**

All rejections and wastage in process and in final stages, will be to the contractor's account.

## **PAINTING, OIL/ENAMEL /PLASTIC EMULSION ETC.**

Ready mixed oil paints. flat oil paint, plastic emulsion paint, ready mixed synthetic enamel paint, aluminium paint etc. shall be brought in original containers and in sealed tins. If for any reasons a thinner necessary, the brand and quality of the thinner recommended by the manufacturer or as instructed by the architect shall be used. The surface shall be prepared as specified and a coat of approved primer shall be applied. After 24 hours drying, approved or specified quality paint shall be applied evenly and smoothly. A filler putty coating may be given to give a smooth finish. Each coat shall be allowed to dry out thoroughly and then lightly rubbed down with sand paper and cleaned of dust before the next coat is applied. The number of coats shall be as specified in the item and if the finish of the surface is not uniform additional coat as required shall be applied to get good uniform finish at no extra cost. After completion no hair mark from the brush or clothing of paint, puddles in the corners of panels, endless of the moulding etc. shall be cleaned off from stains. When the final coat is applied the surface shall be roiled with a roller or textured to a special texture finish as approved by the architect as per sample to be prepared before start, of work.

Spectrum spray coat plaster/paint to be applied over the prepared surface i.e. finished in POP. The coat to be applied as per the specification of the manufacturers.

Primer of following materials to be applied:

a) Wood work: White or pinkwood primer

b) Steel work: Red oxide zinc chromates

Mode of measurement of painting on following material shall be as follows:

a) Wood Work:

For melamine polish on woodwork no separate measurement shall be made. All items of woodwork include the cost of polishing.

b) Walls:

For 2 or more coats of wall emulsion p a i n t (applied w i t h roller) the surface area shall be measured.

c) Steel work:

For 2 or more coats of enamel paint applied with brush. All items inclusive of paint work except existing windows.

d) Dry Distemper : IS 427 : 1965

## PARTICULAR SPECIFICATIONS

1. For all cupboards, wall cabinets, tables credenzas, drawers etc all vertical surfaces exposed to view to have 1.0mm thick laminate, all horizontal top usable surfaces shall have 1mm thick laminate unless otherwise mentioned in the BOQ.
2. All non laminated non-veneered surfaces shall be enamel painted with synthetic enamel paint (two or more coats) in stain of approved shade matching to the exterior finish or of shade and make approved by the Architect after a priming coat and anti termite paint coating. The cost of such painting is deemed to be included in the rate of the item.
3. All unexposed surface of all partition / panelling / wood work / framework to be treated with one coat of approved fire retardant and anti termite paint FR-881 (viper) as per manufacturer's specifications.
4. All loose ends of the commercial/decorative boards etc. shall be sealed with cedar wood lipping of width equivalent to that of the board /ply
5. In case of laminated front shutters surface the lipping shall be left exposed and at right angle junctions and the joints shall be mitered.
6. The cost of all exposed woodwork is deemed to include painting and polishing with melamine to a smooth finish as per specifications.
7. No extra payment for making neat cut outs of any sort for electrical fittings.
8. For all doors anodised adjustable doorstoppers, door closers locks shall be provided with necessary screws and bolts *etc.* of make mentioned in the tender. The cost for the same shall be as specified in bill of Quantities and shall be paid as per relevant item.
9. All cupboards/ storage shutters shall be provided with box hinge / flap hinge / auto closing hinge / glass unless otherwise specified, as per the requirements and instructions of the Employer / Architect along with rubber stoppers, brass ball catchers and brass latches. The cost towards all above is deemed to be included in the item.
10. All drawers shall slide on a pair of side mounted Drawer slides of hettich/haffle make.
11. All drawer units, credenzas shall be provided with Multipurpose, as shown in the drawing.
12. For all storages / drawers etc. handles for opening shall be in built using moulded cedar wood section approx. 32x32mm running along the width of the shutter with edges round unless mentioned specifically in the detailed specification/item.
13. For all cupboards all inside vertical dividers and horizontal shelving shall be made out of 19mm thick commercial block board unless otherwise specified in the bill of quantities.
14. All exposed wood cedar, teak or any other decorative veneer ply, lipping etc. lipping etc. to be finished with melamine polish with stain of approved shade.
15. All iron mongery to be of ISI marked unless specified otherwise.
16. All items shall be including sales tax/royalty / transportation / centering / shuttering etc. No facility for issue of any form whatsoever of any kind will be given.
17. All electrical switches and sockets to be located as per drawing or as instructed by the Architect. The cost of fittings shall be paid in relevant item.
18. The contractor shall be responsible for removing mulba from the site to a place permitted by the Municipal authorities every fifteen days and cleaning the site regularly. Cost of removal of mulba transportation, loading, unloading etc. (up to any lead) is deemed to be included in the relevant item of demolition / construction.

19. Contractors shall prepare the sample of each item as per nomenclature. He should get it approved from the Architect before execution of work Furniture supplied must be strictly in conformity with the samples approved by the Architect.
20. MM Foam used in furniture shall be ISI marked.
21. The working general shall be carried out as per C.P. W. D. specifications (latest) unless otherwise specified in the nomenclature of the individual item or in particular specifications.
22. Before start of work the contractor shall submit the programme of execution of work and get it approved by the Employer / Architect and shall strictly adhere to the same for timely completion of work.
23. Wherever in the Bill of Quantities / Drawing, Commercial block board / Ply has been mentioned, the same shall be taken to mean only Phenol-formaldehyde bonded (BWR-grade) Block board / Ply.
24. The entire work shall be carried out in close co-ordination/ co-operation with all other agencies working in the building and its surroundings. The contractor shall not be entitled to any compensation on account of temporary stoppage of work, if any, due to other construction activities. The contractor is required to stack his material in such a way that all works at site can progress without any difficulty. Nothing extra will be paid on this account.
25. The contractor shall make necessary arrangement for watch and ward and protection against any theft or damage to all the items during their execution and after completion till these are taken over by the Architect. He shall also provide and maintain temporary covering required for the protection of finished items at his own cost and no claim shall be entertained on this account.
26. Any damage to the building, furniture, fittings articles or any existing work caused by the contractor or his workmen during execution of work shall be made good by the contractor at his own cost failing which the same shall be got made good at the cost and, risk of the contractor. The decision of the Architect shall be final in this regard.
27. The contractor shall maintain in good condition all works during execution till completion of entire work.
28. Rejected items / material shall be removed by the contractor within 3 days of rejection at his own cost and nothing extra shall be paid on this account, failing which the same shall be got removed at his cost and risk by the Architect.
29. All wood work shall be 1st class teak / cedar wood, unless otherwise specified in particular item, shall be of good quality, kiln seasoned, free from knots, decay, sap, warping etc. It shall have uniform colour, shade and straight grains.
30. Wherever adhesive is to be used, it shall be phenol formaldehyde synthetic resin confirming to B.W.R. (Boiling water Resistant) type as per Is - 848 - 1974.
31. All the joining work will be glued before the members are joined together with fully threaded screws.
32. The decorative laminated mica sheets/block boards / ply boards shall have joints at the junctions of the two units only or as mentioned in the drg. and no intermediate or other joints shall be permitted.
33. The woodwork shall not be painted or covered with any treatment unit the same is approved by the Architect.
34. The samples of all materials and fittings required for execution of the work shall be got approved from the Architect before execution of the work.
35. At the discretion of Architect samples of all materials so supplied will be got tested from the laboratory approved by Architect. The cost of its packing, handling transportation and cost of testing will be borne by the Contractor. No claims of whatsoever kind on this account shall be entertained.
36. All usable materials from dismantling to be stacked at safe place, jointly measured and to be kept in safe custody / security by the contractor.

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37. In case of any dispute regarding specifications of materials, dimensions, size and shape and brand names of the materials, the decision of the Architect shall be final and binding.
38. Rates quoted are for finished item of size / shape as specified in relevant item and drgs. All incidental charges of any kind including cartage, storage, cutting and wastage etc. shall be borne exclusively by the contractor and nothing extra shall be paid to him on this account.
39. No payment will be made to the contractor for damage caused by rain or other natural calamities during the execution of the work and no claim whatsoever will be entertained on this account. The contractor shall be required to safe guard all the materials against any suchcalamity.
40. Nothing extra shall be paid for making holes walls / RCC members etc. for fixing work and making good the same to restore the original surface of the building.
41. Unless otherwise specified in the Schedule / Bill of quantities the rates tendered by the contractor shall include the cost of all labour, material and other inputs, cartage and lift upto any floor level of the buildings, royalty or any other tax incidental charges involved in complete execution of work and nothing extra shall be payable on this account.
42. The drawings will be read in correlation / conjunction with specification of item and variance if any, shall be brought to the notice of Architect prior to submission of tender by the tenderer(s) or else the decision of the Architect shall be final and binding.

## GENERAL SPECIFICATIONS IN CASE OF FURNITURE

The chairs, tables, etc. shall be constructed of foam rubber, fabric, teak wood/cedar wood as described and specified, properly housed, grooved, tenoned, glued entirely to the satisfaction of the Architect. A prototype sample of all custom-made pieces must be prepared and submitted to the Architect for their approval before proceeding with the work enmass.

**TIMBER:** All Timber used are to be of first quality free from knots, shakes, wormholes and with a moisture content of not more than 12% depending on the climatic conditions prevailing at the site.

**JOINTS:** All joints will be standard mortise and tenon dowel, dovetail, cross halved, and rebated unless otherwise instructed at site by the Employer / Architect Nailed or glued butt joints will not be permitted.

**FASTNERS:** They will match the finish of the hardware item. Nails in a finished surface shall be neatly punched and the hole filled with wood filler matching the finish. Screws in a finished surface will be round head, raised head or sunk (beneath the surface and the hole plugged with matching colour and grain of the wood surface, unless specially detailed).

**PLYWOOD:** Plywood used mainly for the body work in this furniture, shall be closed grained plywood suitable for veneering, painting, or bonding plastic laminate. It will be a resin bonded, waterproof brand and for 'outdoor' furniture standard specification, as described by the Architect. Exposed edges will be finished with ivory coast teak wood lipping tongued and grooved and glued or as detailed.

**HARDWARE:** Hinges, locks, latches etc. on door, shutters shall be as specified, and as far as possible, by the manufacturer specifications. In any variation of this, the quality of the substitute shall be equal to or better than the original specified, and sample should be submitted to the Architect for prior approval.

**METAL:** Where metal legs, frames etc., are used these shall be welded, brazed, bolted or rivetted as required and on finished surfaces welding, brazing and rivetting shall be neatly smoothed so that no evidence of this is apparent on the final finish of the metal, which will be as specified in the drawing.

On all legs, nylon glides or adjustable plastic screws are to be installed as per instruction of the Architect.

**FINISH:** This will be as indicated on the drawing and colour scheme to be finalised by the Architects and materials (timber, plastic laminates, lacquer, paints etc.) must be as specified and no variation will be accepted unless with the prior approval of the Architect.

'Bricks' of cabinets in contact with wall/floor *etc.* where w a l l hung shall he treated with an approved brand of wood preservative (FR - 881 / Viper).

NOTE: This specifications is of a general type only, and must he read in conjunction with the drawing of the particular item. Any thing shown on the drawing, but not in the specification must be complied with, and vice versa, and read with the item of

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work in Schedule of Quantity including notes given therein. Where discrepancy in description / drawing occurs; the decision of the Architect shall be final and binding on both parties.

## **SPECIFICATIONS FOR INTERNAL ELECTRICAL INSTALLATION**

### **SECTION 1. GENERAL AND TECHNICAL**

#### **1. POINT WIRING**

A point (other than a socket outlet point) shall include all work necessary in complete wiring to the following outlets from the controlling switch or MCB. The scope of wiring for a point shall however, include the wiring work necessary in tapping from another point in the same distribution circuit.

- a] Ceiling rose or connector (in the case of points for ceiling / exhaust fan points, prewired light fittings, and call bells).
- b] Ceiling rose (in the case of pendants except stiff pendants).
- c] Back plate (in the case of stiff pendants).
- d] Lamp holder (in the case of goose neck type wall brackets, batten holders and fitting which are not prewired).

Note:- In the case of call bell points the words "from the controlling switch board or MCB" shall be read as "from the ceiling rose meant for connection to bell push".

##### 1.1 Scope

- a] Any special block required for neatly housing the connector in batten wiring system.
- b] Control switch or MCB, as specified.
- c] 3 pin or 6 pin socket, ceiling rose or connector as required. (2 pin and 5 pin socket outlet shall not be permitted)
- d] Connection to ceiling rose, connector, socket outlet, lamp holder, switch etc.

##### 1.2 Point wiring for socket outlet points

- a] The light plug (5A / 6A) point and power (15A / 16A) point wiring shall be measured on linear basis, from the respective tapping points namely, switch box, another socket outlet point, or the sub distribution board as the case may be upto the socket outlet.
- b] The metal / PVC box with cover, switch / MCB, socket outlet and other accessories shall be measured and paid as separate item.

Note:- There shall normally be no "on the board" light plug point.

- c] The power point outlet may 15A/ 5A or 16A/ 6A six pin socket outlet, where so specified in the tender documents.

##### 1.3 Twin control light points wiring

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- a] A light point controlled by two numbers of two way switches shall be measured as two points from the fitting to the switches on either side.
- b] No recovery shall be made for non-provision of more than one ceiling rose or connector in such cases.

#### 1.4 Multiple controlled call bell points wiring

- a] In the case of call bell points with a single call bell outlet, controlled from one more than one place, the points shall be measured in part i.e.(a) from one call bell outlet to one of the nearest ceiling rose meant for connection to bell push, treated as one point and classified from that ceiling rose to the next one and so on , shall be treated as separately point(s).
- b] No recovery shall be made for non- provision of more than one ceiling rose or connector for connection to call bell in such cases.

## 2. **CIRCUIT AND SUBMAIN WIRING**

### 2.1 Circuit Wiring

Circuit wiring shall mean the wiring from the distribution board upto the tapping point for the nearest first point of that distribution circuit, viz. upto the nearest first switch box.

### 2.2 Submain wiring

Submain wiring shall mean the wiring from one main / distribution switchboard to another.

### 2.3 Measurement of circuit and submain wiring

- a] circuit and submain wiring shall be measured on linear basis along the run of the wiring. The measurement shall include all lengths from end conduit as the case may, exclusive on interconnections inside the switch board etc. The increase on account of diversion or slackness shall not be included in the measurement.
- b] The length of circuit wiring with two wires shall be measured from the distribution board to the first nearest switch box in the circuit irrespective of whether the neutral conductor is taken to switchbox or not.
- c] When circuit wires and wires of point wiring are run in same conduit/ circuit wiring shall be measured on linear basis depending on the actual number and sizes of wires run in the existing conduit.
- d] Protective (loop earthing) conductors which are run along the circuit wiring and the submain wiring shall be measured on linear basis and paid for separately.

## 3. **SYSTEM OF DISTRIBUTION AND WIRING**

### 3.1 Distribution

- a] Main distribution board shall be controlled by a circuit breaker or linked switch with fuse. Each outgoing circuit shall be controlled by a switch with fuse, circuit breaker or only a fuse on the phase or live conductor.
- b] The branch distribution board shall be controlled by a linked switch fuse or circuit breaker. Each outgoing circuit shall be provided with a fuse or miniature circuit breaker (MCB) of specified rating on the phase or live conductor.

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- c] Triple pole distribution boards shall not be used for final circuit distribution, unless specific approval of the Engineer-in-charge is obtained. In such special cases, the triple pole distribution boards shall be of HRC fuse type or MCB type only.
- d] The loads of the circuits shall be divided, as far as possible , evenly between the number of ways of the distribution boards, leaving at least one spare circuit for future extension.
- e] 'Power' wiring shall be kept separate and distinct from 'Lighting' wiring, from the level of circuits i.e. beyond the branch distribution boards.

### 3.2 Wiring system

- a] Unless and otherwise specified in the tender documents, wiring shall be done only by the "Looping system". Phase or live conductors shall be looped at the switch boxes and neutral conductors at the point outlets.
- b] Lights, fans and call bells shall be wired in the 'lighting' circuits. 15A/ 16A socket outlets and other power outlets shall be wired in the 'Power' circuits. 5A/ 6A socket outlets shall be wired in the 'lighting' circuits in non residential buildings and in the 'power' circuit in residential buildings.

### 3.3 Passing through walls or floors

- a] Where a wall pipe passes outside a building so as to be exposed to weather, the outer end shall be mounted and turned downwards and properly bused on the open end.

### 3.4 Joints in wiring

- a] There shall be no joints in the through-runs of cables. If the length of final circuit or sub-main is more than the length of a standard coil, thus necessitating a through joint, such joints shall be made by means of approved mechanical connectors in suitable junction boxes.
- b] Termination of multi-stranded conductors shall be done using suitable crimping type thimbles.

## 4. **RATING OF OUTLETS (TO BE ADOPTED FOR DESIGN)**

- a] Ceiling fans shall be rated at 60 W. Exhaust fan, fluorescent tubes, compact fluorescent tubes, HPMV lamps, HPSV lamps etc. shall be rated according to their capacity. Control gear losses shall be also considered as applicable.
- b] 5A / 6A and 15A / 16A socket outlet points shall be related at 100W and 1000W respectively, unless the actual values of loads are specified.

## 5. **CAPACITY OF CIRCUITS :**

- a] "Lighting" circuit shall not have more than a total of 10 points of light, fan and socket outlets, or a total connected load of 800W, whichever is less.
- b] "Power" circuit shall be designed with only one outlet per circuit in nonresidential buildings. The circuit shall be designed based on the load. Where not specified, the load shall be taken as 1 KW per outlet.
- c] "Power" circuit in residential buildings shall be designed for not more than two outlets (15A/ 16A and / or 5A/ 6A) per circuit. The ratings for load calculation purposed shall however be taken as per the type of outlets.

- d] Load more than 1 KW shall be controlled by an isolator or miniature circuit breaker.

## **6. WIRING ACCESSORIES**

### 6.1 Control switches for points

- a] All the Switches, Sockets, TV socket and Computer Socket shall be modular type.
- b] Power (15A/ 16A) outlets shall be controlled by single pole modular type switches or by MCB's, where specified. Only MCB's shall be used for controlling industrial type socket outlets, and power outlets above 1 KW.

### 6.2 Socket outlets

- a] Socket outlets shall be of the same type, namely modular type, as their control switches. These shall be rated either for 5A/ 6A, or 15A/16A. Combined 5A/ 15A, or 6A/ 16A six pin socket outlet may be provided in 'power circuits only where specified.
- b] Outlet boxes for socket outlets (both 15A/ 16A and 5A/ 6A) points in residential buildings.

## **7. FITTINGS**

### 7.1 Indoor type fittings

- a] Fittings using discharge lamps shall be complete with power factor correction capacitors, either integrally or externally. An earth terminal with suitable marking shall be provided for each fitting for discharge lamps.
- b] Fittings shall be installed such that the lamp is at a height of 2.5m above floor level, unless otherwise directed by the Engineer-in-charge.

### 7.2 Bulk head fittings

Bulk head fittings shall be of cast iron / cast aluminium body, suitably painted white inside and gray outside, complete with heat resistant glass cover, gasket, BC lamp holder for 100W incandescent lamp.

## **8. MCB TYPE DISTRIBUTION BOARD (MCBDB)**

- a] MCBDB's may be of single phase, 3 phase (horizontal type) suitable for feeding single phase loads, or 3 phase (vertical type) suitable for feeding single phase as well as 3 phase loads, as specified. These shall be complete with accessories, but without MCB's which shall be specified as a separate item in the tender documents.
- b] The current ratings and the number of ways shall be as specified. Blanking plates shall be provided to close unused ways. These shall be indicated as separate item in the Schedule of work.

## **9. PRE-WIRED MCB DISTRIBUTION BOARDS**

- a] The board shall also be provided with a loose wire box as a compartment for the complete width and , depth of the board, and of minimum height of 125mm in case of TPN DB's, and 100mm in case of SPN DB's.

- b) The board shall be provided with a hinged cover of 1.6mm thick sheet steel in the front. Only the knobs of the MCB's shall protrude out of the front covers through openings neatly machine made for the purpose.
- c) The board shall be complete with the following accessories:-
  - i) 200 A copper busbar (s).
  - ii) Neutral link.
  - iii) Common earth bar.
  - iv) DIN bar for mounting MCB's.
  - v) Elemex type terminal connectors suitable for incoming and outgoing cables.
  - vi) A set of indication lamps with HRC cartridge fuses for each phase of the incoming supply.
  - vii) Earthing stud.(s)

Note:- MCB's and blanking plates shall be specified as separate items, as required.

## **10. SWITCH BOARD LOCATIONS**

### 10.1 Cubicle type switchboards

Cubicle type switchboards shall be conform to section 4 of "General Specifications for Electrical Works (Part - IV - Substation), 1982".

## **11. SWITCH BOARD INSTALLATION**

- a) Unless and otherwise specified in the tender documents, a switchboard shall not be installed so that its bottom is within 1.25 m above the floor.
- b) There shall be a clear distance of 1 m in front of the switch boards. The space behind the switchboards shall be either less than 20 cm or more than 75 cm. If there are any attachments or bare connections at the back of the switch board. Rule 51 (c) of the Indian Electricity Rules shall apply.
- c) Where it is required to terminate a number of conduits on a board. it may be convenient to provide a suitable MS adopter box for the purpose. Such boxes shall be provided with the prior approval of the Engineer-in-charge and this will be paid for separately.
- d) No apparatus shall project beyond any edge of the panel. No fuse body shall be mounted within 2.5cm of any edge of the panel.
- e) Busbars and interconnecting strips in fabricated boards shall be PVC tapped or sleeved in Red, Yellow and Blue for phases, and Black for neutral. The interconnecting cables shall also follow this colour coding.

## **12. ATTACHMENT OF FITTINGS AND ACCESSORIES**

### 12.1 Conduit wiring system

- a) All accessories like switches, socket outlets, call bell pushes and regulators shall be fixed in flush pattern inside the switch/ regulator boxes.
- b) Aluminum alloy or cadmium plated iron screws shall be used to fix the accessories to their bases.
- c) The switch box/ regulator box shall normally be mounted with their bottom 1.25cm from floor level, unless otherwise directed by the Engineer-in-charge.

## **13. FIXING TO WALLS AND CEILING**

- a] Wooden plugs for ordinary walls or ceiling shall not be used in view of the ban on use of timber in Govt. works. However, where so specified, these shall be of well seasoned teak or other approved hard wood not less than 5 cm long by 2.5cm square on the inner end, and 2cm square on the outer end. They shall be cemented into walls within 6.5mm of the surface, the remainder being finished according to the nature of the surface with plaster or lime punning.
- b] PVC sleeves/ dash fasteners should normally be used for fixing to walls or ceiling.

### **M.S. CONDUIT WIRING SYSTEM**

#### **APPLICATION**

- a] Recessed conduit is suitable generally for all applications. Surface conduit work may be adopted in places like wiring above false ceiling / below false flooring, and at locations where recessed work may not be possible to be done. The type of work, viz. surface or recessed, shall be as specified in the respective works.
- b] Flexible conduits may only be permitted for interconnections between switchgear, DB's and conduit terminations in wall.

#### **MATERIALS**

##### **Conduits**

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- a] All rigid conduit pipes shall be of MS and ISI marked. The wall thickness shall not be less than 1.6mm (16 SWG) for conduits up-to 32mm dia. and not less than 2mm (14 SWG ) for conduits above 32mm dia.
- b] No MS conduit less than 20mm in diameter shall be used.

##### **Conduit accessories**

- a] All conduit accessories shall be of solid type.
- b] Saddles for surface conduit work on wall shall not be less than 0.55mm (24 gauge) for conduits upto 25mm dia. and not less than 0.9mm (20 gauge) for larger diameter. The corresponding widths shall be 19mm & 25mm.

##### **Outlets**

- a] The switch box or regulator box shall be made of metal on all sides, except on the front. In the case of cast boxes, the wall thickness shall be at least 3mm and in case of welded mild steel sheet boxes, the wall thickness shall not be less than 1.2mm (18 gauge) for boxes upto a size of 20cm x 30cm, and above this size 1.6mm (16 gauge) thick MS boxes shall be used. The metallic boxes shall be duly painted with anticorrosive paint before erection as per chapter 10 of these specifications.
- b] Outlet boxes shall be of one of the size, covered in the Schedule of Rates (Elect.), Part I-Internal.
- c] Where a large number of control switches and/ or fan regulators are required to be installed at one place, these shall be installed in more than one outlet box adjacent to each other for ease of maintenance.

- d] An earth terminal with stud and 2 metal washers shall be provided in each MS box for termination of protective conductors and for connection to socket outlet/ metallic body of fan regulator etc.
- e] Clear depth of the box shall not be less than 50mm, and this shall be increased suitably to accordance mounting of fan regulators in flush pattern.

### **INSTALLATION**

#### **Common aspects for recessed and surface conduit works.**

##### **a] Bends in conduit**

- i) All necessary bends in the system, including diversion, shall be done either by neatly bending the pipes without cracking with a bending radius, or alternatively, by inserting suitable solid type normal bends or similar fittings, whichever is most suitable.
- ii) No length of conduit shall have more than the equivalent of four quarter bends from outlet to outlet.

#### **Additional requirements for surface conduit work.**

##### **a] Fixing conduit on surface**

Conduit pipes shall be fixed by saddles, secured to suitable approved plugs with screws in an approved manner at an interval of not more than one metre, but on either side of the couplers or bends or similar fittings, saddles shall be fixed at a distance of 30 cm from the centre of such fittings.

##### **b] Fixing outlet boxes**

Only a portion of the switch box shall be sunk in the wall, the other portion being projected out for suitable entry of conduit pipes into the box.

#### **Additional requirements for recessed conduit work**

##### **a] Fixing conduits in chase**

- i) The conduit pipe shall be fixed by means of J-hooks, or by means of saddles, not more than 60 cm apart, or by any other approved means of fixing.
- ii) All joints of conduit pipes shall be treated with some approved preservative compound to secure protection against rust.

##### **b] Fixing conduits in RCC work**

The conduit pipes shall be laid in position and fixed to the steel reinforcement bars by steel binding wires before the concreting is done. The conduit pipes shall be fixed firmly to the steel reinforcement bars to avoid their dislocation during pouring of cement concrete and subsequent tamping of the same.

- ii) Fixing of standard bends or elbows shall be avoided as far as practicable, and all curves shall be maintained by bending the conduit pipe itself with a long radius which will permit easy drawing in of conductors.



c] **Fixing inspection boxes**

1. Suitable inspection boxes to the minimum requirement shall be provided to permit inspection, and to facilitate replacement of wires, if necessary.
2. These shall be mounted flush with the wall or ceiling concrete. Minimum 65mm depth junction boxes shall be used on roof slabs and the depth of the boxes in other places shall be as per IS: 2667 - 1977.

d] **Fixing switch boxes and accessories**

Switch boxes shall be mounted flush with the wall. All outlets such as switches, socket outlets etc. shall be flush mounting type, unless otherwise specified in the Additional Specifications.

e] **Fish wire**

- i) To facilitate subsequent drawing of wires in the conduit, GI fish wire of 1.6mm / 1.2mm ( 16/ 18 SWG ) shall be provided along with the laying of the recessed conduit.
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## **MEDIUM VOLTAGE DISTRIBUTION BOARDS FOR POWER AND LIGHTING DISTRIBUTION**

### **General**

Distribution board shall be suitable for 415 Volt, 3 phase AC supply or 230 volt single phase AC supply as required. Distribution boards shall generally conform to IS 2675 or BS 214. However, the specifications hereinafter described shall take precedence over the above wherever this specification call for a higher standard or material or workmanship.

### **Type and construction**

Distribution boards shall be of totally enclosed dead front safety type. The enclosure be made of best quality sheet steel of not less than 14 gauge. The sheet steel shall be treated with a rigorous rust inhibited process before fabrication. The distribution boards shall comprise of MCB isolator or moulded case circuit breaker as incoming and required number of miniature circuit breaker as outgoings. The main and outgoings shall have rating as specified on the drawings and schedule.

### **Busbar**

Suitable bus bars made of high conductivity copper strips and mounted on non-hygroscopic insulating supports shall be provided.

### **Circuit Breaker**

Moulded case circuit breaker and miniature circuit breakers shall be of approved design and make. Circuit breakers shall be equipped with individually insulated, traced and protected connectors. The front face of all the breakers shall be flush with each other. Each breaker shall be provided with card holder and neatly printed card identifying the circuit. The position of handle of the breaker shall clearly indicate the condition of breakers such as "**ON/OFF/TRIPPED**".

### **Safety & Interlocks**

All the live parts shall be shrouded such that accident contacts with live parts are totally avoided. Distribution board shall be provided with a front hinged door. Distribution board shall be provided with a front hinged door. Distribution board interior assembly shall be dead front with the front cover removed. Main lugs shall be shrouded on five sides. Suitable insulating barrier made of arc resistant material shall be provided for phase separation. Ends of the bus structures shall also be shrouded.

### **Cabinet Design**

The distribution board cabinet shall be totally enclosed type with dust and vermin proof construction. The cabinet shall be stove enamelled to grey shade finish. The interior surface shall be finished to an off-white shade. The interior components shall be mounted on a separate sheet steel which is mounted and locked on to the studs provided inside the cabinet. Over this, a cover made of hylam sheet or stove enamelled sheet steel shall be provided with slots for operating handles of breakers. The cabinet shall be provided with a front door having a spring latch and vault lock. Cabinets shall have detachable gland plates at both top and bottom.

### **Terminals**

Distribution boards shall be provided with a terminal block of adequate size to receive mains and outgoings circuits. The location of the terminal block shall be so located that crowding of wires in the proximity of live parts is avoided. A neutral link having rating equal to that of phase bus shall be provided.

**Directory**

Distribution boards shall be provided with a directory indicating the area or loads served by each circuit breaker, the rating of breakers, size of conductors etc. The directory shall be mounted in metal holder with a clear plastic sheet on inside surface of the front door.

**Installation**

Distribution boards shall be surface mounted or recessed mounted as required by the Architects and at the locations shown on the drawings. The boards shall be fixed with suitable angle iron clamps and bolts. All the cables / conduits shall be properly terminated using glands / grips / check nuts etc. Wiring shall be terminated properly using crimping lugs / sockets and PVC identification ferrules. No bare conductor shall be allowed inside the boards. Distribution boards shall be bonded to the earth at least at two points using brass bolts and lugs. Suitable name plate, danger plate, indicating the voltage shall be fixed to the front cover.

**Testing**

Distribution board shall be tested at factory as per IS 2675 or BS 214. The tests shall include insulation test, high voltage test etc.

Distribution boards shall be tested for insulation resistance after the erection.

**CUBICLE TYPE BOARDS**

Cubicle type switch board shall be fabricated out of sheet steel not less than 2.0 mm thick. Wherever necessary, such sheet steel members shall be stiffened by angle iron frame work. General construction shall employ the principle of compartmentalisation and segregation for each circuit. Unless otherwise approved, incomer and bus section panels or sections shall be separate and independent and shall not be mixed with sections required for feeders. Each section of the rear accessible type board shall have hinged access doors at the rear. Overall height of the board shall not exceed 2.0 meters. Operating levers, handle etc, of highest unit shall not be at a height more than 1.7 m. Multi-tier mounting of feeders is permissible. The general arrangement for multi-tier construction shall be such that the horizontal tiers formed present a pleasing and aesthetic look. The general arrangement shall be got approved before fabrication. Cable entries for various feeders shall be either from the rear or from the front through cable alleys located in between two circuit sections. All cable entries shall be through gland plates. There shall be separate gland start plate for each cable entry so that there will not be dislocation of already wired circuit when new feeders are added. Cable entry plates shall therefore be sectionalised. The construction shall include necessary cable supports for clamping the cable in the cable alloy or rear cable chamber.

**SWITCH BOARD INSTALLATION**

- a] Switchboard shall not be installed so that its bottom is within 1.25 m above the floor.
- b] There shall be a clear distance of 1 m in front of the switch boards. The space behind the switchboards shall be either less than 20 cm or more than 75 cm. If there are any attachments or bare connections at the back of the switchboard. Rule 51 (c) of the Indian Electricity Rules shall apply.
- c] Where it is required to terminate a number of conduits on a board. it may be convenient to provide a suitable MS adopter box for the purpose. Such boxes shall be provided with the prior approval of the Engineer-in-charge and this will be paid for separately.
- d] No apparatus shall project beyond any edge of the panel. No fuse body shall be mounted within 2.5cm of any edge of the panel.

- e] Busbars and interconnecting strips in fabricated boards shall be PVC tapped or sleeved in Red, Yellow and Blue for phases, and Black for neutral. The interconnecting cables shall also follow this color coding.

### **TESTING OF INSTALLATION**

#### **GENERAL**

##### **Tests**

On completion of installation, the following tests shall be carried out:-

- a] Insulation resistance test.
- b] Polarity test of switch.

##### **Witnessing of Tests**

Testing shall be carried out for the completed installations, in presence of and to the satisfaction of the Engineer-in-Charge by the contractor. All test result shall be recorded and submitted to the Department.

#### **INSULATION RESISTANCE**

The insulation resistance in mega ohms measured as above shall not be less than 12.5 mega ohms for the wiring PVC insulated cables, subject to a minimum of 1 mega ohm.

A preliminary and similar test may be made before the lamps etc. are installed, and in this event the insulation resistance to earth should not be less than 25 mega ohms for the wiring with PVC insulated cables, subject to a minimum of 2 mega ohms.

The term "outlet" includes every point along with every switch, except that a switch combined with a socket outlet, appliance or lighting fitting is regarded as one outlet.

#### **POLARITY TEST OF SWITCH**

The installation shall be connected to the supply for testing. The terminals of all switches shall be tested by a test lamp, one lead of which is connected to the earth. Glowing of test lamp to its full brilliance, when the switch is in "on" position irrespective of appliance in position or not, shall indicate that the switch is connected to the right polarity.

**DRAWINGS**