

PART -B

MAJOR COMPONENT - ELECTRICAL

**SPECIAL CONDITIONS,
PARTICULAR SPECIFICATIONS,
LIST OF PREFERRED MAKES**

SPECIAL CONDITIONS

Name of Work: Replacement of 4 Nos 13 Passenger Lifts at GPOA, Kendriya Bhavan, Kakkanad, Kochi, Kerala.

Internal Electrical Installations

1 GENERAL

1.1 The work shall be generally carried out in accordance with tender/bid specifications and the following specifications / rules with up to date amendments.

- a) CPWD General Specifications for Electrical work Part I Internal - 2023, as amended up to date
- b) CPWD General Specifications for Electrical work Part II External-2023, as amended up to date
- c) CPWD General Specifications Part-III Lift & Escalators - 2003, as amended up to date
- d) Commercial and Additional conditions for this work.
- e) The Indian Electricity Act, 2003, as amended up to date.
- f) CEA (Measures relating to Safety and Electric Supply) Regulations, 2023, as amended up to date.

2 Defect liability period

2.1 The contractor has to carry out maintenance as per CPWD General Specifications / manufacturer's standards for a period of 12 months or as decided by the Engineer -in - Charge from the date of handing over. Nothing extra shall be paid on this account.

2.2 In case of Specialized E&M works if Engineer-in-charge desires, the tenderer should submit the following documents from OEM for that particular minor component

- a) Authorization certificate.
- b) The OEM is unconditionally support the lowest tenderer technically throughout the execution of contract as well as for Maintenance/Comprehensive Maintenance Contract for the useful life of the system, and
- c) OEM shall provide all the spares required for healthy functioning of the equipment for at least seven years from the date of supply of equipment.

- 2.3 In case the same item appears more than once in the schedule of work under the same sub head or among the different subhead of works, the lowest rate quoted for that item elsewhere shall be considered for other items also during evaluation of tender.

3 COMPLETENESS OF TENDER

All sundry equipment, fittings, unit assemblies, accessories, hardware items, foundation bolts, termination lugs for electrical connections, and all other items which are useful and necessary for efficient assembly and installation of equipment and components of the work shall be deemed to have been included in the tender irrespective of the fact whether such items are specifically mentioned in the tender documents or not.

4 CARE OF THE BUILDING:

Care shall be taken by the contractor while handling and installing the various equipment's and components of the work to avoid damage to the building. He shall be responsible for repairing all damages and restoring the same to their original finish at his cost. He shall also remove at his cost all unwanted and waste materials arising out of the installation from the site of work.

5 COMPLETION PERIOD

The completion period indicated in the tender documents is for the entire work of planning, designing, approval of drawings etc., arrangement of materials & equipment's, delivery at site including transportation, installation, testing, commissioning and handing over of the entire system to the satisfaction of the Engineer-in-charge.

6 GUARANTEE

- 6.1 All equipment's shall be guaranteed for a period of 12 months (except LED fittings which shall be guaranteed for minimum 5 years from the date of taking over the installation by the department, against unsatisfactory performance and/or break down due to defective design, workmanship or material. The equipment's or components, or any part thereof, so found defective during guarantee period shall be repaired or replaced free of cost, to the satisfaction of the Engineer-in Charge. In case it is felt by the department that undue delay is being caused by the contractor in doing this, the same will be got done by the department at the risk and cost of the contractor. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.
- 6.2 The tender shall guarantee among other things, the following:
- a. Quality, strength and performance of the materials used as per manufacturers standards.
 - b. Safe mechanical and electrical stress on all parts under all specified conditions of Operation. Satisfactory operation during the maintenance period.

7 DRAWINGS FOR APPROVAL AFTER AWARD OF THE WORK

The contractor shall prepare & submit three sets of following drawings and get them approved from the Engineer-in-Charge before start of the work. These drawing shall be submitted to division office within 15 days after award of work. The approval drawings, however, does not absolve the contractor not to supply the equipment/materials as per agreement, if there is any contradiction between the approved drawings and agreement.

- a. General arrangement drawings of the Electrical panel boards / equipment.
- b. Drawing of electrical installations etc.
- c. Lay out drawings of the equipment to be installed including control cables and cable trays.
- d. Any other drawings relevant to the work.

8 BEFORE COMMENCEMENT OF INSTALLATION

The contractor shall also furnish 3 copies of detailed installation, operation and maintenance manuals of manufacturers for all items of equipment together with all relevant data sheet, spare parts catalogues, repairs, assembly and adjustment procedure etc., in triplicate.

9 Drawings / Documents to be furnished on completion of installation

Three sets of the following drawings/ documents (hard copies) shall be submitted by the contractor while handing over the installation to the Department. The drawing shall be developed on AutoCAD showing all electrical points with layout and a CD containing the drawings shall also be submitted.

- 9.1 Equipment layout drawing(s) giving complete details of the entire equipment.
- 9.2 Cable laying plan with route and sizes of cables
- 9.3 Manufacturer's technical catalogues of all equipment and accessories.
- 9.4 Drawing of electrical installations etc.
- 9.5 Operation and maintenance manual of all major equipment, detailing all adjustments, operation and maintenance procedure.
- 9.6 Schematic diagram of the entire equipment installations.

10 EXTENT OF WORK

- 10.1 The work shall comprise of entire labour including supervision, all materials necessary to make a complete installation, tests and adjustments and commissioning, as may be required by the department. The term complete installation shall not only mean major items of the plant and equipment's covered by specifications but all incidental sundry components necessary for complete execution and satisfactory performance of installation

with all layout charts whether or not been mentioned in details in the tender document in connection with this contract as this is a turnkey job.

- 10.2 The cables and all other items shall be brought to site only after taking correct measurements as per actual requirement of work. Excess quantities shall not be accepted and paid. i.e., Quantity of item brought to site and used in work as per actual requirement shall only be measured and paid irrespective of quantities of BOQ / work schedule. The item brought at site and paid, if not used in the project have to be taken back by the contractor and deductions in the payment shall be adjusted in subsequent bills. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.
- 10.3 In addition to supply, installation, testing and commissioning, of all E&M equipment, following works shall be deemed to be included within the scope of work to be executed by the tenderer.
- a) Minor building works necessary for installation of equipment's, foundation, making of opening in walls or in floors and restoring them to their original condition finish and necessary grouting etc. as required.
 - b) All necessary supports may be arranged.
 - c) Testing of PTs/CTs for metering & protection purpose & relay calibration & setting.
 - d) Getting inspection done & obtaining approval from Central Electrical Authority and local fire authority for energizing the installation. However, necessary fees for inspection shall be borne by the Department.

11. INSPECTION AND TESTING

- 11.1 Copies of all documents of routine and type test certificates of the equipment, carried out at the Manufacture's premises shall be furnished to the Engineer-in-charge. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.
- 11.2 After completion of the work in all respects the contractor shall offer the installation for testing and operation. The contractor should submit all the related documents of completed ELV / E&M equipment to the department for further handing over to client department.

12. COMPLIANCE WITH REGULATIONS AND INDIAN STANDARDS

- 12.1 All works shall be carried out in accordance with relevant regulation, both statutory and those specified by the Indian Standards related to the works covered by this specification.

In particular, the equipment and installation will comply with the following:

- i) Factories Act.

- ii) CEA (Measures relating to Safety and Electric Supply) Regulations, 2023.
- iii) B.I.S. & other standards as applicable.
- iv) Workmen's compensation Act
- v) Statutory norms prescribed by local bodies like CEA, Power Supply Co., Fire authorities, etc.
- vi) NBC 2016

12.2 Nothing in this specification shall be construed to relieve the successful tenderer of his responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with currently applicable statutory regulations and safety codes.

13. INDEMNITY:

The successful tenderer shall at all times indemnify the department. Consequent on this works contract, the successful tenderer shall be liable, in accordance with the Indian Law and Regulations for any accident occurring due to any cause and the contractor shall be responsible for any accident or damage incurred or claims arising there during the period of erection, construction and putting into operation the equipment's and ancillary equipment under the supervision of the successful tenderer to the extent the latter is responsible. The successful tenderer shall also provide all insurance including third party insurance as may be necessary to cover the risk. No extra payment would be made to the successful tenderer on account of the above.

14. ERECTION TOOLS:

No tools and tackles either for unloading or for shifting the equipment's for erection purposes would be made available by the department. The successful tenderer shall make his own arrangement for all these facilities.

15. COOPERATION WITH OTHER AGENCIES:

The successful tenderer shall co-ordinate with other contractors and agencies engaged in the construction of buildings, if any, and exchange freely all technical information so as to make the execution of this work/contract smooth. No remuneration should be claimed from the department for such technical cooperation. If any unreasonable hindrance is caused to other agencies and any completed portion of the work has to be dismantled and re-done for want of cooperation and coordination by the tenderer during the course of work, such expenditure incurred will be recovered from the successful tenderer if the restoration work to the original condition or specification of the dismantled portion of the work was not undertaken by the tenderer himself.

The work will be carried out with least disturbance during shifting & shut down taken in consultation with the client department.

16. VERIFICATION OF CORRECTNESS OF EQUIPMENT AT DESTINATION:

The contractor shall have to produce all the relevant records to certify that the genuine equipment's from the manufacturers has been supplied and erected to the satisfaction of the Engineer-in-charge.

17. MAINTENANCE:

Sufficient trained and experienced staff shall be made available to meet any exigency of work during the guarantee period of one year from the handing over of the installation.

The maintenance, routine as well as preventive, for one year from the date of taking over the installation as per manufacturer's recommendation.

18. Approval of drawings, makes and models of equipment/materials for all E&M components :

18.1 The agency shall submit drawings and details such as makes and models of the equipment's/materials offered by him along with specifications for all E&M components to the Engineer-in-charge of the work, before ordering the equipment/materials for approval of the department.

18.2 The Engineer-in-charge shall scrutinize the proposal and approve the makes and models which are acceptable as per the schedule, specifications, conditions of the agreement and inform the agency for procurement.

18.3 After approval of the equipment/materials by the department the agency shall procure the equipment/materials from the OEM/authorized distributor/dealer as the case may be.

19. Adequate care that only tested and genuine materials of proper quality are used in work shall be ensured by firm. The firm shall also ensure that:

- i. Material will be ordered & delivered at site only with the prior approval of the department to ensure timely delivery.
- ii. As and when the order is placed for the fittings/ fixtures, cables, switchgears, poles, other main items etc, its copy shall be endorsed to the Engineer-in-charge of work.
- iii. The contractor will submit makes & brands of electrical fittings wires & cables, conduits and poles , outdoor fittings etc. of preferred make list as per tender documents for approval of Engineer-In-Charge, whose decision will be final in the matter.
- iv. The firm will be required to procure material directly from the manufacturer/

authorized dealers to ensure genuineness & quality and as per the approved makes only. Proof in this regard shall be submitted by the contractor if required by the department.

- v. Inspection at factory or at go down, as required, shall be arranged by the firm for a mutually agreed date.
- vi. Delivery of material shall be taken up only with the consent of department, after clearance of the material.
- vii. Department shall reserve the right to waive off inspection in lieu of suitable test certificate, at its discretion.
- viii. All the materials to be supplied by the contractor shall be procured & brought to site as per requirement at site of work in consultation with department so that these materials are not damaged & their manufacturer's warrantee.

20. Safety Codes & Statutory Regulations:

Nothing in this specification shall be construed to relieve the successful tenderer of his responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with currently applicable statutory regulations and safety codes.

Successful tenderer shall arrange for compliance with statutory provisions of safety regulations and departmental requirements of safety codes in respect of labour employed on the work by the tenderer. Failure to provide such safety requirement would make the tenderer liable for penalty of Rs.1000/- for each default. In addition, the department will be at liberty to make arrangement for the safety requirements at the cost of tenderer and recover the cost thereof from him.

PARTICULAR SPECIFICATIONS AND SPECIAL CONDITIONS FOR E&M WORKS

1. GENERAL

1. The tenderer should in his own interest visit the sites and familiarize himself with the site conditions before tendering.
2. No T&P shall be issued by the department and nothing extra shall be paid on account of this.
3. Care shall be taken, while handling / installing / maintaining the equipment/ carrying out the work, to avoid damage to the building/ premises. The Contractor shall arrange to repair all damages to the building caused by him so as to bring to the original condition. He shall also arrange to remove all unwanted waste materials from site, arising out of his work.
4. The Contractor shall carry out the work in such a manner so as not to interfere or affect or disturb other works being executed by other agencies if any. No claim in the matter shall be entertained.

2. RATES TAXES AND DUTIES:

1. The work shall be treated as on works contract basis and the rates tendered shall be for complete items of works inclusive of all taxes (including works contract tax), duties, and levies etc. and all charges for items contingent to the work, such as packing, forwarding, insurance, freight and delivery, installation, testing, commissioning etc at site i/c temporary constructional storage, risk, overhead charges, general liabilities/ obligations etc.
2. Being an indivisible works contract, sales tax, octroi, excise duty etc. are not payable separately.
3. GST for the work shall be included within the quoted rates for the various items.
4. All statutory deductions like GST, Building and other construction workers welfare cess etc at applicable rates will be made from the Contractors bill.

3. COMPLIANCE WITH REGULATIONS

The work shall comply in all respects with this specification and:

- a. The Building Regulations applying to the project including requirements of the National Building Code 2016.

- b. Wiring rules and regulations including requirements of Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations 2023, National Electrical Code of India 2023, the local electricity supply authority and electrical inspectorate.
- c. Any other regulations that apply directly or indirectly to such installations in the location. Where conflict arise between this specification and any of the applicable acts, codes or standards the highest standard of materials and workmanship shall prevail.
- d. If the contractor proposes to supply finished goods procured directly or indirectly from vendors, from the countries sharing land border with India, such vendor will be required to be registered with the competent authority under Government of India. Such procurement shall be accepted only on furnishing the details of such registration.
- e. For materials to be used in work for which Government of India has notified minimum percentage of local content under, Public Procurement (Preference to Make in India) Order 2017 (Amended up to date), it shall be mandatory to supply materials meeting such stipulation.
- f. **Prior to commencement of work, all applicable statutory clearances required for taking up the work shall be obtained by the contractor. This shall include NOC from Kerala Fire and Rescue Services, Consent to Establish (CTE) NOC from Kerala Pollution Control Board, Initial scheme approval from Central Electricity Authority/Kerala Electrical Inspectorate etc.**
- g. **After completion of the work, the completed installation shall be offered for inspection to inspectors of the relevant statutory authorities. This shall include NOC from Kerala Fire and Rescue Services, Consent to Operate (CTO) NOC from Kerala Pollution Control Board, Energization approval from Kerala Electrical Inspectorate/ Central Electricity Authority etc. The contractor shall prepare and submit necessary drawings, test certificates, other documents etc. for submission to these bodies. It shall be the responsibility of the contractor to liaison with/ coordinate with such inspecting authorities for obtaining the approval for the installation. The rectifications required by such statutory authorities shall be carried out by the contractor. Nothing extra shall be payable to the Contractor on this account. The installation shall be commissioned only after obtaining all applicable statutory clearances.**
- h. It shall be the responsibility of the contractor to liaison with/ coordinate with the electricity supplier for availing power supply and energizing the installation.

- i. Statutory fees if any for obtaining statutory clearances/ availing power supply shall be paid by the contractor and the same shall be reimbursed on production of evidentiary proof to the department.
- j. Prior to commencement of work, all applicable statutory clearances required for taking up the work shall be obtained by the contractor.

4. **TERMS OF PAYMENT**

4.1 Payment will be made against completion of specific stages of work. The percentage of contract rates payable against various stages of work is given below.

(a) For IEI :

S.N.	Stage of Work	Payment terms in %
1	Supplying and laying/fixing of conduit, switch boxes, DBs etc.	40%
2	On completion of wiring	50%
3	Supply of fans & fittings	75%
4	Installation of equipment, earthing etc	85%
5	Testing & commissioning	95%
6	Handing Over	100%

(b) For other works

S.N	Item of work	On initial inspection of materials and delivery at site in good condition on pro-rata basis	On completion of pro-rata installation	On completion of testing and commissioning	After obtaining statutory clearances, trial run, training and handing over
1	LIFTS	70	15	10	5

4.2 No claim for payment shall accrue to the contractor for incomplete stages.

4.3 The department may at its discretion, allow part payments on written request from the contractor, on account of compelling reasons to be brought on record. In such event, the part rates assessed by the engineer-in-charge will be final and binding.

5. ADDITIONAL CONDITIONS AND TECHNICAL SPECIFICATIONS

- 1 The work shall be generally carried out in accordance with tender specifications and the following specifications/ rules amended upto date:
 - (i) Additional conditions and technical specifications for this work.
 - (ii) Drawings for this work.
 - (iii) CPWD General Specifications for Electrical Works -Part-I Internal 2023 and Part-II External 2023.
 - (iv) CPWD General Specifications Part-III Lifts & Escalators - 2003
 - (v) National Electrical Code of India 2023.
 - (vi) National Building Code 2016.
 - (vii) Relevant IS Codes.
 - (viii) IEC/ ASHRAE/ SMACNA/ ITU/ TIA/ AVIXA standards.
2. The contractor shall, on demand by the engineer-in-charge, furnish proof to the satisfaction of the engineer-in-charge regarding purchase of materials and equipment from the manufacturer/ manufacturer's authorized outlets.
3. Materials to be used in work are to be ISI marked where available. Prior approval of the engineer-in-charge shall be taken for all the materials required to be used on works. Non-standard quality materials will not be accepted. The engineer-in-charge reserves the right to instruct the contractor to remove any material which, in his opinion, is not acceptable and the same shall be removed from the site of work by the contractor at his cost.
4. All materials used in work shall be supplied with manufacturers test certificates. Samples will be drawn from the supplied materials as per acceptance criterion specified in relevant codes and the same will be got tested through approved third party testing laboratories. The contractor shall make all necessary arrangements and bear all costs towards testing of samples including preparation of samples, packaging, sealing, transportation, loading, unloading, etc. No additional payment will be admissible towards this.
5. Materials shall be brought to site only after taking correct measurements as per actual requirement of work. Excess quantity will not be accepted or paid. Only quantity of materials brought to site and used in work as per actual requirement shall be measured and paid irrespective of quantity mentioned in BOQ/ work schedule. The items brought to site and paid, if not used in the project have to be taken back by the contractor and

deductions in the payment shall be made in subsequent bills. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.

6. The materials of construction used for various items of work shall be suitable for the environment and intended use of the component. Following general guidelines shall be followed.
 - (a) Equipment & wiring enclosures, raceways etc used indoor shall be with epoxy powder coated/ hot dipped galvanized finish.
 - (b) Support structures, fasteners, raceways etc used outdoor shall be of hot dipped galvanized steel or stainless steel.
 - (c) Paint finish for pipelines used outdoor shall be two coats of epoxy primer with two coats of PU finish. Paint finish for pipelines used indoor shall be two coats of zinc chromate primer with two coats of enamel over coat.
 - (d) Only UV stabilized SMC/ die-cast aluminum/ GI powder coated enclosures with minimum ingress protection of IP65 may be used outdoor.
7. No work shall be initiated without getting the work method statement approved by the Engineer-in-Charge. Work shall be executed only as per the approved work method statement.
8. Bad workmanship will not be accepted. Such work is liable for rejection and shall be rectified by the contractor at his own cost as per the specifications and directions given by the engineer-in-charge.
9. All repairs and patch works shall be neatly carried out to match with the original finish and to the full satisfaction of the engineer-in-charge.
10. On completion of the installation, the contractor shall arrange for conducting pre-commissioning tests as required by the applicable codes. A report of such tests shall be compiled and submitted to the engineer-in-charge for his approval. Such tests shall commence only on the approval of this report by the engineer-in-charge and shall be carried out by those authorized, skilled, experienced and certified permit holders of the supervisor category.
11. The contractor has to make his own arrangement for stores and watch and ward and no extra claim for this will be entertained.
12. The contractor has to make his own arrangement at his own cost for all the general and special T&P required on this work.
13. The contractor has to make his own arrangement for power supply required for execution of the work.

14. The contractor has to make his own arrangement for water supply required for execution of the work.
15. All the debris due to the works shall be removed from the site by the contractor as soon as the work is completed.
16. The materials used in the work shall be of approved make as per preferred make list.
17. **Defect Liability Period:** All equipment shall be guaranteed for a period of **12 Months** from the date of completion. Any defective materials and equipment shall be replaced free of cost at the direction of the Engineer-in-Charge during this period. In case it is felt by the department that undue delay is being caused by the contractor in carrying out these works, the same will be got done by the department at the risk and cost of the contractor. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.
18. **Five year OEM warranty from the date of commissioning shall be availed by the contractor for all LED fittings used in the work. A letter/ undertaking from the OEM shall be submitted in support of this. If this condition is not fulfilled by the contractor, 5% of the cost of LED fittings will be forfeited from the security deposit deducted for the total work and balance amount only will be refunded after completion of defect liability period.**
19. The work involves partial work executed by a separate agency. On award of work, before taking up execution of any work, the contractor shall carry out the following activities:
 - a) Measure up all partial work and submit the measurements for acceptance by the department.
 - b) Identify unserviceable/ defective items of work/ materials and submit measurements of these separately for acceptance by the department.
 - c) On receipt of the above details, the department will identify works or materials so measured as being unserviceable (decision of the Engineer-in-charge in this regard shall be final and binding).
 - d) Contractor shall dismantle such items as decided by the department to be unserviceable and bring the dismantled items to a designated place within the campus. Proper account of such materials shall be maintained by the contractor. Any deviation between measured quantity and dismantled item account will be adjusted from the contractors bill.
 - e) The balance work shall be taken up only on the completion of the above activities.

20. If certain items of work executed by the contractor includes certain partial works already executed, the amount of such partial work will be recovered from the amount payable to the contractor. The amount of such partial work will be calculated at market rates on the last day of submission of bid. The rate fixed by the engineer-in-charge in this regard shall be final and binding on the contractor.
21. Additional conditions and technical specifications for various components of work to be executed are given in the following sections.

22. Order of Preference:

Should there be any difference or discrepancy between the description of items as given in the Schedule of Quantities, technical specifications for individual items of work (including additional and commercial conditions) and IS Codes etc., the following order of preference shall be followed:

- a) Description of Schedule of quantities.
- b) Particular specification and Special conditions
- c) Drawings.
- d) CPWD General Specifications of that particular work.
- e) Relevant IS or any other International code in case IS code is not available.

ADDITIONAL CONDITIONS FOR ELECTRICAL WORKS

A) WIRING SYSTEM

1. Recessed/ slab wiring shall be done using medium class PVC conduits (except for fire alarm wiring & data cabling for which specifications for open wiring may be followed).
2. Open wiring shall be done using GI conduits.
 1. Surface conduits shall be supported using spacer bar saddles.
 2. Suspended conduit runs shall be supported using GI strut channel support system. Final connections to equipment from rigid wiring shall be made using GI flexible conduits.
 3. All sections of metallic conduits shall be effectively bonded to the earthing system.
3. Perforated/ ladder/ wire mesh cable trays may be used for horizontal and vertical distribution of cables.
 1. Cable trays shall be hot dipped galvanized including all connection/ support accessories.
 2. All cable tray systems shall be complete with factory made bends, tees, reducers etc and other accessories like connectors, earth clamps, support channels & suspenders, stainless steel cable ties etc.
4. Wiring system shall be complete with all necessary clamps, glands, lugs, connectors, labeling ferrules etc. When different systems of wiring are combined in a single feeder/ circuit, the transition shall be made using suitable glands/ adapters. Nothing extra is payable on this account.
5. **All flexible copper wires used shall have Class 2 copper conductor satisfying the resistance requirements of NEC 2023 Part 1 Section 17, Annex B.**
6. **All flexible copper wires used shall be with FR-LSH PVC insulation.**
7. Wherever light fittings/ fire detectors/ response indicators are proposed to be provided on the false ceiling, the respective wiring shall be brought upto the terminal of the light fittings/ fire detectors/ response indicators. Flexible metal conduits properly glanded to junction boxes shall be used for drawing wires from junctions on ceiling to fittings on false ceiling and nothing extra shall be paid to the contractor for the same.
8. Power cables run under ground with protection shall be laid direct in ground with protection tiles as per IS 5820.
9. Entry of cables into the building shall be through suitable sleeves which shall be sealed after the drawing of cables using waterproof sealing compound/ foam. Nothing extra is payable on this account.

B) LABELLING

1. GENERAL

1. Labelling scheme including sample labels for various equipment forming part of the installation shall be prepared by the contractor and submitted to the engineer-in-charge for his approval. Labelling activities may be taken up only on the approval of this plan by the engineer-in-charge.

2. CABLES

1. All cables shall be labelled showing the fed from/ fed to locations, size of cable and number of runs.
2. Stamped/ engraved aluminum labels may be used for labelling outdoor enclosures.
3. Engraved acrylic sheets may be used for labelling indoor enclosures.
4. Labels shall be connected to the cable/ conduit/ bunched wires using black nylon straps.
5. Fed to labels shall be used near feeding end.
6. Fed from label shall be used near fed end.
7. Both labels shall be used at intermediate locations inside man holes, across openings in walls etc.

3. PANELS

1. All panels shall be provided with labels on the front indicating the switch gear designation, feeding cable size & runs and destination.
2. Engraved PVC labels may be used for switch gear designation.
3. Painting may be used for remaining labelling.

4. DISTRIBUTION BOARDS

1. All DBs shall be provided with labels indicating the fed to location of loads & circuit sizes, fed from location & feeder size.
2. The DB labelling sheets must be computer printed in suitable size paper, laminated and pasted to the inside of the DB door using suitable industrial adhesive.

5. SWITCH BOARDS

1. All switch boards shall be provided with 9mm acid proof labels indicating the DB and circuit designation.
2. All circuits shall be provided with ferrules on both sides including all loops indicating the circuit, loop and DB designations.

6. WARNING LABELS

1. Approved acid proof graphic labels shall be provided at the following locations.
 - a. Near lightning down conductor locations indicating minimum distance of 3m to be maintained in the event of lightning.
 - b. In front of panels and DBs warning to keep the area in front of the panel/ DB clear for 1m.
 - a. In front of panel incomers warning of the presence of multiple sources of power for panels fed from multiple feeders.
 - a. Near earthing points of enclosures and earth buses warning against disconnection of safety earth.

C) ELECTRICAL PANELS

1. GENERAL CONSTRUCTIONAL FEATURES

1. Panels shall be:
 - a. Compartmentalized as per Form 4a construction.
 - b. Dust and vermin proof construction with minimum IP42 ingress protection for indoor panels and IP54 ingress protection for outdoor panels.
 - c. Extendable on both sides.
2. Panel boards which are free floor standing should be erected on suitable M.S. channels across cable trench if the cable entry to the panel is from bottom and ready made cable trenches exist. Panels should be erected on a M.S. angle iron frame if ready made cable trenches do not exist and if the cable entry to the panel is from the bottom. All mountings in flooring / wall etc should be using anchor fasteners and G.I. hardware.
3. No equipment needing manual operation shall be located less than 250 mm above floor level. Operating levers, handles etc of highest unit shall not be higher than 1700mm.
4. Cable alleys shall be provided with suitable hinged doors. Adequate number of slotted cable support arms shall be provided for supporting the cables.
5. Metallic partitions shall be provided between adjacent cubicles, between feeder compartments, between busbar chambers and other compartments.
6. Panel shall be divided into suitable sections for convenience during shipment.
7. All doors shall be folded type. All covers and doors may be provided with neoprene gaskets and quarter turn metallic locks (triangular/ square).
8. Provision shall be made for shrouding the outgoing terminals for protection against accidental touch. All exposed live parts shall be totally covered by shrouds. If spreader bars are required, they shall be separated by phase barriers.

9. Wherever more than one cable has to be terminated on any incoming/ outgoing feeder the respective incoming/ outgoing terminals has to be designed in such way as to receive the required number of cables.
10. Bus bars and cable alleys shall be shrouded with FRP sheet for all connections to neighboring bays.
11. Cable entry shall be provided on top and bottom as per site requirement. All gland plates shall be made out of 3mm thick galvanized iron sheet and bonded to the earth bar using flexible/ braided copper cable with cross section equal to the earth bus

2. SHEET METAL WORK

1. The panel board shall be fabricated using suitable mild steel structural sections or pressed and shaped cold rolled sheet steel of thickness not less than 2 mm. Stiffeners shall be provided wherever necessary.
2. All panel edges and door edges shall be reinforced against distortion by rolling, bending or by the addition of welded reinforced members. Cut-outs shall be true in shape and devoid of sharp edges. The complete structure shall be rigid, self-supporting and free from vibration, twists and bends.

3. PAINTING

1. All sheet steel work shall be phosphate with applicable standards. All metal works shall be chemically treated with 7 tank process for degreasing, derusting, phosphating and applied with two coats of Epoxy powder coating.

4. BUSBARS

1. Bus bars shall be of sufficient cross-section so that a current density of 130A/sq.cm is not exceeded at nominal current rating for aluminium bus bars, and 160A/sq.cm for copper bus bars.
2. The panel shall be provided with three phase and neutral busbar. Busbar shall be of uniform cross section throughout the length of the bus bar section.
3. All bus bar and bus-taps shall be insulated with color coded heat shrinkable PVC insulation sleeves.
4. Busbar shall be adequately supported and braced to withstand the stresses due to the specified short circuit currents. Busbar supports shall be made of fiber reinforced molded plastic material, or cast resin.

5. CONTROL WIRING

1. The control wiring shall be carried out in single core 1.1 KV grade PVC insulated control cables with stranded copper conductors of minimum cross section 1.5 sq.mm (2.5 sq.mm for CT wiring).

2. Runs of control wires within the switch-board shall be neatly bunched and suitably supported/ clamped. Ferrules shall be provided for easy identification of the control wires.
3. Control wiring shall correspond to the circuits/ sequence of operations and interlocks agreed to with the Engineer-in-Charge.
4. Not more than two connections shall be made at any one terminal
5. The wiring shall be arranged and supported in such a manner that there will be no strain on termination.

6. LABELLING

1. All panels shall be provided with labels on the front indicating the switch gear designation, feeding cable size & runs and destination.
2. Engraved PVC labels may be used for switch gear designation.
3. Painting may be used for remaining labeling.

7. EARTHING/ BONDING

1. Panel shall be provided with a set of inter connected earth bus bar running along the entire length of the board at top (where cable entry is from the top) and bottom. At either end of the earth bus, one clamp type terminal with nuts, bolts and washers shall be provided for bolting the earthing conductor.
2. The earth bus shall be of tinned copper and with minimum cross section equal to half the cross section of the phase bus bar (size may be reduced by 60% for panels with aluminium bus bars).
3. Earth bus bars shall be supported at suitable intervals. Positive connection between all the metal frames of equipment mounted in the switchboard and earth bus bar shall be provided.
4. All instrument cases shall be connected to the earth using 1100V grade, single core 2.5 sq.mm stranded, copper conductor cable.
5. All non current carrying metal hinged doors shall be bonded to the panel using 1100V grade, single core 2.5 sq.mm stranded, copper conductor cable.
6. All shielded cables used inside panels shall be bonded at both ends to the metallic case/ DIN rails using suitable bonding clamps.

8. TESTING

1. All panels shall be offered for inspection at the factory. All defects and deviations pointed out in the inspection report shall be rectified at the factory before dispatch to site. However, the Engineer-in-Charge may exercise discretion for waiving factory inspection in lieu of proper test certificates.
2. Panel shall be subjected to following tests as per relevant standards:

- a. Mechanical Operational tests for all movable parts of switch gears, breakers, tripping devices etc.
- b. Testing of interlocks, control circuit operation including timing and sequencing.
- c. Insulation resistance test.
- d. Over voltage withstand test.

D) LED LUMINARIES

1. ANSI/IES LM79, ANSI/IES LM-80 & ANSI/IES TM-21 test reports, IES file and datasheets shall be submitted for all luminaries. Only test reports conducted in NABL accredited laboratories will be accepted.
2. All Luminaries supplied shall have serial numbers or batch code.
3. Luminaries shall be ISI marked as per IS 10322 and conform to IS 16101 to 16108 amended upto date.
4. LEDs shall be low power LEDs of the following makes only - Nitchia, Osram, Philips or manufactured by the OEM in the list of approved makes.
5. Luminaire efficacy of not less than the following
 1. Streetlights: 120 lumen/watt
 2. Panel light, Downlighter, Batten, Industrial fittings, Flood light: 100 lumen/watt.
 3. Other: 80 lumen/watt
6. Minimum Color rendering index (Ra) should be
 1. 70 for streetlights, flood lights, industrial lights and outdoor lights.
 2. 80 for all indoor lights.
7. Correlated Color Temperature (CCT) shall be 5700 K unless otherwise mentioned.
8. The L70B50 life of LED package as per TM-21 report shall be not less than 50,000 Hrs.
9. Light fittings used for outdoor and industrial use shall have minimum IP65 ingress protection, IK08 mechanical impact protection and 4 kV surge protection.
10. OEM accessories and supports shall be used for mounting and suspending luminaries.

(b) **PASSENGER LIFT**

1.0 **General**

1.1 This specification covers manufacture, testing as may be necessary before dispatch, delivery at site, all preparatory work, assembly and installation, commissioning putting into operation **of 4 Nos of 13 Passenger Lifts.**

1.2 **Location:** - The Lift will be installed at **GPOA, Kendriya Bhavan, Kakkanad, Kochi, Kerala..**

1.3 The work shall be executed as per CPWD General Specification for Electrical Works (Part III Lifts & Escalators-2003) as per relevant IS and as per directions of Engineer-in-Charge. These additional specifications are to be read in conjunction with above and in cash of variations; specification given in this Additional condition shall apply. However, nothing extra shall be paid on account of these additional specification & conditions as the same are to be read along with schedule of quantities for the work.

1.4 The tender should in his own interest visit the site and familiarizes himself with the site conditions before tendering.

1.5 No. T&P shall be issued by the Department and nothing extra shall be paid on account of this.

2.0 **TERMS OF PAYMENT**

2.1 The following percentage of contract rates for the various item included in the contract shall be payable against the stage of work shown herein.

2.2 70% after initial inspection and delivery at site in good condition on pro-rates basis.

2.3 15% after completion of installation in all respects.

2.4 10% after testing, commissioning.

2.5 5% will be paid handing over to the department for beneficial use
Security Deposit: Security Deposit shall be deducted from each running bill and the final bill to the extend of 10% of the gross amount payable subject to maximum limit of 5% of the tendered value of work. The earnest money deposit shall be adjusted against this security deposit. The security deposit and performance guarantee shall be released on the successful expiry of guarantee period stipulated in the contract.

3.0 Rates.

- 3.1 The rates quoted by the tenderer, shall be firm and inclusive of all taxes (including works contract taxes), duties and levies and all charges for packing forwarding, insurance, freight and delivery, installation, testing, commissioning etc. at site i/c temporary constructional storage, risks, overhead charges general liabilities / obligations and clearance from local authorities. However, the fee for these inspections shall be borne by the department.
- 3.2 The contractor has to carry out routine & preventive maintenance for 12 months from the date of handing over. Nothing extra shall be paid.
- 3.3 Octroi duty shall not be paid separately but octroi exemption certificate can be furnished by the department on demand. However, the department is not liable to re-imbursement the octroi duty in case exemption certificates are not honored by the concerned authorities.

4.0 Completeness of Tender:

All sundry equipment, fittings, unit assemblies, accessories, hardware items, foundation bolts, termination lugs for electrical connections, and all other items which are useful and necessary for efficient assembly and installation of equipment and components of the work shall be deemed to have been included in the tender irrespectively of the fact whether such items are specifically mentioned in the tender documents or not.

- 5.0 For item/equipment requiring initial inspection at manufacturer's work's the contractor will intimate the date of testing of equipments at the manufacturer's work before dispatch. The department also reserves the right to inspect the fabrication job at factory and the successful tenderer has to make the arrangement for the same. The successful tenderer shall be give sufficient advance notice regarding the dates proposed for such tests/inspection to the department representative(s) to facilities his presence during testing/fabrication. The cost of the Engineer's visit to the factory will be borne by the Department. Also equipment may be inspected at the Manufacturer's premises, before dispatch to the site by the contractor.

6.0 Storage and custody of materials:

The lift machine room may be used for storage of sundry materials and creation equipments if available or else the agency has to make his own arrangement. No separate storage accommodation shall be provided by the department. Watch and ward of the stores and their safe custody shall be the responsibility of the contractor till the final taking over of the installation by the department.

7.0 **Care of the Building:**

Care shall be taken by the contractor while handing and installation the various equipments and components of the work to avoid damage to the building. He shall be responsible for repairing all damage and restoring the same to their original finish at his cost. He shall also remove at his cost all unwanted and waste materials arising out of the installation from the site of work.

8.0 **Completion of period:**

The completion of the period of **04 Months**, indicated in the tender documents is for the entire work of planning, designing, supplying, installation, testing, commissioning and handing over the entire system to the satisfaction of the Engineer-in-charge.

9.0 **Performance Guarantee:**

9.1 The tender shall guarantee among other things, the following.

- (a) Quality, strength and performance of the material used.
- (b) Safe mechanical and electrical stress on all parts under all specified condition of operation.
- (c) Satisfactory operation during the maintenance period.

9.2 The successful tenderer shall submit an irrevocable **performance guarantee of 5%** of the tendered amount in addition to other deposits mentioned elsewhere in the contractor for his proper performance of the contractor agreement within 7 days of issue of letter of internet. This guarantee shall be in form of cash (in case guarantee amount is less than Rs. 10,000/0) or Deposit at Call receipt of any scheduled bank/Banker's cheque of any scheduled bank/Demand Draft of any scheduled bank/Pay Order of any schedule bank (in case guarantee, amount is less than Rs.1,00,000.00) or Government securities or fixed deposit receipts or guarantee bonds of any schedule bank of the State bank of India in the specified format. The performance guarantee shall be initially valid up to the stipulated date of completion plus 13 months beyond Bank Guarantee should be kept valid till the Guarantee period successfully completed.

10.0 Guarantee

10.1 All equipments shall be guaranteed for period of 12 months from the date of taking over the installation by the department against unsatisfactory performance and/or break down due to defective design, workmanship of materials. The equipments or components, or any part thereof, so found defective during guarantee period shall be forth with repaired free of cost, to the satisfaction of the Engineer-in-charge. In case it is felt by the department that undue delay is being caused by the contractor in doing this, the same will be got done by the department at the risk and cost of contractor. The decision of the Engineer-in-charge in this regard shall be final.

11.0 Power Supply.

Electrical service connection of 415 V, 3 phases, 4 wires, 50 Hz, Ac supply shall be arranged by the agency for installation purpose. However power supply for testing and commissioning shall be arranged by the department of free of cost.

12.0 Water Supply

Water supply shall be made arranged by the agency themselves.

13.0 Data Manual and Drawings to be furnished by the tenderers.

13.1 With Tender: The tenderer shall furnish along with the tender, detailed technical literature, pamphlets and performance data for appraisal and evaluation of the offer.

13.2 After Award of work

- (i) The successful tenderer would be required to submit the following drawings within a month of award of work for approval before commencement of installation.
 - (a) All general arrangement drawings.
 - (b) Details of foundations for the equipment, load data, location etc. of various assembled equipments as may be needed generally by other agencies for purpose of their work. The data will include breaking load on guides, reaction of buffers on lift pits reaction on support points in machine room, lift well etc.
 - (c) Complete layout dimensions for every unit/group of units with dimension required for erection purposes.

- (d) Any other drawing/information not specifically mentioned above but deemed to be necessary for the job by the contractor.

14.0 The successful tenderer should furnish well in advance three copies of details instruction and manuals of manufactures for all items of equipments regarding installation, adjustments operation and maintenance i/c preventive maintenance & trouble shooting together with all the relevant data sheets. Spare parts catalogue and workshop procedure for repairs, assembly and adjustment etc. all in triplicate.

15.0 Extent of Work

- 15.1 The work shall comprise of entire labour including supervision and all materials necessary to make a complete installation and such tests and adjustment and commissioning as may be required by the department. The term complete installation shall not only mean items of the plant and equipments covered by specifications but all incidental sundry components necessary for complete execution and satisfactory performance of installation with all layout charts weather or not those have been mentioned in details in the tender document in connection with this contract.
- 15.2 Minor building works necessary for installation of equipment, foundation, making of opening in walls or in floors and restoring to there original conditions, finish and necessary grouting etc. as required.
- 15.3 Maintenance (Routine & preventive) for one year from date of completion and handing over.
- 15.4 The work is turnkey project and item required for completion of the project but left in-advertantly shall be executed within the quoted rates.

16.0 Inspection and testing:

- 16.1 Copies of all documents of routine and type test certificates of the equipment, carried out at the manufacturers premises shall be furnished to the Engineer-in-charge and consignee.
- 16.2 After completion of work in all respect the contractor shall offer the installation for testing and operation.
- 16.3 After the satisfactory final testing as per CPWD General specification part-III (Lifts & escalator) 2003, the contractor shall demonstrate the trouble free running of the lift installation for a period of 30 working days before the department takes over for the beneficial use. During this period the lift shall be kept in either automatic or manual code by the

department. The date of taking over the installation/acceptance shall be after 30days of trouble free operation as mentioned above.

17.0 Validity

Tenders shall be valid for acceptance for a period of **30 days** from the date of opening of price bid.

18.0 Compliance with Regulations and Indian standards

18.1 All works shall be done carried out in accordance with relevant regulation, both statutory and those specified by the Indian standards related to the works covered by the specification. In particular, the equipment and installation will comply with the following:

- (i) Factories Act.
- (ii) Indian electricity Rules
- (iii) I.S & BS Standards as applicable
- (iv) Workmen's compensation Act
- (v) Statutory norms prescribed by local bodies.

18.2 Nothing in this specification shall be constructed to relieve the successful tenderer of his responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with currently applicable statutory regulations and safety codes.

18.3 Successful tenderer shall arrange for compliance with statutory provisions of safety regulations and department requirements of safety codes in respect of labour employed on the work by the tenderer. Failure to provide such safety requirement would make the tenderer liable for penalty of Rs. 500/- for each default. In addition, the department will be at liberty to make arrangement for the safety requirements at the cost of tendering and cover the cost thereof from him.

19.0 Indemnity

The successful tenderer shall at all indemnity the department, consequent on this works contract. The successful tenderer shall be liable, in accordance with Indian Law and Regulations for any accident or damage incurred or claims arising there from during the period of erection, construction and putting into operation the equipment and ancillary equipment under the supervision of the successful tenderer in so far as the letter is responsible. The successful tenderer shall also provide all insurance including third party insurance as may be necessary to cover the risk. No extra payment would be made to the successful tenderer due to the above.

20.0 Erection Tools

No tools and tackles either for unloading or for shifting the equipment for erection purposes would be made available by the department. The successful tenderer shall make his own arrangement for all these facilities.

21.0 Co-operation with other agencies.

The successful tender shall co-ordinate with other contractor and agencies engaged in the construction of building, if any, and exchanges freely all technical information so as to make the execution of this works contracts smooth. No remuneration should be claimed from the department for such technical cooperation. If any unreasonable hindrance is caused to other agencies and any completed portion of the work has to be dismantled and re-done for want of cooperation and coordination by the successful tenderer during the course of work, such expenditure incurred will be recovered from the successful tenderer if the restoration work to the original condition or specifications of the dismantled portion of the work was not undertaken by the successful tenderer himself.

22.0 Mobilization advance

No mobilization advance shall be paid for this work.

23.0 Insurance and storage

All consignments are to be duly insured up to the destination from warehouse to warehouse at the cost of the supplier. The insurance covers shall be valid till the equipment is handed over duly installed, tested and commissioned.

24.0 Verification of correctness of Equipment at Destination.

The contractor shall have to produce all relevant records to certify that the genuine equipment from the manufacturers has been supplied and erected.

25.0 Painting

This shall include cost of painting of entire exposed iron work complete in the installation. All equipments work shall be painted at the works before dispatch to the site.

26.0 Training

The scope of works includes on job technical of two persons at site. Noting extra shall be payable on this account.

27.0 Maintenance

27.1 Sufficient trained and experienced staff shall be made available to meet any exigency of work during the guarantee period of one year from the handing over of the installation.

27.2 The maintenance, routine as well as preventive for one year from the date of taking over the installation as per manufactures recommendation shall be carried out and the record of the same shall have to be maintained.

27.3 **Separate Maintenance contract agreement shall be executed with the Manufacturer of lift for Annual comprehensive maintenance of the lift which include routine preventive, break down maintenance, repair, replacement of worn out items including lamps, batteries for ARD and Lighting system etc. with minimum down time for a period of five years after completion of one year of guarantee period. The payment for the Annual comprehensive maintenance shall be made quarterly at the end of each quarter.**

28.0 Interpreting Specifications

In interpreting the specifications, the following order of decrease important shall be followed in case of contradictions:

- (a) Schedule of quantities
- (b) Technical specifications
- (c) Drawing (if any)
- (d) General Specifications
- (e) Relevant IS or other international code in case IS code is not available.

Assistant Engineer (E) (P)
O/o EE(E)-Kochi, CPWD, Kochi

Executive Engineer (E) - Kochi
CPWD, Kochi

PARTICULAR SPECIFICATIONS OF PASSENGER LIFT**(a) 13 Passenger Lift (G+6) at 'A' Block with Machine Room**

SI No.	Description	Minimum Specifications
1	Type of Lift	Passenger Lift
2.	Country of Manufacturer	India
3	No. of Lifts	1 No.
4	Load / No. of persons	884 Kgs/ 13 persons / P- Passengers
5	Type of Motor	Permanent Magnet Synchronous motor (Gearless)
6	Drive System	Microprocessor based VVVF
7	Rated speed	1.5 MPS
8	Travel Height in meters	18 mtrs. (Approx.)
9	Number of Floors Served	7 Floors (G+6 Upper Floors)
10	Shaft Width x Shaft Depth	2560 mm Wide x 1880 mm Deep.(Approx.)
11	Overhead	5000 mm
12	Pit Depth	1600 mm
13	Car Width x Car Depth	1500 mm x 1500 mm
14	Car Height	2200 mm
15	No of Door panels	2 Panel
16	Type of Door Drive	Linear Door Drive System
17	Type of operation	Microprocessor based Simplex selective collective with or without attendant.
18	Potential free contacts	Required for each floor position and up & down movement of the lift for building automation & Central Indicating Panel.
19	Car Entrance door	
19.1	Number	1 No. front opening stainless steel Moon rock finish, 1.5mm thick, 304 Grade Stainless Steel Panel.
19.2	Size	900 mm wide x 2000 mm high
19.3	Type of door	Power Operated Centre Opening sliding door
19.4	Car open in front only or open through	Open in front only
19.5	Operation	Power operated with full door length infra-red beam detecting system
20	Construction Design & finish of Car	Stainless Steel scratch proof Moon rock finish for front & sides (1.5mm thick, 304 Grade)

		Stainless Steel Moon rock finish frame work for Rear panel with body work and drop ceiling. Hand rail on all the three sides at 900mm above floor level to be fixed in the Lift car. LED light fittings with illumination level of not less than 150 Lux and 1 No circular fan inside the car, 5mm thick antiskid PVC flooring. All other items as per CPWD General Specifications for Lifts 2003.
21	Type of signal system	(a) Digital floor position indicator in the car and at all landings (b) Travel direction indicator in the car and at all landings. (c) Gongs & visual indication through directional arrows on all landings for pre-arrival of the car at all floors. (d) Overload warning Audio & Visual indicator, inside the car (lift should not start on overload) (e) Battery operated alarm bell and emergency light & car light duly fed by a suitable inverter with SMF batteries for 30 minutes backup. (f) Car operating panel with fade proof luminous buttons, Braille switch with intercom. (g) Luminous call buttons at all landings with Braille switches & Landing call registered indicator at all floors. (h) Fireman's switch at ground floor. (i) Voice annunciation system. This will announce the position of the car landing in Hindi & English besides facilities for any other announcement to be made from the central control room/ reception of the building. (j) Intercom system with inbuilt intercom in the car and two phones (One each at Ground floor & Control panel).
22	Landing Entrance	
22.1	Location of Landing entrance on different floors	All doors on the same side
22.2		
22.3	Size	900 mm wide x 2000 mm high

22.4	Type of Doors	Horizontal Sliding - Side Opening Stainless Steel Moonrock finish, 1.5mm thick, 304 grade, Stainless Steel panel.
22.5	Lift in Use/ Lift out of Order Sign	A suitable box above the landings with LED illuminated bilingual (in English & Hindi) sign of "LIFT OUT OF ORDER" coming up simultaneously on all floors.
23	Electric supply	(a) Power: 415 V, A.C., 50 Hz, 3 phase system.
		(b) Lighting: 220 V, A.C., 50Hz, LNE
24	Is neutral wire available for control circuits	Yes
25	Additional items-	
25.1	Location of main switch	In Machine Room
25.2	Overload warning indicator	Required
25.3	Ventilation opening in the Car Body	Required.
25.4	Operating panel inside Car	Automatic cum manual flush mounted with luminous Braille switches suitable for barrier free environment for differently able persons.
25.5	Fireman's Switch	Required.
25.6	Emergency power supply	Available.
25.7	Automatic Rescue Device (ARD)	Automatic Rescue Device for the purpose of bringing the lift car to the nearest floor should be provided one each lift. ARD shall consist of:
		(a) Control panel with necessary interface/ integration of device with the main controller.
		(b) Inverter of required capacity.
		(c) Maintenance free batteries of required Ampere-hours capacity.
		(d) Battery charging unit.
		(e) "Rescue Operation on" indicator in the lift car.
25.8	Battery operated Emg Alarm Light	Required
25.9	Fire rating of landing doors	One Hour

25.10	Safe landing operation & next landing operation	Required
25.11	Door Protection	Infra Red Door screen
25.12	Progressive Type Safety gear for car	Required
25.13	Counter Weight safety type	Buffer Spring
25.14	Types of Door interlocks in car	Electrical /Electro mechanic
25.15	Disabled friendly features	Required
25.16	Two way Intercom with press & Speak In cop	Required
25.17	Pit ladder	Required
25.18	Floor Annunciator	Required

(b) 13 Passenger Lift (G+7) at C3 Block with Machine Room - 01 No

SI No.	Description	Minimum Specifications
1	Type of Lift	Passenger Lift
2.	Country of Manufacturer	India
3	No. of Lifts	1 No.
4	Load / No. of persons	884 Kgs/ 13 persons / P- Passengers
5	Type of Motor	Permanent Magnet Synchronous motor (Gearless)
6	Drive System	Microprocessor based VVVF
7	Rated speed	1.5 MPS
8	Travel Height in meters	21 mtrs. (Approx.)
9	Number of Floors Served	8 Floors (G+7 Upper Floors)
10	Shaft Width x Shaft Depth	2560 mm Wide x 1860 mm Deep.(Approx.)
11	Overhead	5000 mm
12	Pit Depth	1600 mm
13	Car Width x Car Depth	1500 mm x 1500 mm
14	Car Height	2200 mm
15	No of Door panels	2 Panel
16	Type of Door Drive	Linear Door Drive System
17	Type of operation	Microprocessor based Simplex selective collective with or without attendant.
18	Potential free contacts	Required for each floor position and up & down movement of the lift for building automation & Central Indicating Panel.
19	Car Entrance door	

19.1	Number	1 No. front opening stainless steel Moon rock finish, 1.5mm thick, 304 Grade Stainless Steel Panel.
19.2	Size	900 mm wide x 2000 mm high
19.3	Type of door	Power Operated Centre Opening sliding door
19.4	Car open in front only or open through	Open in front only
19.6	Operation	Power operated with full door length infra-red beam detecting system
20	Construction Design & finish of Car	Stainless Steel scratch proof Moon rock finish for front & sides (1.5mm thick, 304 Grade) Stainless Steel Moon rock finish frame work for Rear panel with body work and drop ceiling. Hand rail on all the three sides at 900mm above floor level to be fixed in the Lift car. LED light fittings with illumination level of not less than 150 Lux and 1 No circular fan inside the car, 5mm thick antiskid PVC flooring. All other items as per CPWD General Specifications for Lifts 2003.
21	Type of signal system	(a) Digital floor position indicator in the car and at all landings
		(b) Travel direction indicator in the car and at all landings.
		(c) Gongs & visual indication through directional arrows on all landings for pre-arrival of the car at all floors.
		(d) Overload warning Audio & Visual indicator, inside the car (lift should not start on overload)
		(e) Battery operated alarm bell and emergency light & car light duly fed by a suitable inverter with SMF batteries for 30 minutes backup.
		(f) Car operating panel with fade proof luminous buttons, Braille switch with intercom.
		(g) Luminous call buttons at all landings with Braille switches & Landing call registered indicator at all floors.
		(h) Fireman's switch at ground floor.
		(i) Voice annunciation system. This will

		announce the position of the car landing in Hindi & English besides facilities for any other announcement to be made from the central control room/ reception of the building. (j) Intercom system with inbuilt intercom in the car and two phones (One each at Ground floor & Control panel).
22	Landing Entrance	
22.1	Location of Landing entrance on different floors	All doors on the same side
22.2		
22.3	Size	900 mm wide x 2000 mm high
22.4	Type of Doors	Horizontal Sliding - Side Opening Stainless Steel Moonrock finish, 1.5mm thick, 304 grade, Stainless Steel panel.
22.5	Lift in Use/ Lift out of Order Sign	A suitable box above the landings with LED illuminated bilingual (in English & Hindi) sign of "LIFT OUT OF ORDER" coming up simultaneously on all floors.
23	Electric supply	(a) Power: 415 V, A.C., 50 Hz, 3 phase system.
		(b) Lighting: 220 V, A.C., 50Hz, LNE
24	Is neutral wire available for control circuits	Yes
25	Additional items-	
25.1	Location of main switch	In Machine Room
25.2	Overload warning indicator	Required
25.3	Ventilation opening in the Car Body	Required.
25.4	Operating panel inside Car	Automatic cum manual flush mounted with luminous Braille switches suitable for barrier free environment for differently able persons.
25.5	Fireman's Switch	Required.
25.6	Emergency power supply	Available.
25.7	Automatic Rescue Device (ARD)	Automatic Rescue Device for the purpose of bringing the lift car to the nearest floor should be provided one each lift. ARD shall consist

		of:
		(a) Control panel with necessary interface/ integration of device with the main controller.
		(b) Inverter of required capacity.
		(c) Maintenance free batteries of required Ampere-hours capacity.
		(d) Battery charging unit.
		(e) "Rescue Operation on" indicator in the lift car.
25.8	Battery operated Emg Alarm Light	Required
25.9	Fire rating of landing doors	One Hour
25.10	Safe landing operation & next landing operation	Required
25.11	Door Protection	Infra Red Door screen
25.12	Progressive Type Safety gear for car	Required
25.13	Counter Weight safety type	Buffer Spring
25.14	Types of Door interlocks in car	Electrical /Electro mechanic
25.15	Disabled friendly features	Required
25.16	Two way Intercom with press & Speak In cop	Required
25.17	Pit ladder	Required
25.18	Floor Annunciator	Required

(b) 13 Passenger Lift (G+7) at C1 Block with Machine Room - 02 Nos

SI No.	Description	Minimum Specifications
1	Type of Lift	Passenger Lift
2.	Country of Manufacturer	India
3	No. of Lifts	1 No.
4	Load / No. of persons	884 Kgs/ 13 persons / P- Passengers
5	Type of Motor	Permanent Magnet Synchronous motor (Gearless)
6	Drive System	Microprocessor based VVVF
7	Rated speed	1.5 MPS
8	Travel Height in meters	21 mtrs. (Approx.)
9	Number of Floors Served	8 Floors (G+7 Upper Floors)
10	Shaft Width x Shaft Depth	2560 mm Wide x 1860 mm Deep.(Approx.)

11	Overhead	5000 mm
12	Pit Depth	1600 mm
13	Car Width x Car Depth	1500 mm x 1500 mm
14	Car Height	2200 mm
15	No of Door panels	2 Panel
16	Type of Door Drive	Linear Door Drive System
17	Type of operation	Microprocessor based Duplex selective collective with or without attendant.
18	Potential free contacts	Required for each floor position and up & down movement of the lift for building automation & Central Indicating Panel.
19	Car Entrance door	
19.1	Number	1 No. front opening stainless steel Moon rock finish, 1.5mm thick, 304 Grade Stainless Steel Panel.
19.2	Size	900 mm wide x 2000 mm high
19.3	Type of door	Power Operated Centre Opening sliding door
19.4	Car open in front only or open through	Open in front only
19.6	Operation	Power operated with full door length infra-red beam detecting system
20	Construction Design & finish of Car	Stainless Steel scratch proof Moon rock finish for front & sides (1.5mm thick, 304 Grade) Stainless Steel Moon rock finish frame work for Rear panel with body work and drop ceiling. Hand rail on all the three sides at 900mm above floor level to be fixed in the Lift car. LED light fittings with illumination level of not less than 150 Lux and 1 No circular fan inside the car, 5mm thick antiskid PVC flooring. All other items as per CPWD General Specifications for Lifts 2003.
21	Type of signal system	(a) Digital floor position indicator in the car and at all landings
		(b) Travel direction indicator in the car and at all landings.
		(c) Gongs & visual indication through directional arrows on all landings for pre-arrival of the car at all floors.
		(d) Overload warning Audio & Visual indicator,

		inside the car (lift should not start on overload)
		(e) Battery operated alarm bell and emergency light & car light duly fed by a suitable inverter with SMF batteries for 30 minutes backup.
		(f) Car operating panel with fade proof luminous buttons, Braille switch with intercom.
		(g) Luminous call buttons at all landings with Braille switches & Landing call registered indicator at all floors.
		(h) Fireman's switch at ground floor.
		(i) Voice annunciation system. This will announce the position of the car landing in Hindi & English besides facilities for any other announcement to be made from the central control room/ reception of the building.
		(j) Intercom system with inbuilt intercom in the car and two phones (One each at Ground floor & Control panel).
22	Landing Entrance	
22.1	Location of Landing entrance on different floors	All doors on the same side
22.2		
22.3	Size	900 mm wide x 2000 mm high
22.4	Type of Doors	Horizontal Sliding - Side Opening Stainless Steel Moonrock finish, 1.5mm thick, 304 grade, Stainless Steel panel.
22.5	Lift in Use/ Lift out of Order Sign	A suitable box above the landings with LED illuminated bilingual (in English & Hindi) sign of "LIFT OUT OF ORDER" coming up simultaneously on all floors.
23	Electric supply	(a) Power: 415 V, A.C., 50 Hz, 3 phase system.
		(b) Lighting: 220 V, A.C., 50Hz, LNE
24	Is neutral wire available for control circuits	Yes
25	Additional items-	
25.1	Location of main switch	In Machine Room

25.2	Overload warning indicator	Required
25.3	Ventilation opening in the Car Body	Required.
25.4	Operating panel inside Car	Automatic cum manual flush mounted with luminous Braille switches suitable for barrier free environment for differently able persons.
25.5	Fireman's Switch	Required.
25.6	Emergency power supply	Available.
25.7	Automatic Rescue Device (ARD)	Automatic Rescue Device for the purpose of bringing the lift car to the nearest floor should be provided one each lift. ARD shall consist of:
		(a) Control panel with necessary interface/ integration of device with the main controller.
		(b) Inverter of required capacity.
		(c) Maintenance free batteries of required Ampere-hours capacity.
		(d) Battery charging unit.
		(e) "Rescue Operation on" indicator in the lift car.
25.8	Battery operated Emg Alarm Light	Required
25.9	Fire rating of landing doors	One Hour
25.10	Safe landing operation & next landing operation	Required
25.11	Door Protection	Infra Red Door screen
25.12	Progressive Type Safety gear for car	Required
25.13	Counter Weight safety type	Buffer Spring
25.14	Types of Door interlocks in car	Electrical /Electro mechanic
25.15	Disabled friendly features	Required
25.16	Two way Intercom with press & Speak In cop	Required
25.17	Pit ladder	Required
25.18	Floor Annunciator	Required

ADDITIONAL & SPECIAL CONDITIONS FOR LIFT AMC

1. Maintenance contract agreement will be executed with the Lift Manufacturer and Client directly after completion of one year defect liability period. It is the responsibility of the contractor to get the supplementary agreement executed by the manufacturer for the same amount of his agreement. SD will be released only after the same.
2. The firm has to depute trained maintenance staff / authorized person only for safe operation of lift.
3. The firm has to carry out monthly servicing adjustments, lubricants, repair or replacement of necessary parts and make entries accordingly in the maintenance schedule book of the lift kept with JE (E) in charge.
4. Monthly checking includes Door Assembly, Lift Car, Controller, ARD, Traction system etc. and Check Report should be submitted to the Engineer - In - Charge.
5. Breakdown calls to be attended free of cost when occurs.
6. Land line / Mobile Number of the technician to be displayed in the lift car / Door side in every floor.
7. The rates are inclusive of GST and other Taxes.
8. Responsibility for comprehensive maintenance of lift in sound condition except its daily operation shall be in scope of the contract.
9. The lift operator, Junior Engineer (E) and the Assistant Engineer (E) are the authorized officials of department for reporting the complaints either over telephone / in writing / in person and they are also authorized to sign service reports. However, gate pass for removal of any company materials from site shall require the signature of the JE(E) / AE(E) or persons authorized by them.
10. A log book shall be maintained and details of servicing as well as break down calls attended should be recorded in the log book with the date and time of complaint as well as date and time of attending / rectification, scheduled services carried out and this should be signed by the complainant as well as the representative of the contractor.
11. Genuine materials of Lift OEM or third party vendors authorized by lift manufacturer should only be used in the work for service and repairs. The department reserves right to reject if it is found sub standard and does not conform to relevant standards.

12. **Scope of Work:**

- a) Renew all wire ropes and chains (where fitted) as often as required to maintain an adequate factor of safety to equalize the tension on all hoisting ropes, repair or replace conductor cables and hoist way and machine room elevator wiring.
- b) Examine periodically all safety devices and governors and make all customary safety tests.
 - i. Machine, Worm Gear, Thrust Bearings, Drive Sheave, Drive Sheave Bearings, Break contract, Linings components.
 - ii. Motor, Motor Generator, Motor Windings, rotating elements, Commutator, Brushes, Brush holders, Bearings, Coils, Resistance for operating and motor circuits, magnet frames and other mechanical parts.
 - iii. Controller, Selector, Leveling, Devices, Cams, Relays, solid State components, e.g. PCB's, Transducers, Resistors, Condensers, Power amplifiers, Transformers, Contacts, Leads, Dashpots, timing Devices, Steel.
 - iv. Selector tapes and mechanical and electrical driving equipment.
 - v. Governor, governor sheave, shaft assembly, bearings, contacts and governor jaws.
 - vi. Car and hall mechanical buttons, car and hall position indicators, hall lanterns, car direction indicators and all other car and landing signal fixtures as installed.
 - vii. Deflector or secondary sheave, bearings, car and counterweight guide rails and buffers, top and bottom limit switches, governor tension sheave assembly, car counterweight guide shoes including rollers of gibs.
 - viii. Interlocks on hoist way door, hoist way door hangers, guides, automatic power operated door operator, car door hanger, car contact, accessories safety shoes, load weighting equipment, car frame, car safety mechanism and platform will be furnished will be furnished by the firm on an exchange basis under which replaced parts become the property of firm.
 - ix. In case of discontinue manufacture of any of the above mentioned items the firm will apprise the department for any modifications.

13. The firm will maintain OEM engineering wiring diagram only. The firm will provide emergency minor adjustment Call Back service at no extra charge will be extended round the clock on all working days as well as holidays. However, any other repairs or service will be performed during normal working hours on normal working days. Incase there is any extra requirement for deputing the staff on duty due to VVIP function the same will be paid extra.
14. The department will report details of unsatisfactory running or irregular performance of the equipment and will keep clean and in good condition those parts excluded from this agreement and will provide the machine room with adequate lighting, cooling, moisture control and or ventilation as may be required in the judgment of firm to assist its men in providing the work set out hereunder and in enhancing the effective operation of the equipment. The ambient temperature in the machine room should remain and will keep away from any areas enclosing mechanical or electrical equipment, persons other than firm's authorized employees.
15. The Department will provide the firm unrestricted ready access to all area of the building in which and any parts of the units are located and to keep all machine rooms and pit areas free from water, stored material and rubbish / debris.
If any unit is malfunctioning or in a dangerous condition, the department shall immediately notify the firm and until the firm rectifies the problem and to remove the unit from service and take all possible precautions to prevent its access or use.
16. The department agrees to display any publicity material relating to safety / use of equipment's and warnings to passengers in connection with the use of the elevators.
17. All the defects shall be resolved within 4 hours of informing the complaints by telephone calls. In case of major defects, the same shall be rectified most urgently within minimum required time.
18. Payment shall be made quarterly basis.
19. In case of failure to attend the complaint for more than 24 hours without reasonable cause, a prorata recovery @ Rs.1000/- per lift per day shall be made from the running account bills.
20. The firm has to maintain the lifts as per instructions of the Engineer-in-Charge or his authorized representative at site, for smooth running / operation of the lifts. The decision of the Engineer-in-Charge shall be binding and final.
21. The staff deputed by the firm shall have to abide by the security regulations of the

building.

22. It shall be firm's sole responsibility to maintain the complete lifts system up to statutory safety regulations. Failure to do so, causing an accident, resulting in payment of liquidated damage; the same shall be borne by the firm.
23. Any minor addition / alteration or change of design required for smooth and efficient working of lifts as deemed necessary by the department, shall be carried out by the firm within the quoted cost.
24. Any minor civil work involved in day to day maintenance shall be carried out by the firm within the quoted cost. Any damage caused during day to day maintenance shall be made to good to original finish, free of cost by the firm.
25. The lifts have to work in the variable ambient conditions of the environment and at normal electric supply available at lift control room. Department does not guarantee towards any improvement of environmental or electric supply conditions.
26. The firm shall keep all the lifts operative all the times, however in-case of repairs beyond reasonable control, the firm shall put the elevators in perfect serviceable conditions taking the minimum shutdown period, which will be intimated to the department at the time of such repair.
27. The firm shall be responsible for any damages due to any kind of accident, in-case it occurs when maintenance or any repair work is being executed by it.
28. Contractor shall make his own arrangement for all the tools, tackles, measuring instruments and consumables required for the execution of the work.
29. The contractor shall examine the quantum of work and shall satisfy himself before submitting tender. He shall himself assess the requirements of materials, contingencies and other circumstances which may affect his tender. No extra charges on account of any misunderstanding or otherwise shall be allowed.
30. The Contractor shall be deemed to have satisfied before tendering, as to correctness and sufficiency of his tender, the work and prices. This shall except as otherwise provided, all obligation under the contracts and all matters and things necessary for the proper completion and maintenance of the works.
31. The Contractors shall, at his own expense arrange for the safety provisions as required by the Engineer-in-charge in respect of all workers directly or indirectly employed for the work and shall provide all facilities in connection there with. In

case the contractors fails, to make arrangements and provide necessary facilities, the Engineer - in - charge shall be entitled to do so, and recover the cost there of, from the contractor.

32. The contractor shall not any time do cause or permit any nuisance on the work site or do anything which shall cause unnecessary disturbance or inconvenience to occupants.
33. Payment shall be made against submission of running bills on quarterly basis for complete work.
34. The contractor shall be responsible for any damage or theft and shall have to make good to its original shape and description as and when damage/theft etc. is noticed or taken place due to the wrong operation of the equipment's or negligence of the contractor's staff. The decision of Engineer-in-charge in this respect will be final and binding.
35. If any material is required for urgent repair(beyond routine maintenance), which is to be supplied by the department, free of cost and not available with department, the contractor has to provide the same on the written request of Engineer-In-Charge on extra cost permissible as per relevant conditions of contract.
36. If any material shall be supplied by the department to replace the faulty one, dismantled materials are to be returned back to the department after replacing the new one.
37. The department reserves the right to discontinue the contract without assigning any reason at any time with a notice of one month. No claim shall be entertained on this account.
38. The contractor has to follow the local security /safety rules and regulations prevailing in the area.

LIST OF PREFERRED MAKES

All materials and Equipment shall conform to the relevant standards and shall be of approved make and design. The list of preferred makes for various equipment/materials etc. is given below. Any item missed out from the list should be got approved by the Engineer in Charge before delivery/ installation. Engineer-in-charge may, for any item, in the interest of work allow use of any other make/brand in addition to the makes/brands mentioned in the preferred makes lists subject to its satisfactory quality and on proper grounds like non-availability of preferred makes/brands in the market etc. In such case, cost adjustment shall be made if the make/brand actually used is priced lower than the lowest priced brands of that item in the preferred makes list. However, nothing extra shall be paid if actually used brand/make is of higher price than the highest priced brand/make in the list of preferred makes.

TABLE 1: LIST OF PREFERRED MAKES FOR INTERNAL EI WORKS

SL.NO	NAME OF THE PRODUCT	MAKES
1	STEEL / MS CONDUIT & ACCESSORIES OF MS CONDUIT (ISI MARKED)	BEC / AKG / NIC / STEEL KRAFT / RMCON / GUPTA / VIMCO / JAVERI
2	PVC CONDUIT (COLOUR - GRAY/IVORY)	PRECISION / POLYCAB / AKG / FINOLEX / KONSEAL / BEC / ASIAN / NIHAR / ANCHOR PANASONIC / AVON PLAST/ MODI / VASAVI / EMJAY / JAVERI / DEC /BALCO/TOMS PIPES PVT LTD
3	PVC INSULATED FRLS COPPER CONDUCTOR CABLES 1.1 KV GRADE (ISI MARKED-CLASS-II)	FINOLEX / RR KABLE / KEI / POLYCAB / ANCHOR / ASMON / MESCAB / LAURITZ KNUDSEN / POWER FLEX / Q FLEX/BONTON
4	MODULAR TYPE SWITCH / GI BOXES / SOCKETS /TV / TELEPHONE/LAN SOCKET	LEGRAND -MYRIS- ARTEROR / SCHNEIDER -OPAL-LIVIA / MK-ELEMENTS / HAVELLS-CRABTREE-ATHENA / PANASONIC

SL.NO	NAME OF THE PRODUCT	MAKES
	OUTLET ETC. NORMAL APPLICATION	MK-LOGIC-PLUS / HONEYWELL -BENZ PLUS / ANCHOR- ROMA PLUS / SAVIC / CRABTREE-ATHENA
5	DB	LEGRAND / SCHNEIDER / SIEMENS / ABB / GE / HAGER / LAURITZ KNUDSEN/ PANASONIC BY ANCHOR / POLYCAB / C&S - EPITOME/ HAVELLS /
	MCB / ELCB / RCBO	LEGRAND-DX3 / SCHNEIDER-ACT19 / SIEMENS 5SX4 / HAVELLS / ABB / GE / HAGER / LAURITZ KNUDSEN / PANASONIC BY ANCHOR / POLYCAB / C&S (NOTE: IT SHALL BE SAME AS THAT OF DB MAKE)
	MCCB	LEGRAND-DX3 / SCHNEIDER-ACT19 / SIEMENS 5SX4 / LAURITZ KNUDSEN - D SINE / ABB / EATON / C&S (NOTE: IT SHALL BE SAME AS THAT OF DB MAKE)
6	FLOOR TRUNKING/RACEWAY(GI)	HONEYWELL MK / OBO BETTERMANN / LEGRAND / PROFAB
7	DLP TRUNKING	LEGRAND / MK / OBO BETTERMANN / SCHNEIDER

SL.NO	NAME OF THE PRODUCT	MAKES
8	INDOOR / OUTDOOR LIGHTING FIXTURES	PHILIPS / DISANO / IGGUZINI / REGENT / OSRAM / LT (LIGHTING TECHNOLOGIES)
		BAJAJ / JAQUAR / WIPRO / HAVELLS / SYSKA / CROMPTON GREAVES / POLYCAB / PANASONIC / UBITTER TECHNOLOGIES - PROLIMIN
9	LAMPS	GE / OSRAM / PHILIPS / TRILUX / LIGHTING TECHNOLOGIES
		BAJAJ / SURYA / JAQUAR / WIPRO / HAVELLS / SYSKA / CROMPTON / PANASONIC / LIGHTING TECHNOLOGIES / POLYCAB/ UBITTER TECHNOLOGIES
10	BLDC CEILING FAN	CROMPTON / ORIENT / BAJAJ / ALMONARD / ATOMBERG (5 STAR RATED -ISI MARKED)
11	EXHAUST FANS / FRESH AIR FAN / WALL FAN	CROMPTON / HAVELLS / ORIENT / BAJAJ / ALMONARD / ATOMBERG
12	XLPE INSULATED PVC SHEATHED AL, CU & CONTROL CABLES	UNIVERSAL / RPG CABLES / FINOLEX / CCI / ANCHOR PANASONIC / HAVELLS / RR KABLE / GLOSTER/ KEI / POLYCAB
13	MULTIFUNCTION METER/LOAD MANAGERS	SCHNEDER / SIEMENS / LEGRAND / SECURE / SOCOMEC (DIRIS)

SL.NO	NAME OF THE PRODUCT	MAKES
14	CABLE GLAND	PEECO / COMMET / GRIPWELL / DOWELLS / JAINSONS / PRABATH / RAYCHEM / GRANDLAY
15	LUGS AND THIMBLES	DOWELLS / MULTI / CAPITAL / JAINSONS / COMMET / PRABATH / SCHNEIDER ELECTRIC
16	G I PIPE	JINDAL / TATA / SAIL
17	POWER / CONTROL CONTACTORS	GE / LAURITZ KNUDSEN / SIEMENS / SCHNEIDER / ABB
18	ELECTRICAL SWITCHGEAR & STARTERS, RELAYS	SIEMENS / LAURITZ KNUDSEN / ABB / SCHNEIDER
19	SINGLE PHASING PREVENTOR (CURRENT SENSING)	LAURITZ KNUDSEN / SIEMENS / MINILEC
20	CTS	AUTOMATIC ELECTRIC / LAURITZ KNUDSEN / ABB / SIEMENS/ GE / MECO/ KAPPA
21	CONTACTORS	SIEMENS / LAURITZ KNUDSEN / SCHNEIDER / ABB / GE
22	UTP DATA CABLES	LEGRAND / MOLEX / FINOLEX / COMMSCOPE / PANDUIT-PANNET / HAVELLS
23	OF CABLES	LEGRAND / MOLEX / FINOLEX / COMMSCOPE / PANDUIT-PANNET / SEIMENS

SL.NO	NAME OF THE PRODUCT	MAKES
24	HOT DIP GALVANISED CABLE TRAY	PROFAB ENGINEER / MEM / RICOH / SLOTTO / STEELWAYS / BEC / FIXOTECH / OBO BETTERMAN / RMCON / PROFAB / INDIANA / MBM /LEGRAND
25	PANEL BOARD / FEEDER PILLAR / METER BOARD	CPRI APPROVED MANUFACTURER FOR RELEVANT BUS BAR RATING
26	FULLY TYPE TEST ELECTRICAL PANEL BOARD ASSEMBLIES AS PER IEC 61439	ABB/ SIEMENS/ SCHNEIDER/ LEGRAND/ LAURITZ KNUDSEN / GE
27	DWC PIPES	TELEREX / DUTRON / VEEKAY PLAST / DURA-LINE / SUPREME
28	TELEPHONE DP BOXES	KRONE / D-LINK / ITL
29	AIR CIRCUIT BREAKER	SCHNEIDER / SIEMENS / LEGRAND / ABB / LAURITZ KNUDSEN
30	PANEL BOARD MOUNTING SWITCHES / CONTACTOR / SINGLE PHASE PREVENTER / TIMER	SCHNEIDER / SIEMENS / LEGRAND / ABB / LAURITZ KNUDSEN
31	METERS / ELECTRICAL MEASURING INSTRUMENTS / MULTI FUNCTION METERS	AE / LAURITZ KNUDSEN / CONZERV / TRINITY / RISHAB / SECURE
32	INDICATION LAMPS / PUSH BUTTONS / SELECTOR SWITCH	LAURITZ KNUDSEN / SIEMENS /SCHNEIDER / AE / KAYCEE / IMP

SL.NO	NAME OF THE PRODUCT	MAKES
33	RISING MAIN / BUS TRUNKING	LEGRAND / LAURITZ KNUDSEN / SCHNEIDER / ABB / SIEMENS
34	SOLAR WATER HEATER	RACOLD/ EMMVEE/ KOTAK URJA/ JAIN/ SUDARSHAN/ V-GUARD
35	PUMPS AND PUMP SETS	KIRLOSKER/ CROMPTON/ TEXMO/ KSB/ GRUNDFOS / XYLEM
36	MOTORS	HAVELLS/ ARMSTRONG/ JOHNSON ELECTRIC/ GE/ SIEMENS/ ABB
37	LIGHTNING CONDUCTORS	OBO / DHEN / CAPS/ FUREE
38	ILLUMINATED SIGN BOARD	LEGRAND / MK / SYSTEM TEK / PROLITE / BAJAJ/HAVELLS
39	LT CABLES	FINOLEX / GLOSTER / HAVELLS / RR CABLE/ UNIVERSAL / POLYCAB / RPG CABLES / CCI
40	SOLAR LED LUMINARIES	PHILIPS / CROMPTON/ WIPRO / BAJAJ / HAVELLS
41	STREET LIGHT GI POLE	WIPRO / BAJAJ / HAVELLS / CROMPTON
42	STREET LIGHT LED FITTINGS	WIPRO / BAJAJ / HAVELLS / CROMPTON / UBITTER TECHNOLOGIES - PROLIMIN
43	HRC FUSES	LAURITZ KNUDSEN / SIEMENS / HPL / BCH / ABB / GE / HAVELLS

SL.NO	NAME OF THE PRODUCT	MAKES
44	UPVC/CPVC PIPE	ASTRAL / SUPREME / FINOLEX
45	HDPE PIPES	VARUN/ MANGALAM/ KODOOR / SUPREME
46	UPS	SCHNEIDER-APC /ABB / LEGRAND-NUMERIC / EMERSON -VERTIV / SIEMENS
47	BATTERIES	EXIDE/ AMARON / PANASONIC
48	INVERTER TYPE CASSETTE /SPLIT AC	HITACHI / PANASONIC / CARRIER/ DAIKIN/ O GENERAL / HAIER / VOLTAS / BLUE STAR / LLYOD
49	STABILIZER	V-GUARD / MICROTEK / APC
50	REFRIGERANT PIPES	GODREJ / MEHTA / MANDEV/ RAJCO / NIPPON/ TOTALINE / AS PER MANUFACTURER'S STANDARDS.
	NOTES: ALL MODULAR SWITCH, SOCKETS AND OTHER ACCESSORIES SHALL BE OF THE SAME MAKE. FOR ITEMS WHERE PREFERRED MAKES ARE NOT SPECIFIED, THE DECISION OF THE ENGINEER-IN-CHARGE SHALL BE FINAL AND BINDING.	

TABLE 2: LIST OF PREFERRED MAKES FOR PASSENGER MRL LIFT

SL.NO	NAME OF THE PRODUCT	MAKES
1	PASSENGER CUM STRETCHER LIFT	OTIS / KONE / JOHNSON / MITSUBISHI/ SCHINDLER

Executive Engineer (E) - Kochi
CPWD, Kochi