

TECHNICAL SPECIFICATION For AMC of LIFTS.**1.0 Scope of Work:**

1.1 Comprehensive Annual Maintenance and servicing Contract inclusive of all kinds of Routine Preventive & Corrective (Breakdown) Maintenance of 05 Nos. Lifts installed (Building no.4 (Magistrat office). building no. 5&6 (Electrical office), building no. 7 (Engineering office). building no. 8 (C&W office), Ganpati nagar ORH and Loco colony ORH Jaipur) will be inclusive of all materials, consumables, spares, Labour, T&Ps, testing instrument, Transportation of M&P, octroi, insurance etc. required. The scope of work includes replacement of SMF type batteries (of capacity compatible with lift as per ISS & IE rules) for ARD and emergency

Lights. This includes all type of Preventive & Corrective (Breakdown) Maintenance. (AMC will start after expiry of Warranty period.)

1.2 The scope of work also includes obtaining all Statutory Mandatory permissions/clearances/approvals from concerned authorities with regards to elevators Installations. This also includes preparation of elevators for Lift Inspector's inspection and to obtain Lift License / renewals of the Lift licenses during period of Contract.

1.3 The Comprehensive Maintenance Services rendered by the contractor shall include all kinds of Routine and Preventive Maintenance and Breakdown Maintenance. Breakdowns shall be attended on 24 hrs. X 365 days' basis. Routine & Preventive Maintenance shall be carried out during Non-Operational hours.

2.0 Schedule of Maintenance: -

(a) Preventive Maintenance: - Preventive Maintenance Schedule along with check lists and duration is to be submitted at the time of Contract agreement and same shall be part of Agreement Document. The preventive Maintenance is to be carried out in such a manner that overall functioning & reliability of the systems and functioning & reliability of equipment's are not affected.

(b) Corrective Maintenance/Breakdown Maintenance: - The Corrective / Breakdown Maintenance is to be carried out any time during 24 hrs. x 365 days inclusive of all Sundays and Holidays.

i) Minor Corrective Maintenance: - Inclusive of Repairing and Replacement of all Spares/Components and all other associated accessories which are covered otherwise and attention of all defects other than Major defects.

a) Response Time (Max.) --- 30 min.

b) Attending Time (Max.) --- 1 Hour.

ii) Major Corrective Maintenance: - It covers the attention of all type of Major Failures / Breakdown, which include Repair / Replacement of Assemblies, Sub-Assemblies and Components etc.

a) Response Time (Max.) 30 min.

b) Fault Attending Time (max.) 36 hours (Should be in proportion with the type of failure)
The decision of the Railway regarding the classification of Corrective Maintenance, as Minor/Major shall be final.

3.0 Maintenance Requirements**3.1 Maintenance during CAMC Period**

3.1.1 In addition to his obligations under the conditions of contract, the contractor shall provide maintenance services throughout the Comprehensive Annual Maintenance Period (CAMC) Maintenance work shall include attendance to all service calls, work described in approved maintenance schedule, and the followings:

3.1.1.1 The Contractor shall maintain adequate quantity of consumable and contingent spare parts in his custody at site in order to minimize the shutdown time due to repairs and maintenance. All parts rendered defective, including replacement of indicator lamps and programmable circuit board, shall be replaced. The list of these consumable and contingent spares should be submitted for Approval at the same time as the submission of the Preventive Maintenance Schedule (PM) & Corrective Maintenance (CM) procedure.

3.1.1.2 The Contractor shall dispatch competent personnel to rectify defects at any time during the day or night when being called on by the Railways within a time of half an hour (maximum). Repairs shall be carried out on a 24 hours per day, 7 days per week basis until the faulty unit is put back in service.

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3.1.1.3 The Contractor shall provide Fortnightly, Monthly, Quarterly, Half-yearly and Yearly reports on the condition of the equipment in an agreed format. Such reports shall include event logs and performance data collected from the associated indicative panel stored on diskettes/CDs or other agreed medium, over the reporting period. Such data shall enable off-line individual and fleet statistical analysis to be performed on a Personal Computer.

3.1.1.4 The Elevator System shall be maintained in such a manner that it achieves highest level of Reliability, Availability, and Maintainability & Safety. The Elevator System shall work in a fail safe manner keeping in view the nature of Premises & safety of persons/patients/visitors which is to be given highest priority. Safety of persons shall not be affected in any manner. All safeties shall be kept intact and functional at all time.

3.1.1.5 Availability, Reliability & Maintainability: - The firm shall maintain the lift in such a way so that the following parameters are achieved.

- a) Availability (Operating Hrs. – Unavailable Hrs.)/ Operating Hrs.= 99.50%
- b) Reliability (Total operating hrs./ No. of failure (Calls except external reasons) =1025
- c) Maintainability (Time under corrective maintenance/ No. of faults) =05

3.2 MAINTENANCE SERVICES

3.2 Routine and Preventive Maintenance: Preventive & corrective maintenance shall be carried out as per recommendation of OEMs, however Program of routine and preventive maintenance during the Annual Maintenance Contract and also during the tenure of annual maintenance contract shall comply with minimum requirements as below:

3.2.2 Fortnightly

This shall include the following but not limited to: -

- ☐ To check all bearing oils, oil rings, oil chains, etc. All machines should be carefully checked and repaired for abnormal temperature rise.
- ☐ To check and repair all relays and contacts as wells as their movements and repair as necessary.
- ☐ To clean traction machines, relays panels, control panel, starter panels, selectors, governors, car top, car gates, sills and pits.
- ☐ To check brake action and adjust if necessary.
- ☐ To check and repair movement of door switches, gate switches and emergency stop switches.
- ☐ To check and repair indicator lamps and indicator.
- ☐ To check and repair annunciator lights, buzzer and car lights.
- ☐ To check and adjust leveling differences, brake slippage, acceleration, deceleration and riding comfort.
- ☐ To check and repair movements of car control buttons, switches and the like.
- ☐ To check and repair operation of weighting devices.

3.2.2 Monthly (in additional to all Fortnightly Checks)

This shall include the following but not limited to:

- ☐ To turn grease cups for speed governors and compensating pulleys.
- ☐ To check and oil selectors.
- ☐ To top up rail lubricators.
- ☐ To clean ropes oil if necessary.
- ☐ To clean traction motor brushes, brush holders and internal frame. Adjust slip rings if necessary. Check commutators.
- ☐ To oil electric brake pins.
- ☐ To oil all pins of door operation and door opening mechanisms.
- ☐ To clean hoist way, beams slow down cams, outside cages, rails and counterweight rails.
- ☐ To clean, oil and adjust door closer and levers.
- ☐ To clean main sheave, secondary sheaves and rope sheaves on car top and counterweigh top.
- ☐ To clean and repair brake wheels and shoes.
- ☐ To oil compensating rope tensioning pulleys.

3.2.3 Every Two months (In additional to all Monthly Checks):

This shall include the following but not limited to:

- ☐ To clean and oil door hangers, door rails, interior of hanger case. If necessary adjust acentric rollers, car door hangers, door connecting ropes and chains.
- ☐ To check and repair door shoe.

- ☐ To clean and oil safety gears.
- ☐ To clean and oil car and counterweight guide shoes. Adjust if necessary.
- ☐ To clean and oil interior of terminal limit switches and position switches. Check rubber rollers of terminal limit switches. To check oil clean and repair interior of door switches, gate switches. Replace worn parts if necessary.
- ☐ To check and repair flexible cable.
- ☐ To check and repair movement of limit switches.
- ☐ To clean and oil interior of car control switches.
- ☐ To clean and check push buttons of car control panels.
- ☐ To check, clean and repair the sleeve and plungers of the electromagnetic brakes.

3.2.4 Quarterly (In additional to all two Monthly Checks)

This shall include the following but not limited to:

- ☐ To check and repair the operation of terminal limit switches and final limit switches.
- ☐ To check and repair the governor switches.
- ☐ To clean the brush holders and commutators of the door motors.
- ☐ To check and repair the traction ropes for broken wire, wear elongation and even tension. Adjust if necessary.
- ☐ To remove the dust inside the traction machines and controls panels using electric blower.
- ☐ To clean and repair the indicator lamps.
- ☐ To check the voltage of rectifiers and thyristors.

3.2.5 Half Yearly (In additional to all Quarterly Checks)

This shall include the following but not limited to:

- ☐ To check and repair the operation of safety gears.
- ☐ To check oil for oil buffers.
- ☐ To check and clean the hall buttons and contacts.
- ☐ To check and repair the compensating chains or ropes.
- ☐ To check and oil the bearing of door motors.
- ☐ To grease the secondary sheaves, car top sheaves and counterweights.
- ☐ To check the wear of guide shoes of cars and counter weights.

3.2.6 Annual (In additional to all Half yearly Checks):

This shall include the following but not limited to: -

- ☐ To clean the wire connection box of every landing and car cages. Tighten all screws and check the conditions of cables at conduit inlets and outlets.
- ☐ To check and repair the conditions of worm gear and thrust bearing of the gearboxes.
- ☐ To check and tighten screws of control panels, starters panels and relay panels.
- ☐ To remove the dust inside the landing indicator switches by electric blower.
- ☐ To test all safety devices.
- ☐ To dismantle, clean and adjust the electromagnetic brake of gearless machines.
- ☐ To change gear oil and motor oil.
- ☐ To check and tighten screws and foundation bolts of traction machine, secondary sheaves, exterior of lift frame, guide rail, guide rail clamps and bracket etc.
- ☐ To test the over current relays
- ☐ To provide all labour, materials, tools and transport to carry out annual inspection and load test according to the requirement of the employer.

All the scheduled maintenance services described above shall be properly programmed and agreed with the Engineer-in-charge in order not to affect operation of the lift systems.

In addition to above all maintenance shall also be carried out as per recommendation of OEM. Contractor shall submit Preventive & Corrective Maintenance Schedules with details of Checks duly indicating 'Must Change Items' for Railways Approval within 7 days from the Date of Issue of Letter of Acceptance. The Preventive Maintenance Schedule including Must Change Items shall be reviewed from time to time in order to achieve the highest order of Reliability, Availability, Maintainability & Safety (RAMS) & Changes found necessary, shall be incorporated in Preventive Maintenance Schedule.

3.3 BREAK DOWN MAINTENANCE:

The Contractor shall also undertake to provide a comprehensive breakdown service whereby qualified Technical Personnel shall attend to each breakdown as soon as practicable after a breakdown is reported and carry out immediate remedial work at a reasonable speed according to the nature of the breakdown.

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Any faulty equipment or components shall be quickly replaced. In circumstance such that the Contractor fails to attend the breakdown within One normal working hour after notification of the breakdown and where remedial work is interrupted during normal working hours for purposes other than obtaining replacement parts, the employer reserves the right to order such action as may be necessary to expedite completion of remedial work which shall be at the Contractors expense without abrogation of the Contractors responsibilities.

3.4 There will be a Minimum Guarantee of One Year for the Performance of Each Part/item, replaced during Preventive/Breakdown Maintenance from the Date of such Replacement. In case, the Replaced Item/Part fails during the Guarantee Period, in such case Guarantee shall be extended further for a Period of One Year from the Date of such replacement. Any Item /Part fails any time during the Guarantee Period, then the Replaced Item/Part shall have a Minimum Guarantee of One Year from the Date of such replacement.

3.5 Following specifications/Code of Practices are to be followed while carrying out Maintenance/ Inspection services:

SN	IS Code	Activity
1	IS:8216-1976	Inspection of lift wire ropes.
2	IS:14665-Part 2/Sec-1:2000	Code of practice for Installation, operation & maintenance of Passenger lifts.
3	IS:14665-Part 3/Sec-1:2000	Safety rules.
4	IS:14665-Part-5/1999	Inspection Manual

4.1 General

a) The Contractor shall keep 10% Spare parts of the total population of quantity (as detailed in SOR) for lifts of the under mentioned items and Consumables during the maintenance period to ensure that replacement work for defect can be carried out immediately. Moreover, if 10% (spare parts) works to be in fraction less than 01 no. then it is to be made available for at least 01 No.

- (i) Car control panel.
- (ii) Fire main switch.
- (iii) Emergency light, car fan and siren in lifts.
- (iv) SMF battery for ARD and emergency light.

b) A competent engineer shall be provided to investigate the fundamental cause of a fault & Remedial actions are taken accordingly. Temporary quick fix solution will not be accepted.

c) The employer shall at his discretion, take action to recover all losses incurred rising from the failure of the Contractor to perform the duties either wholly or in part as detailed in this section.

(d) Cleaning and mopping of elevators shall be carried out during periodic maintenance.

(e) Replacement of mats with Vinyl flooring shall be done at least once in a year.

(f) During maintenance floor mismatch shall be checked and certified by SSE in charge after scheduled/unscheduled maintenance.

4.1.1 The lifts are in good working conditions and the same should be handed over to the Railway in good working condition after completion of AMC work, failing which the deduction shall be made from the firm's bill after calculating amount of defects/ discrepancies.

4.1.2 A log book shall be maintained at site to record the maintenance schedule and break down etc. This register should be signed jointly by the firm and Rly. Representative after each attention (i.e. supervisor in charge) and the failure to do so will attract a penalty of Rs. 1000/- per occasion.

4.1.3 The firm shall deploy adequate skilled and trained staff and supervisor for 365day X 24hrs. The successful tenderer shall make arrangement for registration and shall depute one technical exclusively round the clock at Jaipur (for carrying out minor/ major/ any unusual break down. The response time shall be 30minutes from the lodging of complaint with the firm/firm's representative. They should be well qualified and conversant to keep the equipment properly. They will be responsible to maintain the equipment's in efficient, reliable and safe operation condition. The defective period will be treated from the lodging of complaint. The firm shall also display the Telephone No. and address near each lift.

4.1.4 The firm shall be liable to for any loss/ damage of material/ human life due to poor maintenance.

4.1.5 All the spares/ parts shall be replaced with original and genuine ones, the original invoice for the same shall be submitted along with bill.

4.1.6 The contract includes the change of the material as a result of normal wear and tear such as worms, gears, bearing, brake, magnet, coil, brake magnet, coil, brake, shoes, brushes, commutator,

rotating element, coils, resistance, LED door indications, hoist motor etc. and other mechanical part such as guides shoes cables, floor selector part, hoist way gates, sills, door, locks etc. and any other items and control panel of the lift. The parts to be replaced shall be done with original manufacturer's components. Invoice shall be submitted along with quarterly bill.

4.1.7 PLANNED MAINTENANCE:

The contractor will in accordance with their terms here of shall regularly examine, lubricate and adjust the equipment and generally carry out planned maintenance in a systematic and controlled manner using original manufacturer developed techniques/procedures. A site register shall be maintained for work done and shall be jointly signed by Railway representative and contractors authorized representative. (i.e. supervisor in charge).

EQUIPMENT SCOPE COVERED: (LIFT)

- 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 cables and hoist way and machine room elevator wiring.
- b) Furnish lubricant compound to stringent specification.
- c) Examine periodically all safety devices and governors and make all customary safety test, including working of fire man's switch.
- d) Systematically examine and adjust the following components.
 - 1) Mechanical parts i.e. Machine, worm, gear, thrust bearings, drive sheave bearing, break/make contact, lining and components etc. as installed.
 - 2) Electrical parts i.e. motor, motor windings, rotating element, commutator brushes. Brush holder, bearings, coils, resistance for operating and motor circuits, magnet frames and other mechanical parts etc. as installed.
 - 3) Safety equipment i.e. controller, selector leveling, devices, cam relays, solid state components, PCBs, transducers, resistor, condenser, power amplifiers, transformers, contacts, leads, dashpots, timing devices, steel selector tapes and mechanical and electrical driving equipment etc. as installed.

Note: - Governor, Governor Sheave, shelf assembly, bearings, contacts and governor jaws. Car and hall mechanical buttons, car and hall position indicators, car direction indicators and all other car and landing signal fixtures, as installed. Deflection or secondary sheave, bearings, car and counterweight guide rails and buffer top and bottom limit switches, governor tension sheave assembly, compensating sheave assembly, counterweight and counterweight guide shoes including rollers or gibs Interlocks on hoist way door, hoist way door hangers, guide, automatic power operated door operator, car door hanger, car door contact, safety shoe accessories load weighting equipment, car frame, car safety mechanism and platform. The contractor shall carry out the Testing of System including ARD & Overload Testing at Regular Period of time, but in no case exceeding one year. All checks and preventive maintenance shall be carried out as per recommendation of OEM and as mentioned in technical specification and contractor shall also submit the detail of Maintenance schedule, time schedule and check list of checks which shall be carried out at site.

4.1.8 The firm shall keep sufficient stock of original spare parts to be used during AMC at site to minimize the ineffectiveness / break down. The list of same to be submitted along with tender.

4.1.9 The minor complaint shall be attended/make good within 1 hr. after the lodging of complaint failing which the penalty shall be deducted from the bills as given in table below.(4.1.9). The major repair (door, rope & sheave, motor, gear, machine travelling cable etc.) shall be attended/made good within 36 hrs. after the lodging of complaint failing which the penalty shall be deducted from the bills. as given in table below.4.1.9)

Availability Slab	Applicable Penalty
95% to 90%	0.5% for every 1% (or part of) reduction in availability of Elevator
Below 90%	For every 1% (or part of) reduction in availability of Elevator Maximum up to quarterly AMC charges as per AMC contract per quarter

4.1.10 Availability Slab Applicable Penalty

The firm shall carry out maintenance schedule of all the equipment especially for the following: -

CHECK: - Monthly servicing and checking of one of the following each month All the checking and servicing shall be done as per relevant BIS.

MAIN MOTOR: Check the noise level, temperature of the motor, clean the motor, check the current taken by the motor in starting as well as running check for misalignment.

MAIN GEAR BOX: Check noise, temperature and oil, cleaning and check the misalignment.

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BRAKE: Check the adjustment of brake, check the distance of shoes check connection and clean thoroughly.

TRACTION SHEAVES: Check the sheaves size of groove check the wear and tear, check misalignment of pulleys and check the nuts and bolts.

DEFLECTION SHEAVES: Check the lubrication, lubricate with proper oil/ grease. Confirm whether the grease or oil is carrying proper lubrication. Check towards excessive wear and tear. Check towards noise level in the sheave. Check the bolting of lock, all the bolt tightening, if required.

MAIN ROPES: Check proper tensioning check wear and tear. Replace the same (If necessary) to maintain adequate factor of safety.

CAR SHOES: Check the uniformity with respect to guide rails, check the guide shoes gibs, check the movement of the cage.

CAR: - Check the push buttons.

SPEED GOVERNOR: - Check the operation check the ducting mechanism, lubricate properly.

GUIDE RAILS: - Lubricate with specified oil/ grease, check and guide clamps, check the bottom clearance, adjust if required.

LANDING DOORS: - Check the alignment, check the fixing of guide sheaves and lubricate.

LIMITS: - Check and adjust, check the operation.

Any delay in preventive schedule will again be treated as failure of the lift for which penalty clause as referred in Para 4.1.9 will be applicable.

EQUIPMENTS / SCOPE COVERED

Refinishing, repair or replacement of following of component will remain out of scope of this contract.

- a) Elevator car enclosure inside.
- b) Elevator car and landing door panel/ gates.
- c) Bulbs including indicator bulbs, FL tubes and alarm bell/ buzzer, cabin fan etc.
- d) Incoming electrical wiring up to main switches in the m/c room.
- e) Main switch in the m/c room.
- f) Invertors, battery, dry cell, ARD battery.
- g) Decorative item.

MACHINE, MOTOR AND CONTROLLER PARTS INCLUDING

Worms, gears, Thrusts, bearings, brake magnet coils, brake shoes, brushes, windings, commutators, rotating elements, contacts, coils, resistance, for operating and motor circuits, magnet frames and other mechanical parts- using only genuine parts for this purpose. The firm shall examine periodically all safety devices and governors. The firm shall furnish lubricants compounded to OEM's specification. The firm shall examine adjust and if conditions warrant, repair, or replace any step tread or comb plate.

4.1.11 PAYMENT: a) Payment shall be made to the contractor on quarterly basis on certification by the Rly. Representative for satisfactorily working of lifts and production of maintenance schedule Register. The statutory deduction i.e. Income tax, WCT, SD and performance guarantee shall be deducted as per extent rules.

4.1.12 The AMC will include renewal of lift licenses, renewal of fitness/ operational certificate for lift to be done by the firm and will provide necessary assistance for inspection, it means the firm has to arrange the renewed license from the office of Inspector of Lifts, Govt. of Rajasthan.

4.1.13 Safety check for the lifts and escalators will be carried out as per guidelines issued by Rajasthan Govt. in the presence of Rly. Representative and necessary certificate will be issued by firm. If the safety certificate expires and not renewed in time, the lift will be treated as defective. Hence, the clause as mentioned para 4.1.9 will be applicable.

4.1.10 CALL BACK SERVICE: The firm will provide call back service in all seven working days including holidays round the clock for which no call back service charges will be paid to the firm.

The No. of lift can be increased or decreased as per site conditions and accordingly the payment shall be made to firm.

The proportionate reduction/ deduction will be made in the firm's payment in case efficiency % of the lift is less than 95%- 90% and below 90% as per para 4.1.9.

NOTE: a) If any other minor item, which are not specified in the scope of work/schedule of rates and required to complete the job, shall be provided by the firm and No extra payment shall be made to firm.

b) Competent Authority reserves the right to accept/cancel/delete any item from SOR and or accept partial / full quantity of any item without giving any reason.

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- c) The contractor shall deploy adequate number of technicians to attend the lift/escalator regularly.
- d) During the work contractor will be responsible for any loss/ damage to material & human being.

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