

ATTACHMENT 2

PREVENTIVE MAINTENANCE GUIDELINES

Electric and Hydraulic Elevators

1. Preventive Maintenance Site-Visit Frequency:
 - 1.1 The contractor must perform a preventive maintenance site visit at the frequency stated on the Pricing Page.

2. On each visit, the contractor must:
 - 2.1 Contact responsible University personnel regarding covered unit complaints.
 - 2.2 Ride all cars, checking for any unusual noise or operation.
 - 2.3 Correct all malfunctions and/or complaints noted.

3. As directed by the University, the contractor must perform the following services:
 - 3.1 Controller
 - 3.1.1 Observe dispatching, timers, and relays for proper operation.
 - 3.1.2 Check all controller and supervisory relays and contacts. Replace where necessary.

 - 3.2 Hoist Machine
 - 3.2.1 Check sleeve bearing oil.
 - 3.2.2 Clean dirt and dust from exterior surface of machines.
 - 3.2.3 Check all sheaves and pulleys in host way including drive sheaves, and rope sheaves for wear and lubricate per manufactures recommendations and replace as necessary.

 - 3.3 MG Sets
 - 3.3.1 Renew or reseal brushes as required.
 - 3.3.2 Clean dirt and dust from exterior surface of MG sets.

 - 3.4 Signal and Dispatching
 - 3.4.1 Replace any burned out lamps in the starters control indicator panel, car operating panel, or car, etc.
 - 3.4.2 Observe dispatching, dispatching intervals, high and low call reversal circuits. Make corrections where necessary.
 - 3.4.3 Observe operation of car arrival lanterns and gongs. Correct any malfunctions noted.

 - 3.5 Car
 - 3.5.1 Check photo cells and safety edges for door retraction and obstruction timing. Replace when requested.
 - 3.5.2 Inspect car door operator. Clean, adjust, or replace pulleys, shafts, key ways, belts, cams, motor bushes. Lubricate where required.
 - 3.5.3 Clean door guide channels.

ATTACHMENT 2 (cont.)

- 3.6 Pit
 - 3.6.1 Clean pit and iron work located within the pit.
 - 3.6.2 Empty drip pan in pit.
 - 3.6.3 Check operation of sump pump and level switches for proper operation.

- 3.7 Hydraulic Machines - Pumping Units
 - 3.7.1 Wipe up any oil residue around machine.
 - 3.7.2 Maintain oil at proper level in tank.
 - 3.7.3 Check for excessive leakage around valves and pumps.
 - 3.7.4 Check oil heater operation and adjust or replace as needed.

- 3.8 Selector
 - 3.8.1 Adjust and/or replace selector brushes and contracts.

- 3.9 Hoistway
 - 3.9.1 Check hall button operation.

- 3.10 Jack Assembly
 - 3.10.1 Checking packing gland for excessive oil leakage. Tighten or repack, if necessary.
 - 3.10.2 Check plunger for signs of leakage or deterioration. Clean packing gland.

- 4. As directed by the University, the contractor must perform the following services:
 - 4.1 Selector
 - 4.1.1 Lubricate selector cable sheaves.

 - 4.2 Hoist Machine
 - 4.2.1 Observe worms and gears for end play, back lash, thrust, and any bearing wear in machine.
 - 4.2.2 Renew or reseal brushes as required.
 - 4.2.3 Clean and/or turn and undercut commutator.

 - 4.3 MG Sets
 - 4.3.1 Clean and/or turn and under cut commutators.

 - 4.4 Car
 - 4.4.1 Check alarm bell and communication system.
 - 4.4.2 Check leveling units.
 - 4.4.3 Check retiring cam device, chain, dash pots, pivots, fastenings, etc.
 - 4.4.4 Inspect and clean car door or gate and related parts.

ATTACHMENT 2 (cont.)

- 4.5 Hoistway
 - 4.5.1 Check leveling switches and leveling operation.
 - 4.5.2 Lubricate cup oil type sheave bearings.
 - 4.5.3 Check hoistway lighting. Replace bulbs where necessary.
- 4.6 Emergency Operation
 - 4.6.1 Test car emergency lights.
- 4.7 Ropes
 - 4.7.1 Check all ropes, grooves, and hitches and equalize tension.
 - 4.7.2 Lubricate where necessary.
 - 4.7.3 Check rope, clamps, sheaves and shackles.
 - 4.7.4 Check compensating chain or rope and hitches.
 - 4.7.5 Advise University if ropes or sheaves should be shortened or replaced. Replace as necessary.
- 4.8 Hydraulic Machines - Pumping Units
 - 4.8.1 Check tension and wear of "V" belts.
 - 4.8.2 Inspect flexible hoses and connections.
- 4.9 Jack Assembly
 - 4.9.1 Check platen bolts for cracks and tightness.
- 5. As directed by the University, the contractor must perform the following services:
 - 5.1 Controller
 - 5.1.1 Check settings and operations of overloads.
 - 5.1.2 Check controller voltages.
 - 5.1.3 Check resistor tubes, grids, condensers, etc.
 - 5.2 Selector
 - 5.2.1 Clean and lubricate selector chains, guides, drives, and drums.
 - 5.3 Hoist Machine
 - 5.3.1 Check motor connections.
 - 5.4 Car
 - 5.4.1 Replace non-rechargeable emergency light batteries.
 - 5.4.2 Check load weighing device.
 - 5.4.3 Clean car tops and related hardware.
 - 5.4.4 Check and adjust car door upthrusts.
 - 5.4.5 Inspect guide shoes and roller guides. Lubricate if required.
 - 5.4.6 Inspect broken tape or cable switches.
 - 5.4.7 Check and test all safety devices.
 - 5.4.8 Check clearance for car safety shoes.
 - 5.4.9 Check stile channels for bends and cracks. Also, check car frame and support.
 - 5.4.10 Check car operating panel, controls, and switches. Clean and lubricate when necessary.

ATTACHMENT 2 (cont.)

- 5.5 Hoistway
 - 5.5.1 Inspect reed switches.
 - 5.5.2 Inspect limit switches, contacts, cam alignment.
 - 5.5.3 Check sheave fastenings, grooves, lubricate grease type bearings.
 - 5.5.4 Check stiles for cracks, bends, loose nuts, etc.
 - 5.5.5 Inspect hoistway door guides and door closers.
 - 5.5.6 Clean door hangers, tracks, and rollers. Adjust upthrust where necessary.
- 5.6 Pit
 - 5.6.1 Clean and lubricate governor tail sheave.
 - 5.6.2 Check oil levels in buffers.
 - 5.6.3 Clean and lubricate compensating sheave, selector tail sheave.
- 5.7 Emergency Operation
 - 5.7.1 Activate fireman's recall system.
 - 5.7.2 Test each covered unit's emergency service.
 - 5.7.3 Activate emergency hospital service system.
 - 5.7.4 Test emergency power system.
- 5.8 Governors
 - 5.8.1 Clean, lubricate, and test for free movement of all governors. Manually extend governor weights to make sure there is no restriction in motion.
- 5.9 Hydraulic Machines - Pumping Units
 - 5.9.1 Lubricate motor bearings.
- 6. As directed by the University, the contractor must perform the following services. The contractor must perform the initial annual services within 30 days of the beginning of the contract period:
 - 6.1 Controller
 - 6.1.1 Clean and check fuses and fuses holders, replace when required.
 - 6.1.2 Inspect dampening motor.
 - 6.2 Hoist Machine
 - 6.2.1 Inspect brake, brake drum, and drive sheave. Remove, clean, and lubricate DC brake cores. Clean or replace brake shoes if necessary. Check pivot pins for free movement.
 - 6.2.2 Change sleeve bearing oil.
 - 6.2.3 Blow out machine with air pressure.
 - 6.2.4 Check armature or rotor clearance.
 - 6.3 MG Sets
 - 6.3.1 Blow out machine with air pressure.
 - 6.3.2 Check armature or rotor clearance.
 - 6.3.3 Grease roller bearing.
 - 6.3.4 Change oil in sleeve bearing.
 - 6.3.5 Check MG set connections.

ATTACHMENT 2 (cont.)

- 6.4 Car
 - 6.4.1 Check car enclosure steadying device.

- 6.5 Hoistway
 - 6.5.1 Check wear and insulation on traveling cables. Check junction box connection.
 - 6.5.2 Clean hoistway, separator beams, guide rails, door guide channels, etc.