

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Related sections
 - .1 Section 14 00 00 – Additional General Conditions
 - .2 Section 14 20 06 – Elevators 1, 2, 3, 4, 5, 2s

1.2 DESCRIPTION

- .1 The Contractor agrees to provide skilled labor, adequate equipment supervision, tools, instruments, materials and parts required for a complete elevator maintenance service according to the specifications and the terms and conditions set out in this document.
- .2 The full maintenance service includes periodic preventive inspections, callback and repair service in case of breakdowns including parts and labor for repairs or preventive replacements.
- .3 All work causing a shutdown of a complete elevator group shall be performed outside regular hours with the approval of Departmental Representative and without additional fees.
- .4 The requirements of the specifications herein and the specifications from the manufacturer shall be considered only as a minimum to be achieved and shall not limit the responsibility and warranty of the *Contractor*.
- .5 Execute all the works in conformity with the rules of the art and to the safety requirements generally recognized for this type of installation.
- .6 In every case where the singular is used in the specifications, it is implied that the plural applies when necessities to complete adequately the installation.

1.3 DEFINITIONS

- .1 The term *Verify / Examine* implies to clean, lubricate, calibrate, adjust, repair or replace parts as needed.
- .2 The term *Clean* implies to remove any dust, carbon dust, rust, oil, grease, etc located on any equipment, part of equipment or working zone.
- .3 The term 'regular hours' means the time frame from Monday to Friday between 8 am and 17 pm except industry holidays.

1.4 CODES AND REGULATIONS

- .1 Execute all required work in accordance with the latest editions of the ASTM A17.1-2010/CSA B44-2010 Code (update included), CAN/CSA-B651-12 Code and any other federal, provincial and municipal regulations applicable for this type of installation, including the National building Code of Canada and the Quebec Electrical Code.
 - .2 Execute all work in compliance with the labor standards applicable for this type of installation.
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- .3 Inform Departmental Representative of any changes to these requirements occurring during the term of the contract and work to be done to meet them included or not in this contract.

1.5 SPECIFICATIONS INTENTIONS

- .1 The purpose of the specifications is to describe the procedures and requirements of maintenance to ensure proper operation of elevators. The Contractor agrees to comply with the specifications.
- .2 Preventive maintenance described in the specifications must be executed to ensure equipment higher life expectancy, in addition to minimize the unplanned operating stops.

1.6 WORK NOT INCLUDED

- .1 For all work not included herein, the Contractor shall obtain the written approval of Departmental Representative before performing the work.
- .2 Work not included under this contract are defined as follows:
 - .1 Work to be performed outside the hours prescribed and approved in writing by Departmental Representative.
 - .2 Work made necessary due to vandalism and approved in writing by Departmental Representative.
- .3 Departmental Representative reserves the right in the case of emergency repairs, to do the emergency repair work in overtime.
 - .1 Emergency repair:
 - .1 The Contractor shall, in all cases of emergency repair, notify the Departmental Representative and evaluate opportunities with him to complete the repairs in overtime. The evaluation of the work period required in overtime time will be indicated to Departmental Representative.
 - .2 The Contractor shall complete the repairs in overtime after obtaining written approval of Departmental Representative.
 - .3 Emergency repairs carried out in extra time at the request of Departmental Representative, shall be paid as follows: The Contractor will absorb the number of hours worked at the regular rate and Departmental Representative will only pay an additional amount for premium hours.

1.7 SITE VISIT

- .1 The *Contractor* acknowledges having examined the site before submitting its bid and, therefore, may not claim any errors or omissions on the nature and extent of its commitments and obligations

1.8 OWNERSHIP OF EQUIPMENT

- .1 The *Contractor* shall be responsible for any good belonging to Departmental Representative, when these possessions are under the care or control of the *Contractor*. The *Contractor* shall be responsible for any loss or damage resulting from his negligence or that of his employees.
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- .2 All existing equipment, including any replacement parts installed under the contract or any other components that extra payment was made for, are the exclusive property of Departmental Representative.

1.9 CONTRACTOR'S PERSONNEL

- .1 The Contractor shall provide skilled workers with valid elevator mechanic skills cards and confined space skills cards and a minimum of five years experience, able to work with promptness and efficiency in a manner that conforms to rules Art and the Departmental Representative satisfactory.
- .2 Departmental Representative may require from the Contractor to replace any employee he considers incompetent, negligent or otherwise undesirable. A verbal notice is sufficient for the exercise of this right.
- .3 Unless otherwise noted, if the staff of the Departmental Representative staff or the building occupant goes on strike, the *Contractor's* employees must continue the work. If the *Contractor's* employees were unable to perform the work, the owner, in its sole discretion, will decide what measures to take.
- .4 The contractor has the responsibility to train its employees, at its expenses, even when training is necessary to meet the specific needs of this contract.
- .5 The *Contractor's* employees assigned to this contract shall wear a uniform with the company's name on it.
- .6 The *Contractor's* employees assigned to this contract shall be able to speak French and English.

1.10 RESPECT OF THE EMPLOYMENT LAWS

- .1 The *Contractor*, as an employer must pay any all subscription according to the Canada Pension Plan, the Industrial Accidents Act, laws concerning taxation, the Unemployment Insurance Act and other mandatory contributions under federal, provincial or municipal law.
- .2 Departmental Representative has the right to terminate this contract at any time if the contractor or its subcontractors are not complying with the work health and safety commission.
- .3 Departmental Representative may deduct any amount due to the contractor until it or its subcontractors pay fully all contributions above.

1.11 SAFETY MEASURES

- .1 This article states the minimum standard and does not limit in any ways the responsibilities and obligations of the Contractor. In case of conflict between the security measures set out below and the established practices of the Departmental Representative, the established practices of the Departmental Representative have precedence. The Departmental Representative may at its sole discretion, impose additional standards of safety.
- .2 The particular instructions and the orders given by Departmental Representative on the workplace also have precedence on any safety measures expressed in the present.
- .1 Smoking is prohibited in the building.

- .2 The Contractor shall not use the materials, tools and equipment belonging to the Departmental Representative without the consent of the latter.
- .3 Departmental Representative may, at its discretion and according to his instructions, suspend or terminate the work of the Contractor for reasons of security without liability to Departmental Representative or any compensation for the Contractor. The instructions and stop work shall be recorded by the Contractor and the Departmental Representative, they will agree on the date and method of resumption.
- .4 The Contractor shall provide and install quality warning signs and temporary partitions (barricades) with a minimum height of 42 inches for the protection of public areas for work when hindering public traffic areas.
- .5 The Contractor shall ensure that its employees are aware of the building fire fighting equipment and safety measures.
- .6 The Contractor shall ensure that its employees have at their disposal the equipment and safety clothing required for the execution of their functions.
- .7 The Contractor has the responsibility to inform the Departmental Representative of any hazardous or unsafe conditions, and in the shortest possible time.
- .3 The Contractor is, at all times, responsible for ensuring the safety of its employees and any person and all movable and immovable property near the work and shall at all times comply with all standards, code and law on health and safety.
- .4 The Contractor must follow the procedures outlined in the building orientation guide.

1.12 SECURITY MESURES - HOT WORK

- .1 The Contractor must follow the procedures outlined in the building orientation guide.

1.13 SECURITY MESURES – CONFINED SPACE

- .1 The contractor must carry out his work in accordance with the instructions established in section 01 35 29.06 Health and safety.
- .2 The contractor is responsible for developing the safe work procedures required according to article 1.32 of section 01 35 29.06 Health and safety. The contractor must write up the procedures and have them approved by the Ministerial Representative, before the start of maintenance work.
- .3 The contractor shall transmit the risk assessment forms to Departmental Representative at least 5 days before the date set for entry into these confined spaces. He should include all costs for the measures to be taken, monitored and strictly enforced in order to meet safety requirements for confined spaces.

1.14 RESPONSIBILITY

- .1 The Contractor assumes all the risks and responsibilities which relates to the execution of the present contract including its appendices and has to take all the necessary measures to avoid any damages to Departmental Representative or third party goods. For that purpose, the Contractor makes a commitment to guarantee and to indemnify Departmental Representative against any damages, losses, complaints or expenses resulting from the present contract, including the expenses and judicial and extrajudicial fees engaged by Departmental Representative and to take sides for him.
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1.15 CESSION

- .1 The present contract is non-transferable by the Contractor and cannot be given in subcontracting, in all or in part, without the preliminary written assent of the other sides. The fact for the Contractor to give up the present contract or to give it in subcontracting does not relieve him of its obligations at the end of the present contract.
- .2 The Contractor declares that he did not sell or given up the universality, a part or a particular category of his current or future debts and he makes a commitment to inform Departmental Representative of any sale or possible transfer of his debts within ten (10) days of the aforementioned sale or transfer.
- .3 If the Contractor does not inform Departmental Representative according to the disposition which precede and in which Departmental Representative becomes responsible for the payment to the transferee of sums of money already paid to the Contractor, the Contractor and the signatory of the present contract shall be jointly responsible for the repayment to Departmental Representative of any sum paid to the Contractor.

1.16 QUALITY INSURANCE

- .1 Departmental Representative reserves the right at the end of the present contract to verify or mandate someone to verify the work made during the course of the contract.
 - .2 In every case, the Contractor recognizes that at the end of the present contract he is responsible for the quality of the works made during the course of the contract.
 - .3 The Contractor shall maintain and supply on reasonable request the appropriate documentation which demonstrates the respect for the present contract.
 - .4 Departmental Representative can, at any time during the term of this contract, inspect or make inspect the works by his consultants, verify the operations of the Contractor and have access to areas and necessary documentation for the verification of any subject relative to this contract. The Contractor has to foresee the availability of his staff assigned to the contract.
 - .5 If Departmental Representative deposits a note in regards to the quality of the works or the executed services, the Contractor has to, within a few hours, supply to Departmental Representative a written report describing the badly executed works and the measures taken to avoid a recurrence.
 - .6 The Contractor agrees that the requirements of quality insurance of this contract also apply to his subcontractors.
 - .7 The Contractor has to demonstrate, on request, and to the satisfaction of Departmental Representative the following:
 - .1 The existence and the respect of a work quality control program.
 - .2 The applicable manufacturing standards at the equipment installation time;
 - .3 The Contractor shall perform periodic verifications of the services supplied to Departmental Representative, according to the calendar foreseen by the quality control program aiming at verifying the efficiency of the works. The frequency of the verifications can be straightened according to the results of the previous verifications or be negotiated between sides at needs.
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- .8 The Contractor shall assist to monthly meetings with Departmental Representative to evaluate the maintenance quality as well as to verify with him the breakdowns listing and maintenance registers.

1.17 REPLACEMENT PARTS

- .1 Except approved modification, the replacement parts used on the vertical transport system within the course of this contract shall be authentic parts of current production.
- .2 If the *Contractor* judges that he would have a better replacement part, he shall submit it to Departmental Representative for approval. This new piece will be the responsibility (parts and labor) of the Contractor.

1.18 PROCEDURES

- .1 The *Contractor* shall submit to Departmental Representative a list of the mechanics and their supervisor that are qualified to perform the maintenance preventive on the equipments. This list shall include their experience, as well as any other relevant information in regard to their work.
- .2 The maintenance preventive shall be performed during regular hours. At his arrival on site, the mechanic shall register with the person in charge of the building.
- .3 Any work causing a shutdown of a complete elevator group shall be performed outside regular hours with the approval of Departmental Representative and without additional fees.
- .4 At any given time, Departmental Representative shall be informed, at least 5 days in advance, of any major works which would require the shutdown of a unit.
- .5 At any given time, Departmental Representative shall be informed, at least 24 hours in advance, of any deliveries which must be made at loading dock.
- .6 No work generating noise of more than 70 dBa or generating strong smells will be tolerated during regular hours. Those works shall be done outside regular hours without any fees to Departmental Representative. Only Departmental Representative shall be the judge of the tolerated works.
- .7 No demand for overtime work will be accepted without prior written authorization of Departmental Representative.

1.19 CLEANLINESS AND DAMAGES

- .1 At any given time, the machine room, hoistway, car top or any other areas directly related to the operation of the elevator shall be clean and free of any obstacle.
- .2 Oil leaks and the abnormal accumulations of dust shall be quickly cleaned and their causes determined for immediate necessary corrections.
- .3 When work must be executed on landing floors, the mechanic shall make sure to protect the floor or any other surfaces not to soil the area. The mechanic shall make sure to leave the area in the same state of cleanliness at the time of his arrival.
- .4 Departmental Representative reserves the right to demand to the *Contractor* the costs required to correct the damages or the stains caused by the *Contractor*.
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1.20 MAINTENANCE LOGBOOK

- .1 Keep in the machine room a clean and up to date maintenance logbook. This register shall include, for each of the visits, the date and arrival time, the purpose and brief description of work done, the detail of the testing and checking. Always keep the activities of the last five years in the register.
- .2 Include in the maintenance logbook a schedule of the routine works required within the course of the preventive maintenance.
- .3 Submit to Departmental Representative a detailed monthly report on the service calls and other work on the equipments. Participate in a meeting, as needed, with Departmental Representative to discuss the report and the activities which relates to the maintenance. The monthly report shall include at least the following information:
 - Date;
 - Building / Location;
 - Elevator Number;
 - Time of the call;
 - Time of arrival;
 - Time spent on the call;
 - Description of the problem by the client;
 - Problem Description and Action taken to resolve it by the mechanic;
 - Name of the mechanic.

1.21 ANNUAL TESTS

- .1 Perform all the tests prescribed in Section 8.11.2 and 8.11.3 of ASTM A17.1-2010/CSA B44-2010 code. The annual tests shall be conducted 30 days before the contract expires.
- .2 Provide Departmental Representative a copy of the certificates of annuals tests.

Part 2 PREVENTIVE & CORRECTIVE MAINTENANCE**2.1 MAINTENANCE SERVICES**

- .1 Contractor Responsibility
 - .1 Responsibility of the Contractor, without limitation, applies to the following components:
 - .1 Controller including all the relays, semiconductors, resistances, condensers, transformers, contacts, conductors, control potentiometers, computer components and traveling cable.
 - .2 Selector and dispatch equipment including selector steel tape and the mechanical and electric driving equipment.
 - .3 Hoistway equipments including platform and counterweights, buffers, guide rails, superior and inferior terminal stopping devices.
 - .4 Hall and car fixtures including pushbutton, key-operated switches and direction & position lantern indicator.
 - .5 Hall door equipments including interlocks, door suspension, door guides and door closing devices as well as all the safety open door devices.
 - .6 Car door equipments including door operator, door suspension, door guides, keys, motors, coupling arms, cams and contacts.
 - .7 Platform equipments including the frame, weight detector, safeties, shoe or roller guides.

- .8 Not Used
- .9 Not Used
- .10 Not Used
- .11 Not Used
- .12 Pumps and hydraulic motor, hydraulic cylinder and plunger if out of ground installation, hydraulic liquids, valves unit, filters, mufflers, cathodic protection system, vitaulic joint and gasketsm, oil cooler and oil heater.
- .13 Motor and motor generator including motor winding, rotating parts, commutator, brushes, brush holders and bearings.
- .14 Auxiliary brake system.
- .15 Cab fan and emergency lighting system.
- .16 Communication system between cab, machine room and security desk.
- .17 Not Used
- .18 Not Used
- .2 The *Contractor* is not responsible for following components:
 - .1 Hoistway enclosure including doors and hall barriers, door frame and hall door sill;
 - .2 Any damages due to vandalism acknowledged by Departmental Representative.
- .2 Vandalism
 - .1 Work related to damage caused by acts of vandalism must be recognized by Departmental Representative.
 - .2 Charge in addition to the contract, only the vandalized parts and limited profit margin and administration 15% of the cost of parts.
 - .3 Working time for this work is included in the contract.

2.2 CALLBACK AND REPAIR SERVICE

- .1 The Contractor shall maintain and provide a callback and repair services in case of breakdown as prescribes in this section.
- .2 Callback services
 - .1 Provide a telephone service line monitoring for incoming calls at all times.
 - .2 Include callback services during regular working hours.
 - .3 The technicians responsible of the building shall permanently be equipped with a telecommunication device so that the *Contractor* can contact and assign him to the service call.
 - .4 Any emergency work started at regular time shall be completely completed free of charge if Departmental Representative requires it.
 - .5 The *Contractor* shall maintain a record of all calls, including the date, time, nature of call, work performed and additional work required.
 - .6 Major repair that would normally take more than 8 hours/team (eg. A motor rewinding, replacement of hoistropes) may be made during regular business hours.
- .3 Emergency callback services
 - .1 Include all fees for emergency callback services in the cases described below.
 - .2 Provide 24 hours emergency callback services in case of, but not limited to, a person trapped in an elevator, simplex elevator is out of service or more than one car in a group is out of service.

.4 Response Time

- .1 Ensure a maximum response time, for the arrival of a technician on site, after a service call of Departmental Representative, as described in the table below:

Type of call	Maximum response time
<u>Callback services:</u>	
During regular hours	45 minutes
Outside regular hours	90 minutes
<u>Emergency callback services:</u>	
During regular hours - Emergency	30 minutes
Outside regular hours - Emergency	45 minutes

2.3 TOOLS AND MATERIAL**.1 Parts on site**

- .1 Maintain, inside a metal cabinet located in the machine room, an inventory of minor replacement parts such as:
- .1 Light bulbs for the car and hall pushbuttons;
 - .2 A complete car and hall pushbuttons unit;
 - .3 Fuses and relays of each type used in the controller;
 - .4 Commutator brushes for DC motor;
 - .5 Roller guides for hall and car door;
 - .6 Four (4) liters of geared machine oil;
 - .7 Five (5) gallon of hydraulic oil;
 - .8 One (1) gallon of multi-purpose lubricant;
 - .9 Products and cleaning cloths;
 - .10 100 watts light bulbs for the replacement of the top of car and pit lighting.
 - .11 Not Used

.2 Parts locally

- .1 Maintain locally an inventory of major replacement parts available within 48 hours such as:
- .1 A complete set of car roller or shoe guide;
 - .2 A complete set of hall and car door suspension;
 - .3 A complete door operator unit;
 - .4 Microprocessor boards or PLC;
 - .5 Ventilators;
 - .6 Transformers;
 - .7 Brake pads;
 - .8 Door detector unit;
 - .9 Relays and controller parts;
 - .10 Valves.

.3 Available Tools

- .1 Maintain locally a set of tools and of instruments such as multimeter, tachometer, chain block, oscilloscope, testing weights, pressure manometers, welding equipments and cleaning kit.

- .2 Maintain locally any electronic tools necessary for the programming of the controllers.

2.4 PREVENTIVE MAINTENANCE

.1 Object

- .1 The preventive maintenance program consists of a series of activities based on a mixed program of frequency of use and period. If the use of the vertical transport systems is higher than at the time of the contract signature; the periodic maintenance interventions shall be increased.

.2 Maintenance activities

- .1 The Contractor shall rapidly correct all excessive wear, breakdown or lack of adjustment of any elevator components detected during a maintenance activity.

.3 Inspection frequency

- .1 The Contractor shall perform preventive maintenance activities identified in the specifications while respecting the frequency and schedule shown in table below (the number of minutes allocated in the table for the activities is considered a minimum per unit and does not include repairs and service calls).

Period	Maintenance Activity		Hydraulic Elevators
Free	Monthly		0.75 hr per period
Free	Quarterly		0.75 hr per period
Free	Biannual		1.25 hr per period
September	Annual		3 hr per period
TOTAL (per unit):			17.5 hr

- .2 Maintenance activities shall always be coordinated with Departmental Representative.

.4 Monthly activities

- .1 Perform the following tasks on each elevator once a month:
- .2 Ride each car on its entire travel in both up and down directions and check and correct the following:
- .1 Ride comfort and vibrations;
 - .2 Unusual noise;
 - .3 Door operation and pre-opening;
 - .4 Pushbutton and indicators operation;
 - .5 Car safety features, including alarm button, and stop switch;
 - .6 Door protective devices operation;
 - .7 Fan and door noise levels.
 - .8 Leveling of the car (acceptable maximum: 6 mm).
- .3 Hall and car doors; Check and correct the following:
- .1 The positive locks, the mechanical locks and the door contacts;

- .2 Door reopening device;
 - .3 Hoistway access switch;
 - .4 The eccentrics and door retaining devices;
 - .5 The lower door guides;
 - .6 The roller guides;
 - .7 Clutch, cams and assembly;
 - .8 The suspensions;
 - .9 The door panels attachments;
 - .10 The door closer;
 - .11 Guard parts.
 - .4 In the hoistway; Check and correct the following:
 - .1 Unusual noise;
 - .2 Cleanliness;
 - .3 Abnormal vibrations;
 - .4 Clean the pit floor;
 - .5 Pit light;
 - .6 Clean and lubricate the pit equipments (pulley, buffers and others).
 - .5 In the cab and car top; Check and correct the following:
 - .1 Clean door mechanisms;
 - .2 Check the door operator;
 - .3 Check the emergency lighting system;
 - .4 Check the door closing force (maximum acceptable: 30 lbs);
 - .5 Check and replace as necessary the light on the inspection unit;
 - .6 Check car and counterweights guides.
 - .7 Make sure the fan is running 24/24 hours and cleaned monthly.
 - .6 In the machine room; Check and correct the following:
 - .1 Unusual noise;
 - .2 Cleanliness;
 - .3 Abnormal vibrations;
 - .4 Oil leak.
 - .7 Not Used
 - .8 In the machine room / Power unit; Check and correct the following:
 - .1 Oil leakage on the power unit;
 - .2 Oil levels in the tank with car at lowest and highest travel point;
 - .3 Oil temperature & color to detect impurity;
 - .4 Condition and tension of drive belts;
 - .5 Power unit operation;
 - .6 Bearings and operation, pump bearing noise;
 - .7 Valves;
 - .8 Wiring connection.
 - .9 In the machine room / Controller; Check and correct the following:
 - .1 Over heated or failed parts in the controller;
 - .2 Wiring connection and insulation;
 - .3 Relay, drive and other components.
 - .10 Not Used
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- .5 Quarterly activities
 - .1 Perform the following tasks on each elevator every three months:
 - .2 In the hoistway; Check and correct the following:
 - .1 Compensation pulley switch;
 - .2 Compensation pulley bearing;
 - .3 Clean the compensation ropes;
 - .4 Check the buffers.
 - .3 Hall and car doors and car top; Check and correct the following:
 - .1 Clean and lubricate, if required, the hoistropes and speed governor ropes;
 - .2 Check the hoistropes tension (maximum acceptable variation: 10 %).
 - .3 Check, clean and lubricate if required, the door tracks, suspension, guides and eccentric of the car doors;
 - .4 Verify and repair if required, the door eccentrics and door retaining devices as well as the clutch, and mobile cams of the hall doors;
 - .5 Check and clean the hall doors;
 - .6 Check, clean and lubricate if required the doors operation mechanisms;
 - .7 Check the car and counterweight roller guides tension.
 - .6 Biannual activities
 - .1 Perform the following tasks on each elevator every six months:
 - .1 Check, clean and lubricate if required, the door tracks, suspension, guides, locks, closing device and eccentric of the hall doors;
 - .2 Clean the machine room floor;
 - .3 Clean the dust the controller and change the dust filters;
 - .4 Clean the carbon dust on the machine room equipment;
 - .5 Clean the car top;
 - .6 Check and test the superior and inferior terminal stopping devices including the slowdown switches;
 - .7 Check and repair the hoistropes fasteners, check the hoistropes and speed governor rope diameter and presence of rust to ensure safety.
 - .8 Check, clean and lubricate the car and counterweight safety devices.
 - .9 Check packing of the cylinder head to detect leaks;
 - .10 Test the communication system and submit a report to Departmental Representative.
 - .7 Annual activities
 - .1 Perform the following tasks on each elevator every year:
 - .1 Perform all the performance level testing as describe in the specifications;
 - .2 Perform all the testing prescribe at Section 8 of the ASTM A17.1-2010/CSA B44-2010 code;
 - .3 Check the connection in the controller;
 - .4 Check the overload relay in the controller;
 - .5 Check travelling cables condition;
 - .6 Disassemble and clean all the components of the machine brake and performed the testing prescribe at Section 8 of the ASTM A17.1-2010/CSA B44-2010 code.
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- .7 Check and clean all the components of the auxiliary brake (rope brake) and performed the testing prescribe at Section 8 of the ASTM A17.1-2010/CSA B44-2010 code.
- .8 Check the relief valve setting as required by article 8.11.3.2.1 of ASTM A17.1-2010/CSA B44-2010 code.
- .9 Check the cylinders as required by article 8.11.3.2.2 of ASTM A17.1-2010/CSA B44-2010 code.
- .10 Provide assistance to Departmental Representative for testing of the emergency power system and repair if necessary.
- .11 Perform real time testing of Emergency Operation (Emergency Recall Operation - Phase I & Emergency In-car Operation - Phase II) and emergency power operation with Departmental Representative.
- .12 Include all fees for assistance to Departmental Representative for testing of the emergency power system and fire alarm system including verification of smoke detector in the hoistway.

2.5 MANEUVERS

- .1 The Contractor shall maintain operation and performance levels as described in the related sections.

2.6 CRITERIAS AND METHODOLOGY

.1 Hoistropes

- .1 A yearly detailed report shall be submitted to Departmental Representative on the condition of the hoistropes.
- .2 Replace the entire set of ropes if one of the following conditions appears:
 - .1 The rope diameter is lower than what is allowed for the corresponding nominal diameter as per the following table:

Nominal	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"
Minimum	11/32"	13/32"	15/32"	17/32"	37/64"	41/64"	45/64"

- .2 In absence of corrosion, if the number of broken wires per rope lay exceed the following values:

Rope construction	Uniformly distributed broken wires	Broken wires predominate in one or two strands
6 x 19 6 x 21 6 x 25	24	8
8 x 19 8 x 21 8 x 25	32	10

- .3 In presence of corrosion, if the number of broken wires per rope lay exceed 50% of the value shown in article 2.6.1.2.2 or if a 50% reduction of the diameter gap of the article 2.6.1.2.1.
- .3 The length of a rope lay is determined as follow:

Nominal	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"
Length	2-1/2"	2-7/8"	3-1/4"	3-5/8"	4-1/16"	4-1/2"	4-7/8"

.2 Governor ropes

- .1 A yearly detailed report shall be submitted to Departmental Representative on the condition of the governor ropes.

- .2 Replace the ropes if one of the following conditions appears:
 - .1 The rope diameter is lower than what is allowed in article 2.6.1.2.1.
 - .2 In absence of corrosion, if the number of broken wires per rope lay exceed 75% of the maximum allowed in article 2.6.1.2.2.
 - .3 In presence of corrosion, if the number of broken wires per rope lay exceed the maximum allowed in article 2.6.1.2.3.
 - .3 Rotating elements balancing
 - .1 Foresee that the machine and the motor are perfectly balanced and aligned in order to limit to 1/1000" the vibrations at the end of the motor.
 - .2 Limit the horizontal play and the gear play to a maximum of 5/1000" at balance load.
 - .4 Commutator segments depth
 - .1 Maintain a depth of 1/32" to 3/64" for the commutator segments.
 - .5 Commutator brushes
 - .1 Replace the entire set of commutator brushes if worn out more than 60% of the original length.
 - .2 Adjust the commutator brush holder in order to maintain a pressure force of four (4) pound per square inch.
 - .6 Methodology
 - .1 **Car speed (seconds):** Measured in feet/minute and at constant speed. A variation of 5% is acceptable.
 - .2 **Operating times (seconds):** Measured from the time doors closing cycle begins until doors are three quarters opened at next floor, assuming a maximum floor height of 13 feet. A variation of 5% is acceptable.
 - .3 **Door opening / closing times (seconds):** Measured from the time doors start to open / close until the doors are fully opened / close.
 - .4 **Doors dwell times (seconds):** Measured from the time doors are fully opened until the door closing cycle starts. A variation of 10% is acceptable.
 - .5 **Doors nudging times (seconds):** Measured from the time doors are fully opened until the reopening device has been rendered inoperative and sound signal activated. A variation of 10% is acceptable.
 - .6 **Noise level ambient:** Measure in dBa within the cab when parked at typical landing with fan on at low speed, using scale A of an ANSI type 2 sound level meters.
 - .7 **Noise level door motion:** Measure within the cab during a complete door cycle, using scale A of an ANSI type 2 sound level meter. A variation of 10% is acceptable.
 - .8 **Noise level running:** Measure within the cab from bottom to top of hoistway, using scale A of an ANSI type 2 sound level meter. A variation of 10% is acceptable.
 - .9 **Leveling distance:** Measured in mm, this is the distance between car sill and landing sill at the moment the doors are fully opened.
 - .10 **Pre-opening distance:** Measured in mm, this is the distance between car sill and landing sill at the moment the doors start to open.
 - .11 **Door force:** Door closing force is measured in pounds.
 - .12 **Starts / Stops:** Acceleration / deceleration are rated (N) normal, (L) light, (M) medium or (H) high
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- .13 **Ride comfort:** Lateral acceleration are rated (N) normal, (L) light, (M) medium or (H) high

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION