

Canadian space agency
St-Hubert (Quebec)

division 14
elevator 5
specifications

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KJA Consultants Inc.
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SECTION 14 90 00: MAINTENANCE

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with section 14 20 00.

1.2 SCOPE

- .1 Provide labour, materials, products and services necessary for the full maintenance of the equipment.

1.3 CONTRACT DURATION

- .1 Provide full maintenance on the equipment to the maintenance procedures set out in the Specifications for such other periods as may be defined in the Contract Documents.

1.4 PURPOSE

- .1 The purpose of the maintenance program is to prolong the life of the equipment, to secure the Owner's equity and to provide trouble-free service.

1.5 MINIMUM STANDARD

- .1 As a minimum standard, perform to the Specifications and to the Code.
- .2 Maintain the equipment at all times in the same or better condition as at the commencement of the maintenance work.

1.6 REGULAR HOURS OF WORK

- .1 Regular hours of work are from 8:00 to 17:00 Monday to Friday, excluding statutory holidays.

1.7 PROTECTION OF WORK AND PROPERTY

- .1 Maintain protection of work and protect the Owner's property from injury or loss arising out of the execution of this contract.

- .2 Make good any injury or loss caused by your agents or employees.
- .3 Take all necessary precautions to ensure that the work is done in a manner that does not endanger any person.

1.8 MAINTENANCE CONTROL PROGRAM

- .1 At the beginning of the maintenance contract term, provide to the Owner and the Consultant a copy of the Maintenance Control Program for each device (see B44 8.6.1.2.1).
- .2 During the course of the maintenance contract update the Maintenance Control Program as necessary and forward to the Owner and the Consultant a copy of the updated Maintenance Control Program.
- .3 Provide a soft copy of the program in PDF (Acrobat Reader) format.
- .4 Refer to section 01 78 00 - Project file documents - Elements to hand over at the end of the contract.

1.9 COORDINATION WITH OWNER

- .1 Before each routine maintenance inspection contact a representative specified by the Owner.
- .2 Discuss the operation of the equipment with the Owner's representative and take immediate action on problems.
- .3 Should a problem be of a nature that cannot be satisfactorily resolved during the inspection or trouble call, report back to the Owner's representative to explain why it was not possible to correct the problem and when the problem will be resolved.

1.10 ROUTINE MAINTENANCE

- .1 Perform a routine maintenance inspection once a month, as a minimum.
- .2 In the course of the examination, should faulty parts be discovered replace them at once, and should any unusual operations or noises be found take corrective action immediately.
- .3 Schedule parts showing excessive wear for replacement on the next regular examination.

1.11 PERSONNEL

- .1 Supervise your personnel so that they present a neat appearance and their movement in the building is within the requirements of their work.
- .2 Provide uniforms or other obvious means of identification for personnel.

1.12 REPAIRS

- .1 For scheduled repair work, outside of the regular maintenance procedure, give the Owner at least two weeks prior notice.
- .2 For unscheduled repair work, outside of the regular maintenance procedure, give the Owner immediate notice.
- .3 Communicate, in writing, the status of repairs to the Owner at the beginning and close of the normal working day.
- .4 Where possible indicate the time required for completion of repairs.

1.13 SAFETY DEVICES

- .1 At no time permit the equipment to operate while any of the safety devices, mechanical or electrical are in-operative.
- .2 In the event that any of the emergency safety devices such as final limits, safety operated switches, governor switches, overspeed devices, underspeed devices, car safeties, are activated while the equipment is in use by the public submit a written report to the Owner detailing the incident and the corrective action taken.

1.14 RULES OF WORK: ELEVATORS

- .1 Check with and obtain approval from the site building management prior to taking an elevator out of service.
- .2 Keep the site building management informed of work activity including, but not limited to, the following:
 - .1 When an elevator is taken out of service;
 - .2 When an elevator is placed back in service;
 - .3 When starting work each day;
 - .4 When finishing work each day.

- .3 Perform work on an elevator at a floor selected by the site building management.
- .4 Where possible restrict activities to inside the hoistway with the hall doors closed.
- .5 Do not leave materials or tools in the elevator lobbies or other public areas.
- .6 Do not leave an elevator out of service with the hall and car doors open except as approved by site building management.
- .7 When taking an elevator out of service station someone at the entrance so as to ensure that a passenger does not enter and is not trapped in the cab.
- .8 When finished working on the elevator ensure that the elevator is in proper working order.

1.15 MISSED MAINTENANCE

- .1 Should the monthly maintenance not be performed or should the maintenance not be signed as complete in the maintenance log issue a credit for the month.

1.16 DELAY IN MAKING REPAIRS

- .1 Execute promptly the necessary repairs to a non-functioning unit to service.
- .2 Should the initiation of corrective measures required to repair a non-functioning unit be delayed beyond one normal working day (i.e. 24 hours) issue a credit for that unit for the month.

1.17 DIRECTIVES

- .1 Advise the Owner of directives received from the Inspecting Authorities and from the Regulatory Authorities.
- .2 Carry out directives from the Inspecting Authorities and from the Regulatory Authorities within the period of time set out on the directives, working in overtime if necessary to meet the required date, except for those items that are:
 - .1 The responsibility of the Owner;
 - .2 Directives resulting from changes to the existing regulations.

1.18 DEFICIENCIES NOT CORRECTED

- .1 If there is a failure to carry out instructions of the inspecting authorities (except for those items that are the responsibility of the Owner and directives resulting from changes to the existing codes) within the period of time allowed by the authorities issue a credit to the Owner for the cost of the inspecting authority reinspection.

1.19 BUILDING SYSTEM TESTS

- .1 Provide assistance to the Owner for the testing in overtime of building systems such as Emergency Power and Firefighters' Emergency Operation.

1.20 ACCESS CODES

- .1 If the contract is cancelled, provide to the Owner, for those elevator systems or components that have access codes or access tools for commissioning, programming or other purposes, the access tools and a hard copy listing of the access codes.
- .2 If the Owner provides access codes or access tools, preserve these codes and tools confidential for use only on the particular equipment for which the Owner has provided them.
- .3 Change access codes only when authorized in writing by the Owner.

1.21 EQUIPMENT DEFECTS

- .1 Should a defect in the equipment or the design of the equipment become apparent based on experience with this installation or similar installations elsewhere, advise the Owner immediately in writing setting out the steps to be taken to correct the problem.
- .2 Forward to the Owner copies of any memoranda, internal or external, published or unpublished, dealing with actual or potential flaws in the equipment and design.

1.22 CALL-BACK SERVICE

- .1 Provide twenty-four hour call-back service.
- .2 Provide a telephone answering service staffed twenty-four hours per day.
- .3 Provide call-back service during regular working hours.
- .4 At the time the call is placed the Owner may choose to indicate that the call can be handled during regular hours; otherwise, answer the call immediately whether it be in overtime or regular time.

- .5 If "*Emergency call-back service*" is included elsewhere in this specification do not charge for overtime emergency calls, otherwise invoice overtime calls at the difference between the regular time cost and the overtime cost.
- .6 Respond only to calls placed by the Owner except in the case of emergency calls.
- .7 Ensure that calls received by the answering service are transmitted immediately to a responsible person for action.
- .8 Provide regular call-back response within a maximum of two hours from the time a call is placed until the arrival of a maintenance person at the site.
- .9 Provide emergency call-back response within a maximum of 45 minutes from the time a call is placed until the arrival of a maintenance person at the site.

1.23 EMERGENCY CALL-BACK SERVICE

- .1 Provide emergency call-back service 24 hours per day, seven days per week.
- .2 An emergency is a situation such as an entrapment, an incident, an accident, a shut down of more than one elevator in a group or the absence of elevator service to a floor.

1.24 MIS-ADJUSTMENT

- .1 Keep the equipment in substantially new condition and maintain its performance as or better than new.
- .2 Maintain the performance times as per the data tables, as a minimum.
- .3 Do not change any of the elevator adjustments in such a way as to lead to a de-rating of the performance.
- .4 In particular do not:
 - .1 Increase the door open pause times without written instructions from the Owner;
 - .2 Decrease the door operating speed;
 - .3 Change the brake spring setting;
 - .4 Change the brake lift setting;
 - .5 Decrease the acceleration;

- .6 Decrease the deceleration;
- .7 Decrease the contract speed.
- .5 Do not, in the course of routine maintenance or trouble shooting, re-adjust any of those settings which affect the performance of the equipment.
- .6 Should it appear that some setting has changed or some problem has arisen such as to alter the performance of the equipment, arrange that a qualified adjuster with the appropriate tools, manuals and training make the necessary re-adjustments in an organized, systematic way.
- .7 Do not allow ad hoc adjustments to the equipment.

1.25 ASSISTANCE FOR MAINTENANCE INSPECTIONS

- .1 Provide all necessary co-operation and assistance to allow inspections of the equipment.
- .2 In the event that this requires the supply of more than one crew for more than three hours per unit per year, submit a request to the owner for an extra to contract payment.

1.26 CONSULTANT'S REPORTS

- .1 Carry out such maintenance, repair and replacement, as listed on the Consultant's reports.

1.27 MANUFACTURERS' PARTS

- .1 Supply replacement parts identical in make and model to the original parts where at all possible.
- .2 Provide substitutes when genuine parts are not available.
- .3 Where identical parts are not available or a better substitute is available submit the alternative part for the approval of the Owner.

1.28 SUBSTITUTE PARTS

- .1 Where items visible to the general public, in particular exposed finishes and fixtures, are to be replaced, submit drawings, photographs or samples, as required, in ample time for consideration and review.

- .2 Submit samples of metals, plastic laminates and finishes properly identified as to project, location and material.
- .3 Supply materials in accordance with the reviewed samples.
- .4 The review does not include the checking of measurements nor the approval of variations from the Specifications or the Contract Documents.

1.29 MAINTENANCE LOG BOOK

- .1 Provide a maintenance log in a permanently bound journal having pre-numbered pages.
- .2 Indicate in the journal the following information: date, time, name of maintenance man, regular maintenance, regular time callback, over time callback, action taken, work completed, and further repairs required.
- .3 The journal is the property of the Owner.
- .4 Maintain the journal current, on the premises, and available for inspection by the Owner at any time.
- .5 Make entries in ink, legibly, consecutively and without blanks.

1.30 MAINTENANCE DATA SUBMISSION

- .1 Submit data each month for call-backs and maintenance work in an XLS (Excel®) file with each line having the following information: Building ID; Unit ID; Call-back Date; Call-back Time; Response time; Problem description; Corrective action; Elevator contractor; Call type with each item having the following meaning:
 - .1 Building ID: Unique building description such as "Canada Place".
 - .2 Unit ID: Unit name that is used by the building, such as "P3".
 - .3 Call-back Date: Date of call-back in format YYYY/MM/DD as "2012/01/31".
 - .4 Call-back Time: Time call-back received in format HH:MM as "14:21".
 - .5 Response time: Time to response in format HH:MM as "00:35".
 - .6 Problem description: Description of problem as reported by building.
 - .7 Corrective action: Description of work done to correct problem as reported by technician.

- .8 Elevator contractor: Name of elevator contractor as "Otis" or "TKE" or "Schindler" or "Fujitec" or "KONE" et cetera.
- .9 Call type: Type of call as "E" for entrapment, "D" for service disrupting, "M" for minor, "R" for regular maintenance.
- .2 Submit the data for the month on or before the tenth day of the following month.

1.31 TIME TICKETS

- .1 Indicate the section of the normal maintenance schedule on each time ticket with details of the portion of the section completed.
- .2 Submit time tickets for each call-back detailing the cause of the call-back and the action taken.
- .3 If electronic time tickets are used, provide the Owner with 24 hour internet access to the time ticket records.

1.32 ACCIDENTS AND CLAIMS

- .1 In the event of an accident causing death, personal injury or property damage, arising out of or in connection with the equipment or the performance of the work whether on or adjacent to the site advise the Owner immediately giving a verbal report and submit to the Owner within 24 hours of the accident signed written reports from each of the maintenance personnel involved.
- .2 In the event of an injury to anyone working on or using the equipment, take whatever immediate action is necessary to aid the injured person and to prevent further injury to others.

1.33 MAINTENANCE MANUALS

- .1 Supply to maintenance personnel a manual describing proper maintenance procedures and methods of maintaining the equipment in proper order.
- .2 Prior to the start of the maintenance contract give five copies of this manual to the Owner so that his staff may better describe and report problems that arise.
- .3 If, in the course of the maintenance contract, changes are made to this manual, supply to the Owner revised copies of the manual.

1.34 ELECTRICAL DIAGRAMS

- .1 Provide a set of schematic electrical diagrams either covered in clear plastic and mounted on the machine room wall or bound permanently in a durable binder if the diagrams are of dimensions less than 300 mm (12") by 600 mm (24").
- .2 If, in the course of the maintenance contract, changes are made to the wiring or control, supply to the Owner marked-up prints of the altered schematics and field wiring diagrams showing the changes.

1.35 METAL CONTAINER

- .1 Provide in the machine room a metal container for the purpose of storing clean wipers.

1.36 PARTS STOCKED LOCALLY

- .1 Arrange that the following spare parts are available on site (in a metal cabinet with a baked enamel finish), in a service vehicle or from the local maintenance office and allow the Owner, at his request, to inspect these parts:
 - .1 Hall fixtures: two complete hall station assemblies (with call registered light assemblies), four button heads, and a hall lantern of each type;
 - .2 Car operating panel fixtures: three complete car push button switch assemblies (with call registered light assemblies), four button heads, and one position indicator;
 - .3 Car door equipment: two car door sheaves and one set of door gibs;
 - .4 Hall door equipment: one complete hoistway door closer assembly, two interlocks, four hall door sheaves, and two sets of door gibs;
 - .5 Three fuses of each size used in the controller and in the main line disconnect;
 - .6 Relays: one complete relay of each type with spare contacts and coils;
 - .7 Rotary electric equipment: a set of each type of brushes;
 - .8 An adequate supply of cleaning solvent, wipers, general purpose oil and door operator oil.

1.37 PARTS AVAILABLE AS REQUIRED

- .1 Arrange that the following spare parts are available within 48 hours on site and provide to the Owner, at his request, the methods and procedures used to ensure that

this delivery time can be met:

- .1 A printed circuit board of each type used, completely assembled and verified;
- .2 One complete door operator assembly;
- .3 One complete door protective device assembly;
- .4 One complete roller guide assembly of each size used;
- .5 Spares for parts used in quantity on the equipment in the ratio of one spare for every 100 such parts.

1.38 YEARLY REPORT

- .1 Each year, on the anniversary date of the contract, submit to the Owner a report consisting of the following items:
 - .1 A complete summary of the activity for the year including, but not limited to, call backs, repair work, complaints;
 - .2 A certification that the various items as listed above were checked at the specified times and that they were found to be functioning correctly or, if not functioning correctly, notations of the problems and the corrective action taken;
 - .3 An evaluation of the standard of maintenance for the year as compared to prior years and to the standards of the industry for similar installations.

1.39 MAJOR PARTS REPLACEMENT REPORT: ELEVATOR

- .1 Each year, on the anniversary date of the contract, submit to the Owner a report on the anticipated life expectancy of the major equipment components and the budget provisions for their replacement, including following items:
 - .1 Elevator suspension means;
 - .2 The machine.
- .2 Six months prior to termination of the maintenance contract, submit to the Owner a report on the major equipment components that will require replacing in the next five years and, if these components will not be replaced before the end of the contract, reimburse the Owner for the usage on a prorated basis based on the expected lifespan of the equipment.

PART 2 - HYDRAULIC ELEVATOR

2.1 WORK INCLUDED

- .1 Maintain, repair or replace:
 - .1 Hydraulic machine, pump, pump motor, controller, plunger, cylinder, hydraulic fluid, door equipment, elevator intercommunication system, and other mechanical and electrical parts required for the operation of the equipment.

2.2 WORK NOT INCLUDED

- .1 Do not maintain, repair or replace:
 - .1 Buried cylinder without protective plastic casing, cab finishes (including ceiling lights), handrails (except for attachments on the exterior of the cab), flooring, hoistway enclosure, and hall door, sill and frame finish;
 - .2 Electrical conduit and wiring outside the hoistway and machine room;
- .2 Submit, to the Owner, a bid for repairs or the replacement of parts due to vandalism, or for additional changes and costs not covered by the maintenance contract but required by the regulating authority.

2.3 PARTS AVAILABLE AS REQUIRED

- .1 Arrange that the following spare parts are available within 48 hours on site and provide to the Owner, at his request, the methods and procedures used to ensure that this delivery time can be met:
 - .1 One set of packing for the hydraulic jack;
 - .2 One hydraulic valve solenoid coil for each type used on the equipment.

2.4 TOOLS MAINTAINED LOCALLY: HYDRAULIC ELEVATORS

- .1 Arrange that the following tools are available in a service vehicle or from the local maintenance office and allow the Owner, at his request, to inspect these tools:
 - .1 One dial pressure gauge;
 - .2 One air compressor.

2.5 HYDRAULIC OIL

- .1 Do not add hydraulic oil to the system before determining the cause of the loss of oil.
- .2 Receive written authorization from the local service superintendent prior to adding oil with the amount of oil stated and the reason for adding it.
- .3 Transmit to the Owner a copy of this written authorization.
- .4 Do not keep hydraulic oil on site or in service vehicles.
- .5 Maintain stocks of hydraulic oil and access to hydraulic oil under the control of the local service superintendent.

2.6 MONTHLY CHECKS: HYDRAULIC ELEVATOR

- .1 Check the following items at least once each month:
 - .1 Piston gland packing;
 - .2 Oil recuperation system;
 - .3 Door operator;
 - .4 Door reopening device;
 - .5 Car ride and general operation;
 - .6 Levelling;
 - .7 Hall and car door operation;
 - .8 Emergency stop button;
 - .9 Alarm button;
 - .10 Communication system;
 - .11 Door open button;
 - .12 Door force;
 - .13 Car door rollers and eccentrics;
 - .14 Car door clutch assembly;

- .15 Position indicators and signal lamps;
 - .16 Car door contacts;
 - .17 Hoistway door interlocks.
- .2 Perform the following duties at least once each month:
- .1 Check the hydraulic fluid level and record it in the log book;
 - .2 Lubricate and clean car door tracks;
 - .3 Clean the pit;
 - .4 Clean the top of car;
 - .5 Clean machine and machine room floor.

2.7 QUARTERLY CHECKS

- .1 Perform the following duties at least once every three months:
- .1 Clean and vacuum the controller and examine the relays for wear;
 - .2 Check the circuitry and safety devices in the controller;
 - .3 Check the resistors for overheating and repair or correct the problem where necessary;
 - .4 Check the roller guides;
 - .5 Check the emergency lighting.

2.8 SEMI-ANNUAL CHECKS

- .1 Perform the following duties at least once every six months:
- .1 Check the hall door operation;
 - .2 Check the door gibs and cable and sheaves for the door closer;
 - .3 Check and test the final limit switches;
 - .4 Check the special emergency service operation with the Owner present;

- .5 Check the emergency power operation with the Owner present;
- .6 Check the door open pause times to ensure that they are consistent from one car to another in a group;
- .7 Check the load weighing device;
- .8 Check the operating time and make any necessary changes;
- .9 Check the door open pause time cancellation (i.e. monitor) circuit;
- .10 Check the hydraulic machine;
- .11 Check the hydraulic pressure relief valve;
- .12 Check the hydraulic system for leaks as follows:
 - .1 Run the elevator up to the stop ring and raise the pressure to the relief valve setting;
 - .2 Note the gauge pressure reading and record it in the log book;
 - .3 Leave the elevator under pressure on the stop ring for a minimum of twelve hours;
 - .4 After the twelve hours has passed, note the gauge pressure reading and record it in the log book;
 - .5 Set the elevator level with the bottom floor and note the hydraulic reservoir fluid level and record it in the log book;
 - .6 If any significant changes are noted that might indicate a leaking hydraulic cylinder, advise the Owner and take such steps as necessary to ensure the safety of the elevator (Do not add hydraulic oil to the system unless it has been determined that the loss of oil is through the gland packing).
- .13 Check each hoistway door to ensure that the gibs, hangers, upthrust rollers and retainers are intact and properly fastened;
- .14 Check the car door to ensure that the gibs, hangers, upthrust rollers and retainers are intact and properly fastened;
- .15 Check that the gibs and retainers are in place by sliding a steel rule or other similar device beneath the door to make physical contact with the gib or retainer;
- .16 Check the upthrust rollers of each hoistway door by racking the door to ensure that upthrust rollers are intact and properly adjusted;

- .17 Check each hoistway door interlock to ensure that the lock is made up before the car can run;
- .18 Check the car door to ensure that the car cannot run with the car door open.

2.9 YEARLY CHECKS

- .1 Perform the following duties at least once every year:
 - .1 If the cylinder is protected by a sealed plastic sleeve equipped with valves:
 - .1 Detect and remove any liquid between the cylinder and sleeve using an air compressor as per the directives from the cylinder manufacturer;
 - .2 Pressure test the system using an air compressor as per the directives from the cylinder manufacturer.
 - .2 Check the main motor contacts;
 - .3 Replace the filters on the controller air inlets;
 - .4 Check the operation of the overload devices;
 - .5 Check the car operating panels;
 - .6 Check door operator, clean and lubricate pivot points;
 - .7 Clean guide rails;
 - .8 Vacuum hoistways from top to bottom;
 - .9 Open the car operating station, clean and check for loose wires;
 - .10 Check hall buttons and their connections;
 - .11 Check travelling cables for wear;
 - .12 Check hangers and junction box connections;
 - .13 Check guide rail fastenings;
 - .14 Clean and paint machine room floor;
 - .15 Check components and fastenings that under failure might create a dangerous situation (e.g. sheave bolts and welds, gear bolts, car slings et cetera).

END OF SECTION