

Canadian space agency
St-Hubert (Quebec)

division 14
elevator 5
specifications

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KJA Consultants Inc.
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SECTION 14 20 00: GENERAL

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Comply with the requirements of Division 01.

1.2 SCOPE OF THIS SECTION

- .1 This specification covers complete work for the supply, installation and maintenance of an elevator at the Canadian space agency located in St-Hubert (Quebec).
- .2 The proponents must become familiar with the plans and conditions on the project site.
- .3 Provide labour, materials, products, equipment and services necessary for the:
 - .1 supply and installation of a hydraulic elevator designated as 5 in accordance with section 14 24 23 of this specification;
 - .2 maintenance of this elevator until twelve months following Substantial Performance in accordance with section 14 90 00 of this specification.

1.3 DEFINITION OF TERMS

- .1 The term "provide", as used herein, means to supply and install new equipment.
- .2 The term "arrange", as used herein, means to provide the features as indicated.
- .3 The term "unit", as used herein, means any elevator, escalator, dumbwaiter, moving walk, handicap lift or material lift mentioned in this Specification.
- .4 The term "Code" as used herein refers to the CAN/CSA-B44-10 Safety Code for Elevators and Escalators with addendum and updates and including Nonmandatory Appendices (which are deemed mandatory herein) and to the CSA B44.2-10 code for Maintenance requirements and intervals for elevators, dumbwaiters, escalators, and moving walks.
- .5 All terms in the Specifications that are not otherwise defined shall have the definitions as given in the Code.

1.4 SINGULAR AND PLURAL

- .1 In all cases singular and plural shall be interchangeable and shall be applied as required to meet the sense and intent of the Specifications.
- .2 Where the singular is employed it shall be interpreted as necessary, unless otherwise indicated, to apply to all equipment and devices required to produce a complete installation.

1.5 ACKNOWLEDGMENTS

- .1 The proposer acknowledges that the proposer has found no discrepancies nor any ambiguities in the specifications.
- .2 The proposer acknowledges that the related work by other trades as set out in the specifications is adequate for the proposer's equipment.

1.6 EQUIPMENT INSURANCE

- .1 The Owner's insurance policy covers equipment actually in place in the building and accepted by the Owner.
- .2 All other material and equipment is not included in the Owner's policy and such material and equipment is stored at the Contractor's own risk.

1.7 CODES AND ORDINANCES

- .1 Supply equipment and do work in accordance with building codes, by-laws, regulations and requirements of the local, provincial and federal authorities in effect at the time of the execution of the work.
- .2 Supply equipment and do work in accordance with the Code, and any other code which may govern the requirements of the installation.
- .3 Comply with the requirements of the Occupational Health and Safety Act and Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.
- .4 Prior to submission of the proposal and throughout the duration of work, give prompt notification in writing of any regulations or requirements known to be in process which might affect the acceptability of the work.
- .5 If changes in codes or regulations result in extra costs, those taking effect subsequent to the date of proposal submission shall be treated as an extra to the contract.

1.8 ENVIRONMENTAL CONSIDERATIONS

- .1 Refer to section 01 74 19 - Management and removal of garbage.

1.9 PATENTS

- .1 Hold and save the Owner and its officers, agents, servants and employees harmless from liability due to patent or copyright infringement arising from the use of, in the performance of the work or in the completed installation, any invention, process, article, or appliance.

1.10 PRELIMINARY INFORMATION

- .1 Refer to section 01 33 00 - Submittal procedures.

1.11 MEASUREMENTS

- .1 In the execution of the work, verify all dimensions with the actual conditions in order to do a perfect job.

1.12 MATERIALS AND WORKMANSHIP

- .1 Provide all new materials and equipment.
- .2 Install equipment in a neat, accurate, workmanlike manner.

1.13 GENERIC MAINTENANCE

- .1 Arrange that the equipment can be maintained and adjusted by any competent elevator company without the use of proprietary tools, information or equipment or, if such tools, information or equipment are required, provide them (these shall become the property of the Owner).
- .2 Do not incorporate any running time, cycle counters or trip counters that would cause the equipment to shut down or alter its operation in any way.

1.14 OPERATION BY HANDICAPPED PERSONS

- .1 Arrange all controls and fixtures so that they can be readily operated by handicapped persons as described in Appendix E of the Code.

1.15 BILINGUAL MARKINGS

- .1 Provide text of signage and markings visible to the public in both French and English.

1.16 TRADE MARKS

- .1 Do not apply trade marks visible to the general public on any piece of equipment.

1.17 FIXTURE TYPE

- .1 Provide, unless otherwise indicated in the Specifications or Drawings, signal fixtures, such as push buttons, keyswitches and position indicators, from your standard range of products.
- .2 Provide LED illumination.
- .3 Submit samples or illustrations of those types available.

1.18 PAINTING

- .1 Ensure that machine room and hoistway equipment, except for machined surfaces and non-rusting surfaces, is protected with two coats of a rust inhibiting primer of a neutral colour, each coat of 25 micron minimum thickness.

1.19 OPERATING ENVIRONMENT

- .1 Arrange that the equipment be capable of operating normally and within the requirements of the specifications when the ambient temperature is between 3°C (38°F) and 36°C (97°F).
- .2 Arrange that the equipment be capable of operating normally and within the requirements of the specifications when the supply voltage is within minus 15% and plus 10% of the nominal voltage and the frequency is within 5% of the nominal frequency.

1.20 DRAWING AND SAMPLE SUBMITTALS

- .1 Refer to section 01 33 00 - Submittal procedures.

1.21 FINISHES: STAINLESS STEEL

- .1 Provide, unless otherwise indicated in the Specifications or Drawings, stainless steel number four finish for visible natural metal finishes.

- .2 Arrange, unless otherwise indicated in the Specifications or Drawings, that the brush or grain direction of finishes of visible natural metals be vertical.

1.22 TEST DATA FORM: HYDRAULIC

- .1 After completion of the work, and prior to substantial performance, submit a test data form certifying that the unit is complete and ready for inspection.
- .2 Arrange that this form be signed by the person responsible for the performance of the work.
- .3 Include a check list of the items in the specifications as well as other performance data such as door times, operating times, starting and running currents and voltages, operating pressures, slowdown distances, valve settings, and, in general, settings of any adjustable devices.
- .4 List on this form safety devices, together with their settings and indicate as to whether they have been checked and adjusted.
- .5 Submit a soft copy of the data form in PDF (Acrobat Reader) format.

1.23 ELECTRICAL DIAGRAMS

- .1 Supply wiring diagrams and data as required for the execution of the work herein described including schematics for speed control, dispatching system, interfaces, printed circuit boards.
- .2 Incorporate, as part of the schematic diagrams, a reference index ('road map') giving the location of electrical components and wiring interconnections for relay coils, relay contacts, field equipment, integrated circuits and other such devices, so that the position on the schematics of any of these items can be readily determined.
- .3 Supply, prior to the substantial performance inspection, three prints and a soft copy in PDF (Acrobat Reader) format of the wiring and schematic diagrams revised to show changes that have been made.
- .4 If changes are subsequently made to the wiring or control, supply additional hard and soft copies of the schematics and field wiring diagrams incorporating the changes.

1.24 MAINTENANCE MANUAL

- .1 Supply to the Owner prior to the substantial performance inspection, a maintenance manual as set out in the maintenance section of the specifications.
- .2 Incorporate in the manual a description of the controller user interface, fault and error

codes, troubleshooting and diagnostic procedures, methods of use and the adjustment of programmable parameters together with their settings at the time of final adjustment.

- .3 Supply the manual in PDF (Acrobat Reader) format on digital media acceptable to the Owner.

1.25 OPERATION MANUAL

- .1 Supply to the Owner prior to the substantial performance inspection, a manual describing in detail the operation of the equipment including special features, dispatching sequences, and such items as intercom systems and security systems.
- .2 Supply, as part of the manual, as built diagrams and drawings of operating panels (e.g. car panels, central control consoles) with descriptions of the function of switches and indicators.
- .3 Supply the manual in PDF (Acrobat Reader) format on digital media acceptable to the Owner.

1.26 SYSTEM LOG ERROR CODES

- .1 Provide to the Owner a PDF document listing system error codes complete with a full English description of the meaning of each code.
- .2 Incorporate as part of the document a description of the procedure for accessing and resetting the codes.
- .3 Demonstrate this procedure to the engineer.

1.27 SPECIAL TOOLS AND ACCESS CODES

- .1 If any special tools (i.e. tools that are not readily purchased from a hardware supplier) are used to maintain or adjust the equipment or are required for any aspect of the work on the equipment, list these tools with details on the proposal form and provide such tools to the Owner prior to Substantial Performance.
- .2 If any access codes are used to maintain or adjust the equipment or are required for any aspect of the work on the equipment (including the reading and resetting of error codes and logs) list these access codes with details on the proposal form and provide such access codes to the Owner prior to Substantial Performance.
- .3 Do not change the access codes without the written consent of the Owner and, when changed, provide to the Owner the new access codes.

1.28 TECHNICAL SEMINAR

- .1 At the time of total performance, arrange with the Owner to provide a seminar for the Owner's staff.
- .2 Include in the seminar a complete review of the documentation, operation of the equipment and demonstration of any special features.

1.29 CERTIFICATES OF INSPECTION

- .1 Obtain and pay for certificates of approval and all other necessary permits and inspections.
- .2 Prior to Total Performance, arrange for and pay for a safety inspection of the equipment by the regulatory authority or, if that is not available, by a recognized independent private professional inspection organization.
- .3 As a minimum, ensure that this inspection includes:
 - .1 Full load overspeed car safety tests if car safeties are provided;
 - .2 Empty car overspeed counterweight safety tests if counterweight safeties are provided;
 - .3 Pressure tests for hydraulic elevators;
 - .4 Full load full speed car buffer tests if oil buffers are provided;
 - .5 Empty car full speed counterweight buffer tests if counterweight oil buffers are provided;
 - .6 Full load full speed down direction brake tests if a traction machine is provided;
 - .7 Electrical safety circuit check;
 - .8 Door pressure tests;
 - .9 Tests of any other safety devices.
- .4 Submit, prior to Total Performance inspection, the approved safety inspection report.
- .5 Should more than one inspection for a licence or approval be required due to deficient work by others give sufficient advance notice of such deficient work to allow the work to be completed prior to the time of the subsequent inspection.

- .6 If sufficient advance notice of such deficient work has not been given, assume the cost of the additional inspections.
- .7 If the regulatory authority is not available or if the regulatory authority did not designate a private inspection organization, proceed as follows:
 - .1 Perform the safety inspection;
 - .2 Provide a certificate of conformance that covers, as a minimum, the items required under the regulations and includes a checklist of items listed in clause 8.10 of the Code;
 - .3 Provide the Owner and engineer with a soft copy of the certificate in PDF (Acrobat) format at the time the certificate is submitted to the regulatory authority.

1.30 PRE-INSPECTION CHECK LIST

- .1 Upon completion review each page of the specifications and initial each page at the bottom left to indicate that the work has been completed in compliance with the Specifications.
- .2 Submit this initialed copy Specifications to the engineer prior to asking for an inspection by the engineer.

1.31 INSPECTION AND ACCEPTANCE

- .1 Two types of inspection will be carried out by the engineer.
- .2 Initial acceptance inspection: At completion of each unit an inspection will be carried out to see that performance figures, workmanship and equipment furnished are in compliance with the specifications. Provide, for this initial acceptance inspection, a tachometer, a meter, a stop-watch and the necessary test weights to carry out full load tests. Furnish a team of competent persons to assist the engineer in making these tests and inspections.
- .3 Substantial performance inspection: An inspection of the elevator group and group programming will be carried out after completion of the last elevator in the group. Provide two people for one day, to assist the engineer in making these tests and inspections. Advise the engineer when the equipment is prepared for inspection. The engineer will then set a date for inspection.

1.32 WARRANTY OF WORK

- .1 Warrant that the materials, performance and workmanship are in accordance with the industry standard in every respect.

- .2 Make good defects not due to improper use which may develop within one year from the date of substantial performance of the project.
- .3 Warrant that the equipment performs to the standards set out herein.

1.33 PARTS

- .1 Supply parts for a period of fifteen years subsequent to substantial performance of the project.
- .2 Where purchased components are used, ensure that the original manufacturer's name and component designation are clearly marked on the part or in the unit manual.

PART 2 - DESIGN CRITERIA

2.1 DESIGN CRITERIA

- .1 The following list has been used as a base for the work specified in other sections of this specification related to the elevator installation:
 - .1 A locked storage space for the duration of the work.
 - .2 A properly framed and enclosed hoistway containing only the equipment essential to the operation of the elevator with a variation from nominal hoistway dimensions of not more than +25 mm (1.0") (if there are conduits above the suspended ceiling located where the future hoistway will be installed, moving the conduits not related to the elevator operation outside of the hoistway).
 - .3 A machine room with concrete floor, containing only the equipment essential to the operation of the elevator (if the telecommunication equipment installed on the wall interferes with the future machine room location, move the equipment to a location outside of the future machine room).
 - .4 A structure designed for the following reactions:

	kN	lb
on the pit floor, under the car buffer	88	19,900
static load on the pit floor, under each jack	42	9,500

- .5 Supports for the sill support angles, flush with the inside hoistway wall, a minimum of 150 mm (6") in depth, capable of sustaining a minimum unit load equivalent to the capacity of the elevator.
- .6 At each floor and at the top and bottom of the hoistway, supports to fasten the guide-rails to the building structure.

- .7 For hoistway walls not made of concrete, intermediate supports to fasten the upper supports of the cylinders.
- .8 For the access to the pit access door, a space having minimum width and depth equal to the width of the pit access door plus 200 mm (8"), accessible by a ladder located in the machine room, leading to a floor level with the elevator pit floor.
- .9 Grouting under hoistway sills.
- .10 A hoisting beam at the top of hoistway capable of sustaining a 3400 kg (7500 lb) load.
- .11 For the access to the pit access door, a permanent ladder having the following characteristics:
 - .1 solid and non combustible;
 - .2 extending not less than 1200 mm (48") above the sill of the machine room floor, or having handgrips to the same height;
 - .3 equipped with rungs, cleats, or steps at least 400 mm (16") wide spaced 300 mm (12") - the width can be reduced to a minimum of 225 mm (9") if required by the elevator contractor;
 - .4 providing a clear distance of not less than 115 mm (4.5") from the centerline of the rungs, cleats, or steps to the nearest permanent object in back of the ladder;
 - .5 having a clear distance of not less than 115 mm (4.5") from each side rail centerline (if provided) to the nearest permanent object;
 - .6 capable of sustaining a load of 135 kg (300 lb);
 - .7 surrounded by a permanent railing not less than 1070 mm (42") high having an intermediate rail and painted in yellow.
- .12 Waterproofing of the pit.
- .13 For the elevator machine room, an access door:
 - .1 having a minimum width of 915 mm and a minimum height of 2030 mm (80");
 - .2 opening toward the exterior;
 - .3 being self-locking and self-closing;
 - .4 provided with a spring-type lock arranged to permit the doors to be opened

from the inside without a key;

- .5 that can be unlocked from the outside with a key reserved to authorized and elevator personnel.
- .14 For any single or common pit having a depth of more than 3000 mm (10'), an access door:
 - .1 Swinging out of the pit;
 - .2 Provided with a vision panel that is glazed with clear wired glass not less than 6 mm (0.25") thick, that will reject a ball 150 mm (6") in diameter and have an area of not more than 0.03 m² (47 square inches);
 - .3 Providing a minimum opening of 750 mm (29.5") in width and 1825 mm (72") in height;
 - .4 Being located at a maximum of 300 mm (12") from the pit floor;
 - .5 Being self-closing;
 - .6 Kept locked with a key accessible only to elevator personnel but provided with a spring-type lock arranged to permit the door to be opened from inside of the pit without a key.
- .15 Cutting and patching of openings in the wall between the machine room and the hoistway for the passage of conduits.
- .16 Painting of the machine room floor.
- .17 Painting of the hall doors with enamel finishes, if required.
- .18 Sealing or painting of the machine room ceiling and walls to reduce dust.
- .19 For the machine room, an acoustic isolation to reduce the machinery noise propagation outside the machine room by considering a noise level up to 85 dBA in the machine room.
- .20 If a sprinkler system employing water is provided in the machine room, sprinklers having a temperature rating not less than that required for an intermediate temperature classification and protected against physical damage.
- .21 In the elevator pit, a floor drain or sump pump having a capacity to remove a minimum of 11.4 m³/h (3,000 gal/h) per elevator and protected with a cover secured to and level with the pit floor.

- .22 Heating and cooling for the machine room in order to maintain continuously (i.e. 24 hours a day) a temperature of greater than 10 Celsius (50 Fahrenheit) and less than 30 Celsius (85 Fahrenheit) based on the heat generated by the elevator.

	kW	BTU/h
when active	2.3	7,750
when inactive	0.7	2,250

- .23 A power supply capable of supplying the following starting and running currents, with a disconnecting means located in the machine room and the wiring between this disconnecting means and the controller provided by the elevator contractor.

600 V supply / 3 phases / 60 Hz	Current (A)
running	21
starting	53

- .24 Eventually, an emergency power supply sufficient to start and run the elevator at full rated speed and capacity.
- .1 The emergency power will be provided on the same lines and the same disconnect as the normal power.
 - .2 The emergency power unit will have means for switching between the normal power supply and the emergency power supply.
 - .3 Four wires will be provided to connect two auxiliary contacts of the emergency power transfer switch to an elevator controller.
 - .4 One of these contacts will be so arranged that on normal power the two wires associated with it make a closed circuit and on emergency power present an open circuit; the other contact will be so arranged that the two wires associated with it present a closed circuit except for an adjustable period of time (a 5 to 50 seconds adjustment, set initially at 15 seconds) prior to power supply transfer in either direction.
 - .5 The emergency power will feed the 120 V circuit for the cab accessories (lighting and ventilation).
- .25 An auxiliary contact in the main disconnect.
- .26 In the machine room, one 15 A @ 120 V, single phase circuit breaker and the wiring between this disconnecting mean and the controller provided by the elevator contractor. The power for this circuit to be derived from the emergency

power supply (if available).

- .27 In the machine room, one additional 15 A @ 120 V, single phase circuit breaker for the heat exchanger and the wiring between this disconnecting mean and the heat exchanger provided by the elevator contractor.
- .28 In the machine room, 2/32 W fluorescent lights, located in front of the controller at approximately 2500 mm (8') from floor level and such additional fluorescent lighting as required to give a minimum illumination at floor level of 200 lx. The light switch to be located adjacent to the lock side of the machine room door. The power for the lighting circuit to be derived from the emergency power supply (if available).
- .29 In the machine room, a duplex GFI receptacle mounted on the wall.
- .30 In the elevator pit, protected lights, located clear of elevator equipment to give a minimum illumination at pit level of 160 lux and controlled by a light switch located adjacent to the pit entrance and derived from the emergency power supply (if available).
- .31 In the elevator pit, a duplex GFI receptacle mounted on the wall.
- .32 Smoke detectors (or in environments not suitable for smoke detectors, heat detectors) in the machine room and hoistway connected to the elevator controller in the machine room.
- .33 Smoke detectors in each elevator lobby connected to the elevator controller in the machine room.
- .34 For the cab phone, an active telephone line to the machine room, connected to a junction box installed on the elevator controller (phone and junction box provided by the elevator contractor).
- .35 Electric power during erection, for illumination, operations of tools and hoist, starting, testing and adjusting.

END OF SECTION