

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 11 00 SUMMARY OF WORK
- .2 Section 01 14 00 WORK RESTRICTIONS
- .3 Section 01 23 00 ALTERNATIVES
- .4 Section 01 31 19 PROJECT MEETINGS
- .5 Section 01 32 00 CONSTRUCTION PROCEDURES DOCUMENTATION
- .6 Section 01 33 00 SUBMITTAL PROCEDURES
- .7 Section 01 35 43 ENVIRONMENTAL PROCEDURES
- .8 Section 01 52 00 CONSTRUCTION FACILITIES
- .9 Section 01 74 11 CLEANING
- .10 Section 01 74 21 CONSTRUCTION WASTE
- .11 Section 01 77 00 CLOSEOUT PROCEDURES
- .12 Section 01 78 00 CLOSEOUT SUBMITTALS

1.2 REFERENCE STANDARDS

- .1 American National Standards Institute (ANSI)/National Electrical Manufacturers Association (NEMA)
 - .1 ANSI/NEMA MG1-2011, Motors and Generators.
- .2 CSA International
 - .1 ASME A17.1/CSA B44-2007, Safety Code for Elevators and Escalators
 - .2 CSA B651-12, Accessible Design for the Built Environment.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-installation Meetings:
 - .1 Convene pre-installation meeting 1 week prior to beginning on-site installation, with Departmental Representative and Consultant in accordance with Section 01 31 19 - Project Meetings to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building construction sub-trades.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature and data sheets for passenger elevator and include product characteristics, performance criteria, physical size, finish and limitations.

- .3 Shop Drawings:
 - .1 The Owner will provide a copy of the original elevator layout drawing for this installation.
 - .2 Modify this drawing to indicate details and information as follows:
 - .1 Size and location of new machine and controller.
 - .2 Wiring diagrams with location of circuit breaker, switchboard panel or disconnect switch, light switch and feeder extension points in machine room.
 - .3 Location in machine room for connection of travelling cables for car light and telephone.
 - .4 Expected heat generation of equipment in machine room.
 - .5 Cab drawing.
 - .6 Car and hall fixture drawings.
- .4 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% of construction wastes were recycled or salvaged.
 - .2 Recycled Content:
 - .1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of [post-consumer] [post-industrial] content, and total cost of materials for project.

1.5 Project Schedule

- .1 This project has a very tight schedule. The complete work of modernizing both elevators must be substantially complete by March 31, 2019.
- .2 In order to achieve this schedule, the elevator contractor must identify those items for which he will not be submitting approval drawings. Those items which will not require approval drawings are to be ordered immediately upon award of this contract so that installation of the new material can begin as soon as possible.
- .3 For those items for which the contractor requires approved drawings, approval drawings are to be expedited as quickly as possible so that the installation will not have to be suspended, awaiting the arrival of critical material. The Owner's consulting team commits to a very quick turn-around of all approval submissions.

1.6 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Project Record Documents:
 - .1 Record actual locations of equipment, names of equipment manufacturers and suppliers, concealed conduit and boxes, concealed devices, disconnects.
- .3 Operation and Maintenance Data: submit operation and maintenance data for passenger elevators for incorporation into manual.

- .1 Include description of elevator system's method of operation and control including group supervisory control system, motor control system, door operation, signals, firefighter's service, emergency power operation, and special or non-standard features provided.
- .2 Provide parts catalogues with complete list of equipment replacement parts with equipment description and identifying numbers.
- .3 Legible schematic wiring diagrams covering electrical equipment installed, including changes made in final work, with symbols listed corresponding to identity or markings on both machine room and hoistway apparatus.
- .4 Instruct [Departmental Representative in maintenance of special finishes.

1.7 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installer Qualifications: company or person experienced in performing work of this Section specializing in installation of work similar to that required for this project, approved by elevator systems manufacturer with minimum five years documented experience.

1.8 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect elevator components from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Only a limited amount of storage space is available on site. Some materials may need to be stored off-site until they are needed. The Owner will only pay for materials which have been delivered to the site or are stored in bonded warehouse.

1.9 WARRANTY

- .1 The Elevator Contractor shall warrant the equipment installed by him under these specifications against defects in materials and workmanship and will correct any defect not due to ordinary wear or tear or improper use or care which may develop within one year from the date when both cars are turned over complete for the Owner's use and all deficiencies are corrected (total completion of the project).
- .2 12 months warranty period prescribed in Section 01 77 00 Clause 1.3.5 is to commence after the modernization of both elevators is completed with all deficiencies resolved (total completion of the project).
- .3 Project Warranty: Contractor hereby warrants Passenger Elevators 12 months.
- .4 Manufacturer's Warranty: submit, for Departmental Representative's acceptance, manufacturer's standard warranty document executed by authorized company official.

1.10 PHASING OF WORK

- .1 The work of this contract is to be done in phases, one elevator at a time, such that both elevators are not shut down at the same time.
- .2 Co-ordinate the phasing of the work with the general contractor on site who will provide fire alarm signals and other minor electrical work

Part 2 Products

2.1 SYSTEM DESCRIPTION

- .1 Electric general purpose passenger/service elevators, geared type.
 - .1 Traction machine located in the overhead machine room.
 - .2 Accessible Design in accordance with CSA B44 Appendix E and CSA B651.
 - .3 Bilingual Markings: include identification and instructions on operating panels and on signal equipment in English and French except where design is such that inference is obvious and readily understood.
- .2 Design and construct elevator in accordance with ASME A17.1/CSA B44, local codes and regulations.

2.2 PERFORMANCE REQUIREMENTS

- .1 Select and install electric traction passenger elevator components to form complete, operating elevator system meeting the following performance characteristics:
 - .1 Service: general purpose.
 - .2 Operation: microprocessor duplex selective collective.
 - .3 Quantity: 2
 - .4 Maintain the rated net capacity of 4000 pounds for each elevator.
 - .5 Rated speed: 200 FPM
 - .6 Travel distance (nominal): 60'-0"
 - .7 No. of stops: 1 - 5, P = 6 stops or each elevator
 - .8 No. of openings: 6 front and Nil rear for each elevator
 - .9 Inside car dimensions: 7'-0" wide by 6'-0" front-to-back for each elevator
 - .10 Hoistway and car entrance frame opening sizes: 4'-0" wide by 7'-0" for each elevator
 - .11 Door type: Centre-Opening for each elevator
- .2 Hall Calls:
 - .1 Elevators to answer hall calls during working day; within following times:
 - .1 38% of calls within 10 seconds maximum.
 - .2 63% of calls within 20 seconds maximum.
 - .3 80% of calls within 30 seconds maximum.
 - .4 88% of calls within 40 seconds maximum.
 - .5 93% of calls within 50 seconds maximum.
 - .6 95% of calls within 60 seconds maximum.
 - .2 Include smooth acceleration and deceleration of car without perceptible steps so adjusted as not to cause passenger discomfort.

- .3 Elevator to travel between typical floors in not more than 12.5 seconds. Measure time from instant doors start to close until car has stopped level with next floor.
- .3 Fully Regenerative Control:
 - .1 Remove and dispose of the existing controllers and replace them with new controllers.
 - .2 The controller shall be microprocessor-based and incorporate both speed control and dispatching logic.
 - .3 Provide a fully regenerative speed control such the power generated by overhauling loads such as deceleration of the car is filtered and fed back into the building's power supply in a form that can be used by other equipment in the building.
 - .4 The speed control shall be of the Variable Voltage Variable Frequency type employing a solid state motor drive with devices to vary the voltage and the frequency of AC power applied to the drive motor to produce smooth acceleration and slow-down and ensure consistent level stops in both the UP and the Down direction. Use a closed-loop feed-back system to constantly monitor the speed of the car and instantaneously adjust it so that it constantly matches a pre-programmed and adjustable speed curve pattern. Employ a feedback monitoring speed regulation system which will ensure consistent speed pattern regardless of fluctuations in the power supply to the car, weight in the car, direction of travel and all other variables affecting the speed of the car.
 - .5 Automatic Self Levelling Feature: install self-levelling feature which will automatically bring car to floor landings. Correct for over-travel, independent of operating device. Maintain car floor level within 10 mm of landing floor with two-way automatic maintaining levelling device.
 - .6 Provide Duplex Selective Collective operation with solid state "memory" control. Dispatch each car to service car and hall calls in the most efficient manner. Include the following features as a minimum standard: high call reversal and anti-nuisance feature (triggered by either the weight-sensitive floor where the number of calls registered is disproportional to the weight in the car or by the photo-cell door protection device where two consecutive stops are made with no passengers entering or leaving the car).
 - .7 Provide single push buttons at each terminal floor and UP-DOWN push buttons at each intermediate floor, all set at wheelchair height.
 - .8 Arrange that the door open time for a stop in response to a car call shall be independently adjustable from the door open time for a stop in response to a hall call.
 - .9 Include smooth acceleration and deceleration of car without perceptible steps so adjusted as not to cause passenger discomfort.
 - .10 Permit doors to start opening in advance of stop at floor level such that doors are at least 3/4 open when car is stopped level with floor.
 - .11 Provide a letter confirming that the control provided under this contract is not programmed to shut the elevator down after a pre-determined amount of time or number of trips whereby a special proprietary code or device must be applied to the control. If such a feature is provided with the control supplied, provide, in addition, the proprietary device required to restart the elevator plus written instructions on how to use the restart device.
- .4 Independent Service:

- .1 Provide a two-position keyed switch in the car operating station marked "INDEPENDENT SERVICE". With the switch in the "ON" position, the elevator will not respond to hall calls but will stop for car calls only.
- .2 When a car is on Independent Service, hall calls shall be served by the other car only.
- .3 When the elevator stops at a floor, it shall park with its doors open and the doors shall close only when constant pressure is applied to the DOOR CLOSE button.
- .5 Firefighters' Emergency Operation:
 - .1 Under the Electrical Section, Others will provide four signals from the fire control panel or individual smoke sensors to the elevator controller; one signal will indicate a fire at any floor except the Designated Recall Level; the second signal will represent a fire at the Designated Recall Level, the third signal will represent a fire in the elevator hoistway and the fourth signal will represent a fire in the elevator machine room.
 - .2 Provide Phase I Emergency Recall Operation. Provide a three-position keyed switch labelled "FIRE RECALL" and marked " RESET - OFF - ON" in the Designated Recall floor lobby. With the switch in the "OFF" position, in the event of a fire, cause all elevators to travel non-stop to the designated floor and park with doors open; with the switch in the "ON" position, similarly cause all elevators to travel non-stop to the Main floor; with the switch in the "RESET" position, over-ride the fire alarm system.
 - .3 If the fire sensor at the Designated Recall level is activated, cause the elevators to travel to the alternate floor.
 - .4 If the fire sensor in the elevator hoistway or elevator machine room is activated, cause 'fire hat' symbol in the car station to illuminate intermittently.
 - .5 Provide Phase II Emergency In-Car Operation. Provide in the car station a lockable cabinet containing the required controls: a keyed switch marked "FIRE OPERATION" having three positions marked "OFF - HOLD - ON", with the key removable in the "OFF" and "HOLD" positions only; with the switch in the "ON" position, arrange for uninterrupted control of the elevator by the fireman; doors to close by constant pressure on the "Door Close" button; once doors are closed, a car call may be registered; arrange the car to travel non-stop to the selected floor, and park with its doors closed; open doors by constant pressure on the "Door Open" button. When the car is at a landing and the keyed switch is turned to the "HOLD" position, the doors shall remain open and car calls cannot be registered. When the keyed switch in the car is turned to the "OFF" position, the car shall automatically return to the recall floor.
 - .6 Provide a "CALL CANCEL" button. Pressing the "CALL CANCEL" button shall cancel any registered car calls and cause the elevator to stop at the next available floor.
 - .7 The elevator shall be returned to normal operation when the in-car switch is in the "OFF" position and the main floor lobby switch and the switch in the Rescue Station are both in the "OFF" position.
 - .8 Key the Phase I, Phase II and lockable cabinet, plus the Rescue Station to barrel key FEO-K1.
- .6 Machine room: located directly over the elevator hoistway.

- .7 Geared Machine:
 - 1. Remove and dispose of the existing hoist machines and D C drive motors and motor generators and replace them with new geared traction machines driven by separate A C motors suitable for the VVVF application, as described in this specification. .
 - .2 Mount each new hoist machine and motor on new machine beams, designed specifically for this installation and sitting on top of the old machine beams.
- .8 Drive Sheave and Cable Guards:
 - 1. Provide substantial guards to protect maintenance personnel from exposure to the hoist cables and moving parts of each hoist machine.
- .9 Deflector Sheave:
 - 1. Provide conjunction with the new hoist machine a new deflector sheave, mounted on the new machine beams and located so as to obtain a vertical drop of the hoist ropes to the counterweight as indicated on the original layout drawing. Groove the new deflector sheaves to suit the number and diameter of hoist ropes being provided as part of the modernized installation.
- .10 Perimeter Fencing:
 - 1. Provide perimeter fencing to protect room occupants from access to the elevator machines to Workplace Health and Safety standards.
- .11 Hoist Machine Motor:
 - .1 Remove and dispose of the existing D C drive motors from each hoist machine and replace them with a new AC motor suitable for the VVVF application, as described in this specification. The existing motors are 25 H P
 - .2 Prevent absorption of moisture and oil into windings.
 - .3 Ensure one megaohm insulation resistance minimum between motor windings and motor frame.
 - .4 Mount the new motors on the new overhead machines.
- .12 Rope Brake:
 - .1 Provide a rope brake for each hoist machine complete with enabling circuits to prevent the elevator car from overspeeding in the UP as well as the DOWN direction. Also provide circuits to monitor the position of the car within the hoistway so that, if the car travels outside the door zone with its doors open, the rope brake will be applied.
- .13 Car Safeties:
 - .1 Remove and dispose of the existing car safeties.
 - .2 Replace the existing car safeties with new car safeties designed to be automatically reset by moving the car in the UP direction.
 - .3 Repair the hole in the car floor formerly used to allow access for resetting the old car safeties.
- .14 Governor:
 - .1 Remove and dispose of the existing governor on each elevator and replace it with a new governor, arranged to monitor the speed of the car in both the UP and the

- DOWN direction. Provide, in addition, the ability to sense when the car is beginning to overspeed.
- .2 Provide enabling circuits such that, when the car has exceeded its normal operating speed but before it reaches its governor tripping speed, the control shall cause the elevator to travel at reduced speed, stop at the next available floor and shut down with its doors open. Restore the car to automatic operation by cycling the main line switch (after correcting the reason for the overspeed condition).
- .15 Lift Ropes:
- .1 Remove and dispose of the existing lift cables from each elevator and replace them with new lift cables, maintaining the same number and diameter of cables (5 x 5/8").
- .2 Ensure that the total factor of safety of the new cable system is the same as or greater than the original cables. Do not use lift cables with a hardness which may damage the new machine and the deflector sheave.
- .3 If the new ropes supplied are different in material or grade (or number or diameter) from the existing ropes, provide certification from a licensed professional engineer that the material of the existing sheaves is satisfactory for the revised application.
- .4 Provide rope tags to confirm the date when the ropes were replaced.
- .16 Wedge Clamps:
- .1 Supply and install wedge clamp terminations for the new lift cables.
- .2 Properly equalize the tension in each cable to ensure long-wearing characteristics in the new cables.
- .17 Governor Rope:
- .1 Remove and dispose of the existing governor cable on each elevator and replace it with a new governor cable sized to suit the new governor.
- .2 Provide rope tags to confirm the date when the governor rope was replaced.
- .18 Electrical Wiring:
- .1 The existing power supply is 600 Volts 3 Phase, fused with 70 amp One-Time fuses. If the new equipment will require a smaller fuse size, supply and install new fuses of suitable size in the disconnect switch.
- .3 Supply and install complete new wiring for the entire installation, including machine room wiring, fixed hoistway wiring and travelling cables.
- .4 Provide a waterproof and greaseproof covering for the travelling cable. Run the travelling cable in a continuous run from the car to its controller in the elevator machine room without a half-way junction box. Provide shielded wire in the travelling cable for the telephone as well as security card readers and connect this wiring to the existing telephone wiring.
- .5 Provide at least 20% spare wires beyond that required for all components presently in the system.
- .19 Hoistway Switches:
- .1 Provide new terminal and limit switches in the hoistway. Replace the existing STOP switch in each pit.
- .20 Hoistway Access:

- .1 Provide hoistway access keyed switches at the 1st floor (bottom) and Penthouse (top) landing complete with enabling circuits on the controller to permit access to the pit and top of the car.
- .21 Stop Switch in Overhead Space:
 - .1 Supply and install a new Stop Switch in the hoistway within reach of the top floor landing entrance. Alternately, provide a STOP switch on top of the car located such that it can be easily reached while standing on the corridor floor.
- .22 Top-Of-Car Inspection:
 - .1 Remove and dispose of the existing car top stations.
 - .2 Provide a new top-of-car inspection station for each car.
 - .3 Ensure that the complete operation of the top-of-car inspection station complies with 2.26.1.4 of the Elevator Code.
- .23 New Car Station:
 - .1 Remove and dispose of the existing car s car stations and provide complete new car station.
 - .2 Arrange the car operating buttons at the bottom of each car station in accordance with the requirements of Appendix E of the Elevator Code.
 - .3 Provide buttons with a minimum 1 full inch diameter pressel (this is larger than the Appendix E requirement).
 - .4 Provide raised tactile and Braille "fishtail" markings located immediately to the left of each button.
 - .5 Mount key switches for INDEPENDENT SERVICE, LIGHT and FAN, HOISTWAY ACCESS, BATTERY CAB LIGHT TEST and STOP in a separate Service Cabinet.
 - .6 Provide push buttons with fishtail marking plates from your standard product range.
 - .7 Mount the lowest car button at 35'' above the floor. Do not mount any push button higher than 48'' above the floor.
 - .8 Provide keyed switch control for the Penthouse floor such that turning the key will place a car call for the Penthouse floor. Illuminate the P car call button to confirm that a call has been registered. Pressing the P car call button will not register a call.
 - .9 Provide LED illumination for call-registered lights in the car call and ALARM buttons and audible call registered buzzer.
 - .10 Engrave the elevator numbers "E1" and "E2" into the respective car stations.
 - .11 Provide stainless steel certificate holders.
- .24 Service Cabinet:

- .1 Provide a lockable Service Cabinet incorporated into the car station. Design the stainless steel door of the Service Cabinet to be completely flush with the car station for a completely vandal resistant installation.
 - .2 Mount keyed switches for Independent Service, Light, Fan, Hoistway Access, Battery Emergency Cab Lighting Test, Stop and any other devices not required by the general public in the Service Cabinet.
 - .3 Provide also a 120 Volt GFI duplex outlet fused at 15 amps.
- .25 Door Hold Button:
 - .1 Provide a DOOR HOLD button in the car station.
 - .2 Pressing the DOOR HOLD button will extend the door open time to 90 seconds.
 - .3 Pressing the DOOR CLOSE button or any Car Station call button will reduce the remaining door open time to zero.
- .26 Battery Emergency Cab Lighting:
 - .1 Supply and install battery emergency cab lighting.
 - .2 Arrange the controlling circuitry so that when power is removed from the normal lighting circuit, the battery emergency cab lighting will automatically activate and provide sufficient lighting at the Car Operating Panel.
 - .3 Provide batteries of adequate capacity to maintain adequate lighting in the car for a minimum of four hours. Provide an automatic battery charger to maintain the batteries at full charge at all times between uses.
 - .4 Provide a TEST keyed switch in the Service Cabinet to provide a convenient means of testing the emergency cab lighting system.
 - .5 Provide, as part of the emergency cab lighting equipment, an alarm bell connected to the alarm button in the car station. Arrange the alarm bell to sound with or without the normal cab lighting power supply.
- .27 Telephone:
 - .1 Connect the existing telephone line in the elevator machine room to the new Rescue Station specified below.
 - .2 Supply and install a hands-free autodial telephone mounted integral with each car station.
 - .3 Provide a push button in each car station with the telephone symbol.
 - .4 Provide perforations in each car station cover plate for the telephone microphone and speaker so that the telephone is completely vandal resistant.
 - .5 Arrange that when the telephone push button is pressed the phone automatically dials a pre-set number. Program the phone to call the number to be provided by the Owner.
 - .6 Provide a quality telephone such that clear communication is provided for the passengers from any point in the car. Arrange the phone to automatically hang

- up only when the call is terminated from outside the car to allow further calls to be placed.
- .7 Arrange that the phone can receive calls from outside the car. Arrange that the phone can continue to operate during a power failure.
 - .8 Program the telephone so that it automatically announces the building location and elevator number.
 - .9 Wire the car telephone into the Rescue Station specified below.
 - .10 Provide, in addition, one additional station, finished in stainless steel with bevelled edges, to be mounted on the lobby wall at the 2nd floor elevator lobby.
 - .11 Wire the telephones in each car, mentioned above, into this lobby station such that the lobby station can determine from which elevator the call is originating and that only one telephone line is required to handle calls from both elevators.
 - .12 Provide a handset in this station such that emergency personnel can establish and maintain communication with each of the two elevators and override communications to outside of the building.
 - .13 Key the 2nd floor lobby station cabinet door to key FEO-K1.
 - .14 Provide one additional station located in the elevator machine room. Arrange this station to be capable of initiating communication with each elevator car without any action by passengers within the elevator.
 - .15 Be responsible for the complete telephone installation and commissioning including extending the existing telephone line from the elevator machine room to the Rescue Station. Others will provide a 110-Volt power supply to the rescue station. Supply and install complete wiring from the elevator car and from the elevator machine room to the Main floor Rescue Station and from the Rescue Station to the existing telephone line in the elevator machine room.
- .28 Car Position Indicator:
- .1 Remove and dispose of the old Car Position Indicator.
 - .2 Provide a new Car Position Indicator, mounted at the top of the car station. The Position Indicators shall be segmented digital type with 2.2" characters arranged to show the location for the elevator as it travels through the hoistway.
 - .3 Include direction arrows in the Position Indicator to show the future direction of travel of the car
- .29 Floor Passing Gong:
- .1 Provide an audible gong to sound each time the elevator passes or arrives at a floor.
- .30 Car Riding Lantern:
- .1 Supply and install a Car Riding Lantern flush-mounted in each car door post of each car (a total of four fixtures).

- .2 Arrange the control to cause the appropriate arrow to illuminate, indicating the direction in which the car will travel after it closes its door. Provide, in conjunction with the Car Riding Lantern, a gong to sound once for the UP and twice for the DOWN direction.
- .3 Arrange the control so that the Car Direction Lanterns illuminate and chime for each stop, whether for a car call or for a hall call.
- .31 Hall Position Indicator:
 - .1 Provide a Hall Position Indicator with 2.2'' high segmented digital numbers mounted above the 2nd floor entrance.
 - .2 Provide this fixture as a combination hall lantern and position indicator at the 2nd floor.
- .32 Hall Lanterns:
 - .1 Provide Hall Lanterns with gongs over each landing entrance to show the future direction of travel of the elevator.
 - .2 Sound the gong ONCE to indicate a future travel in the UP direction and TWICE if the car is going to proceed DOWN each time the car stops at a floor, whether for a car or for a hall call.
- .33 Hall Call Stations:
 - .1 Remove and dispose of the existing hall push button fixtures.
 - .2 Supply and install a new hall call stations at each landing (a total of 6 fixtures).
 - .3 Provide Braille and tactile markings located to the left of each button.
 - .4 Provide LED illumination for call registered lights in the hall call buttons.
 - .5 Provide stations with call buttons centred at 42'' above the floor.
 - .6 Mount the new hall push buttons in new surface-mounted fixtures.
 - .7 Extend the new cover plates high enough to cover the old back-boxes and to allow the "In Case of Fire..." pictograph shown as Figure 2.27.9 of the B44-07 Code to be engraved on the coverplate.
 - .8 Provide push buttons with fishtail marking plates from your standard product range.
 - .9 Incorporate the new Firefighters' Emergency Operation Phase I keyed switch and indicator lights and the emergency power indicator in the 2nd floor hall push button plate.
- .34 Door operator:
 - .1 Remove and dispose of the existing door operators.
 - .2 Provide a quality gearless door operator powered by a D C motor with SCR drive

or an A C motor with VVVF drive.

- .3 Provide advance door opening so that the doors are $\frac{3}{4}$ open as the car stops level at the floor.
 - .4 Provide door operator control such that the door opening and door closing speeds can be adjusted independently. Provide closed loop position and velocity control for door operator capable of adjusting the point of slowdown and the slowdown torque to compensate for a variety of building conditions. Provide smooth opening and closing and electrical cushioning at final limits of door travel.
 - .5 Adjust the door operator to provide a door open time of 3.5 seconds and a door close time of 4.5 seconds.
 - .6 Provide control to reverse the doors within 2.5 inches of breaking the photocell beam at any point over the entire travel of the doors.
- .35 Provisions for accessibility:
- .1 Provide accessibility features to assist persons with physical disabilities using wheelchairs, as detailed in Appendix E of the Elevator Code. Mount car and hall fixtures at accessibility height; provide audible car and hall call registered sound; provide tactile plates adjacent to car and hall buttons and on landing door jambs; provide multi-beam infra red photo cell protection for car door complete with 3-D protection extending onto the landing; provide car riding lantern in car door jamb complete with gong to indicate future direction of travel of car
- .36 Photo Cells.
- .1 Remove and dispose of the existing multi-beam infra red photocells.
 - .2 Supply and install new multi-beam infra-red photocells to protect the elevator doorway and to provide a 3-D triangular zone of protection on the landing in front of the car doors.
 - .3 Provide at least 40 beams projecting horizontally across the car entrance providing detection over the whole area from 6 inches to 6 feet above the car sill.
 - .4 Provide, in addition, a zone of detection projecting out onto the corridor side of the elevator doors, capable of detecting an obstruction before it enters the doorway.
 - .5 Photocell device shall contain an automatic failure protection feature. Provide a timer so that if the door is held open in excess of 25 seconds by actuation of the photocell device, the photocell may be disconnected from the door open circuit. The doors shall then be allowed to close, but at reduced speed and torque, as detailed in the Elevator Code. In the event of failure of the photocell device or if the device times out, a buzzer shall sound while the doors are closing, to warn passengers that the detection feature is inoperable. In addition, if the triangular portion of the door protection device senses an obstruction but the doorway portion does not and this condition persists for a period of twenty seconds, disable the triangular portion and allow the doors to close with reference to the doorway portion only.

- .6 Initially program the photo cell device so that it does not time out when blocked unless a fire alarm is registered.
- .37 Cab Finishes.
 - .1 Provide new elevator cab components in accordance with the cab drawing.
 - .2 Provide new horizontal plastic laminate wall finish in cab supplier's standard range or rigidized stainless steel as detailed below, mounted directly on top of the existing flat wall cab panels. Supply and install new raised stainless steel foreground mullions separating each panel.
 - .3 Provide a single horizontal sheet finished in rigidized patterned stainless steel mounted below the handrail directly on top of the existing flat wall cab panels on rear wall and each side wall above the existing stainless steel recessed base.
 - .4 Provide for each side wall and rear wall three horizontal panels finished in plastic laminate mounted above the handrail and mounted directly on the existing flat wall finish.
 - .5 Mount all new finishes complete with stainless steel foreground inserts between, above and below each panel.
 - .6 Provide 1½" stainless tubular handrails with ends returned on three walls of cab mounted at 850 mm (2'-10") to 900 mm (3'-2") above the cab floor.



Typical Modernized Wall Panel Layout (with recessed base)



Typical Modernized Raised Stainless Steel Trim Detail

- .7 Provide new 6-panel solid ceiling with down lights as indicated on the cab detail drawing. Light fixtures supplied under Electrical Section and installed by Elevator Section.
- .8 Skin the existing cab header and cab door in brushed #4 stainless steel.
- .9 Sand smooth the car door track to obtain quiet operation of the car door. Replace car door rollers.
- .10 Provide one set of new pads and pad buttons to cover all four walls of Elevator.
- .11 See the attached cab drawings to confirm details.
- .12 Submit complete shop drawings for cab design for approval prior to fabrication.
- .38 Roller Guides:
 - .1 Retain the existing roller guides on the car and counterweight.
 - .2 Replace rollers as necessary to ensure that the operation is inaudible to passengers in car or outside hoistway with car operating at rated speed and car fan turned off.
- .39 Car Apron Plate:
 - .1 Remove the existing car apron plates from site and replace them with new apron plates 48" long.
- .40 Car-Top Guard Rail:
 - .1 Provide metal railings mounted on the top of the car. Mount railings on the rear side and the sides of the car. The railing shall consist of a top rail, an intermediate rail and a toe board, all as described in Clause 2.10.2 of the CAN/CSA B44 Elevator Code.
- .41 Landing Entrances:
 - .1 Retain the existing landing door frames.
 - .2 Remove and dispose of the exiting landing door panels.
 - .3 Provide 12 new sets of centre-opening landing doors finished in stainless steel.
 - .4 Provide doors bearing 1 1/2-hour ULC fire labels.

- .42 Landing Entrance Hardware:
 - .1 Provide fire hooks for each landing entrance designed to retain the door on the door track in the event of a fire.
 - .2 Provide reinforced door gibs for each landing entrance designed to withstand a horizontal force of 1000 pounds applied force at midpoint of the door.
- .43 Landing Entrances Unlocking Devices:
 - .1 Provide hardware so that each landing entrance can be unlocked from the landing using a standard lunar key.
 - .2 Arrange the location of the key hole in the door panel and the lifting tab such that the unlocking key engages the lift rod or other unlocking mechanism with the key extension approximately horizontal, so as to achieve the best lifting action.
- .44 Door Operator Hardware:
 - .1 Supply and install a new door operator clutches for the car doors and new landing door interlocks and hall door pick-up roller assemblies at each landing entrance (a total of 12 sets).
 - .2 Adjust the doors for smooth and quiet operation.
- .45 Door Restrictor:
 - .1 Provide a door restrictor mechanism to prevent the cab door from being opened from the inside of the cab when the car is outside of the landing zone, as defined in the CSA B44 Elevator Code.
- .46 Elevator Identification:
 - .1 Provide letters not less than 75 mm. high above the 2nd floor door header to designate "E1" and "E2".
 - .2 Provide "E1" and "E2" markings 50 mm. high on the hoist machine, controller, governor, main line and lighting disconnect switches and car crosshead.
 - .3 Engrave "E1" and "E2" into the car station.
- .47 Floor Numbers:
 - .1 Provide floor numbers, not less than 100 mm. high, on the hoistway side of the landing doors to indicate floor position.
- .48 Machine Room Door Signage:
 - .1 Provide a professionally manufactured sign to be mounted on the Elevator Machine Room door. The sign shall read:

AUTHORIZED ELEVATOR MAINTENANCE PERSONNEL ONLY!

CAUTION!

Elevator machines.
Rotating moving machinery and parts.
Equipment will start unexpectedly

PERSONNEL D'ENTRETIEN AUTORISÉ DE L'ASCENSEUR SEULEMENT

Mise en garde
Machines d'ascenseur
Machines et pièces mobile rotatives
L'équipement va démarrer de façon inattendue

- .49 Code Data Plate:
 - .1 Provide a data plate permanently mounted on the machine room wall or controller cabinet. The Code Data Plate shall indicate the Code and edition in effect at the time of the original installation as well as the edition of the Code under which this modification is being registered and inspected.
- .50 Confirmation Of Manufacturer's Requirements:
 - .1 Provide a data plate permanently mounted on the machine room wall or controller cabinet to indicate the manufacturer's requirements for the temperature and humidity ranges for the elevator machine room.
- .51 Paint Elevator Pit Floor:
 - .1 After installation of the complete material, completely de-grease the pit floor and paint with suitable grey epoxy concrete floor paint. Also paint the pit channels and buffers.
- .52 Paint Elevator Machine Room Floor:
 - .1 After installation of the complete material, completely de-grease the elevator machine room floor and paint with suitable grey epoxy concrete floor paint. .
- .53 Re-Balance Car And Counterweight:
 - .1 Re-balance the counterweight to equal the weight of the empty car including the new cab finishes plus 1600 pounds (40% of the capacity). Add or remove weights to/from the counterweight as necessary to achieve the above-noted balance.
- .54 Manuals:
 - .1 Provide an operation and maintenance manual, in duplicate (one hard copy and one electronic copy), to include information and instructions for all the new components supplied under this specification. The maintenance manual shall include operation, maintenance and adjusting information as well as a parts catalogue for all components supplied. The operation portion shall describe how each function of the modernized elevator works. The maintenance manual shall detail all maintenance routines and their frequency and all materials recommended to perform complete maintenance. The adjuster portion shall describe the different variables available in the controller and door operator, how to set each variable and recommended settings for this application.

- .2 Provide this manual to the Consultant within one week of the material being delivered on site in order to give the Consultant and Owner sufficient time to review the Manual before the instructional session is presented.
- .3 Provide to the Owner electrical schematic wiring diagrams showing the complete installation.
- .55 Instructions To Owner:
 - .1 Include in your tender price two hours to demonstrate the completed installation to the Owner's staff. Arrange a time suitable to the Owner and conduct the instructional session with reference to the Operations Manual detailed in the Manuals Section above.

2.3 MATERIALS

- .1 Materials: as required to achieve specified performance criteria; functionally compatible with adjacent materials and components.

2.4 POWER SUPPLY

- .1 Confirm that the power supply to the elevators is 600 V, 3 phase, 60 cycles
- .2 Lighting: 120 V, single phase, 60 cycles
- .3 Protect elevator equipment against damage or malfunction due to change to or from normal power supply and emergency power supply.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for elevator installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Consultant.
 - .2 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied

3.2 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheet.

3.3 DOCUMENTS ON SITE

- .1 Maintain on site a complete set of contract specifications and drawings, including all Addenda incorporated into the specification text at the appropriate place, for the use of your mechanic and the Owner.

3.4 WORK TO BE PROVIDED BY OTHERS

This project requires the involvement and co-ordination of a general contractor. The elevator contractor shall use his choice of general contractor or may act as general contractor

himself, provided all the requirements of the specification and duties and responsibilities of a general contractor are provided. Therefore, the word “others” may refer to the elevator contractor who is acting as his own general contractor and refers to trades other than the elevator trade.

The following work will be provided by others in conjunction with this contract.

- .1 The hoistway and machine room are existing and all new equipment must be designed to fit into the existing spaces and is be compatible with those components which are being retained and reused.
- .2 All cutting and making good of building structure necessary to permit proper installation of the elevator and its specified components. Verify with the Structural Engineer that any proposed modifications to the structure are acceptable. Follow the instructions of the Structural Engineer.
- .3 Patch any holes in the elevator machine room floor or walls which are left exposed as a result of equipment removed.
- .4 Provide temporary enclosures or other suitable protection for open elevator hoistway during the time the elevator is being installed.
- .5 All painting, as specified.
- .6 Provide a new pit ladder for each of the two elevator pits. The new pit ladders shall extend from the pit floor level to 4'-0" above the 1st floor level with rungs 12" on centre.
- .7 Provide new single phase disconnect switches fused at 15 amps for the lighting circuit of each new elevator.
- .8 Provide new wiring from the existing three phase disconnect switches and from the new lighting disconnect switches to the new location of each elevator controller.
- .9 Provide a 110 volt power supply for the emergency telephone in the 2nd floor elevator lobby fed on both normal and emergency power.
- .10 Provide new fire sensors at each elevator lobby and wire these fire sensors into the existing fire alarm panel.
- .11 Provide four signals from the fire alarm system to each elevator controller. One signal to represent a fire in the building, one signal to represent a fire at the main recall level (2nd floor), one signal to represent a fire in the elevator hoistway and one signal to represent a fire in the elevator machine room.
- .12 Remove the existing duplex outlet in the elevator pit and two duplex outlets in the elevator machine room and provide new “ground fault interrupter” duplex outlets in place of those removed.
- .13 Provide a dry chemical 3A 40B C fire extinguisher for the elevator machine room.

3.5 INSTALLATION

- .1 Install hoistway, machine room, and other elevator materials and components in accordance with ASME A17.1/CSA B44, local codes, regulations and manufacturer's written instructions.
- .2 Ensure that all materials are on site before commencing the modernization of each elevator.
- .3 Provide barriers as required to separate the hoistways wherever work in one hoistway could result in a worker inadvertently entering the other hoistway.
- .4 Provide protection to floors and corridor walls when moving equipment into and out of the building. Be responsible to repair any damage caused to existing structures and finishes.

3.6 SITE TESTS

- .1 Perform and meet tests required by ASME A17.1/CSA B44.
- .2 Supply instruments and execute specific tests.
- .3 Furnish test and approval certificates issued by jurisdictional authorities.
- .4 Test elevator system by carrying at least rated load

3.7 PREPARATION FOR INSPECTION

- .1 Remove protective coverings from finished surfaces and components.
- .2 Clean surfaces and components ready for inspection.

3.8 ADJUSTING

- .1 Adjust door opening and closing times to suit handicapped users in accordance with Departmental Representative instructions.
- .2 Adjust for smooth acceleration and deceleration of car so as not to cause passenger discomfort.
- .3 Adjust automatic floor levelling feature at each floor.

3.9 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .1 Remove protective coverings from finished surfaces and components.
 - .2 Clean surfaces and components ready for inspection.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.10 PROTECTION

- .1 Protect installed products and components from damage during construction.

- .2 Repair damage to adjacent materials caused by passenger elevator installation to Owner's satisfaction.

3.11 MAINTENANCE

- .1 Furnish complete service and maintenance of the entire elevator systems commencing upon award of the modernization contract and continuing until the warranty has expired one year after total completion of both elevators with all deficiencies completed.
- .2 Warranty maintenance shall be as described in Annex A forming part of this tender specification.
- .3 Standard of maintenance shall be as described in the attached Annex A

END OF SECTION