

PART 1 GENERAL

1.1 DESCRIPTION

- .1 General Requirements: Specified under Division 1 of these Specifications shall apply to and form an integral part of this Section's Work as applicable.

1.2 RELATED SECTIONS

- .1 Section 01000 General Provisions (protection of floor openings and personnel barriers, temporary power and lighting).
- .2 Section 04811 Single Wythe Masonry (filling in masonry hoistway enclosure, knocking out rough openings for entrances, building in hoistway door frames, grouting sills).
- .3 Section 05500 Metal Fabrication (pit ladder, hoist beam, etc.)
- .4 Section 09650 Resilient Flooring
- .5 Division 15 Mechanical (remove existing ventilation equipment from hoistway / remove existing plumbing pipes from hoistway / machine room ventilation / pit waterproofing and drain)
- .6 Division 16 Electrical (electrical supply feeders, wires and switches / telephone (wiring from elevator machine room to telephone controller))

1.3 CASH ALLOWANCE

- .1 The Work of this specification section shall be performed under the cash allowance as indicated in section 01020 – Cash Allowances.
- .2 The information in this section is for coordination and interface with other trades to accommodate the elevator.

1.4 ALL WORK

- .1 In all cases where a device or part of the equipment is referred to in the singular number, provide as many such devices of equipment as are required to complete all Work of the Section.

1.5 SCOPE

- .1 This specification is intended to cover the complete furnishing and installing of one oil hydraulic passenger elevator as detailed except as specified under "Work Excluded from This Section". All Work shall be performed in a Workmanlike manner and is to include all labour and material in accordance with the drawings and as specified herein.

1.6 COOPERATION

- .1 Contractors are encouraged to understand the full intent and scope of the Work before submitting their tender quotations. Where any inconsistency between the various parts of the Specification, details incorporated in the drawings, applicable Codes or standard Industry practice are noted, these shall be brought to the attention of the Contract Administrator in accordance with B4..

1.7 CODES & INSPECTIONS

- .1 All Work shall be performed in accordance with the latest revised edition (as of the date bids are taken) of the CAN/CSA-B44-00 Canadian Standards Association Standard Safety Code for Elevators, Escalators, and Dumbwaiters, the Canadian Standards Association Electrical Code, and/or such Provincial and Local Codes as may be

applicable. The Contractor will obtain and pay for all required government permits, inspections, re-inspections as necessary and licenses.

1.8 DRAWINGS

- .1 The Contractor shall submit Shop drawings showing the general arrangement of the elevator equipment, space requirements, electrical requirements, and load reactions imposed on the building structure. The building shall be constructed to conform to the information shown on the elevator layout drawings.
- .2 If required by the authorities having jurisdiction, the drawings shall bear the stamp of a Professional Engineer registered in the Province where the installation is taking place.
- .3 Approval of the drawings (and other approval forms submitted by the Contractor) shall in no way limit the responsibility of the Contractor to provide a complete installation in accordance with the requirements of this specification.

1.9 SPACE REQUIREMENTS

- .1 Confirm in the submitted tender that all items of equipment in this Contract can be accommodated in the openings and spaces provided, as shown on the drawings. Failure to do so at the time of tender submission will be construed to mean complete acceptance of the design tender documents, and that any adjustment to the building frame, hoistway and pit sizes or other affected Work shall be done at the Contractor's expense. Bidders should note that the hoistway and pit are existing.

1.10 DOCUMENTS ON SITE

- .1 Maintain on Site a complete set of Contract specifications and drawings, including all Addenda incorporated into the specification text.

1.11 WARRANTY

- .1 The 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 each elevator is completed and placed in operation.
- .2 The warranty is not intended to supply normal maintenance service and shall not be construed to mean that the Contractor will provide free service for periodic examination, lubrication, or adjustment due to normal use beyond that included in the Specification; nor will the Contractor correct without charge breakage, maladjustments, or other trouble arising from abuse, misuse or any other causes beyond his control.

1.12 STORAGE

- .1 A dry and protected area, conveniently located to the elevator hoistway, will be assigned to the Contractor without cost, for storage of his material and tools.

1.13 MAINTENANCE SERVICE

- .1 The Contractor shall furnish maintenance and call-back service on the elevator for a period of twelve (12) months after it is completed and placed in operation.
- .2 This service shall consist of scheduled monthly examinations of the equipment, adjustments, lubrication, cleaning, supplies and parts to keep the equipment in proper operation, except such adjustments, parts or repairs made necessary by abuse, misuse, or any other causes beyond the control of the Contractor. All scheduled Work will be done during regular Working hours of the Trade.

- .3 Provide, in addition, 24-hour, seven day per week call-back service to correct any fault which may develop between scheduled visits.
- .4 Provide and maintain on Site or within a reasonable distance of the Site a complete stock of replacement parts, including solid state cards specific to this installation, as required to keep the elevator in running condition at all times. Provide, during regular Working hours, sufficient trained personnel to respond to an unscheduled service call by arriving on Site within one-half hour of when then request for service was placed.
- .5 The City will provide a logbook to be kept in the Elevator Machine Room. Record in the City's logbook the detail of each maintenance visit to the Site. Record each routine scheduled maintenance inspection, a description of Work completed and a listing of any parts replaced. In the event of a call-back, record the reported failure, the finding of the mechanic and the remedial action taken to correct the fault, including a listing of any parts replaced. This logbook shall remain the property of the City and shall remain on Site at all times.
- .6 Provide, as part of the Bid Opportunity, an agreement for a five-year continuing full maintenance Contract to begin upon expiry of the twelve month warranty maintenance period. The on-going maintenance Contract shall be as described for the guarantee maintenance period above. State what escalation, if any, will be applied to the Contract price throughout the life of the Contract. The City may accept this Agreement at any time up to the end of the warranty maintenance period. The City may, at his option, enter into additional five-year extensions of the full maintenance Contract using the same escalation formulae quoted in your Bid Opportunity.

1.14 WORK NOT INCLUDED

- .1 This specification does not include the following Work and is subject to the proper performance of such Work by others.
 - .1 A "legal" hoistway of the exact size specified, properly framed and enclosed and including a pit of proper depth, provided with ladder, drains, lights, access doors, ventilation, and water-proofing if required. Suitable machine room, adequate for the elevator equipment, including floors, grating, foundations, lighting, ventilation and heat. Complete the side hoistway walls in the area of the elevator machine room on the north side of the elevator hoistway and in the area of the ventilation shaft on the south side of the elevator hoistway.\
 - .2 Adequate foundations and supports to carry the loads of all equipment, including supports for guide rail brackets. Total pit reaction equals approximately *65,000 pounds dispersed load, guide rail reaction equals approximately *300 pounds lateral load, both parallel and perpendicular to the hoistway side wall.
 - .3 Provide clear access and make good walls and/or floor for oil line between power unit and jack unit.
 - .4 All cutting and making good of building structure necessary to permit proper installation of the elevator.
 - .5 A rough opening approximately 5 feet wide by 8 feet high at each floor will be knocked out for the installation of the elevator entrances. Finished walls will then be completed by others. Provide adequate wall supports above all entrance frames. The entrance frames are not designed to support overhead wall loads.
 - .6 Provide temporary enclosures or other suitable protection for open elevator hoistway during the time the elevator is being installed.
 - .7 All painting, except as otherwise specified.

- .8 Supply and install sheet vinyl, vinyl tile or carpet flooring for the elevator cab as specified.
- .9 Provide means to ensure that the elevator pit shall remain dry. If the means necessary is a sump pit, ensure that the sump pump is located outside the elevator pit. A drain should include a trap and a back-water valve. The discharge from the sump pump shall be routed in accordance with the local Codes having jurisdiction.
- .10 Provide ventilation as necessary to maintain the machine room temperature between 55 degrees and 90 degrees Fahrenheit. The elevator machinery is expected to produce approximately 12,720 BTU per hour. The machine room should be vented to outside air.
- .11 Remove existing air handling duct from upper floors of hoistway and re-route.
- .12 Remove existing plumbing pipes from hoistway and re-route.
- .13 Provide and maintain proper electric feed wires to the terminals of each elevator control panel with all necessary main line switches, circuit breakers or fused disconnect switches, sized to accommodate a 25 horse power motor.
- .14 Provide separate 120 volts, 15 amp lighting branch circuit to controller with fused disconnect switch in the machine room.
- .15 Furnish, during installation, power of necessary characteristics to provide illumination, operation of required tools and hoist, and for testing and adjusting the elevator and signal equipment.
- .16 Provide permanent light fixtures and switches in pit and machine room. Provide a guard for the pit light fixture.
- .17 Provide permanent dedicated "ground fault interrupter" duplex outlet in the pit and machine room.
- .18 Furnish in place all fixed conduits, wiring and fittings for remote systems (telephones, intercommunications, etc.) with feeders terminating at the elevator controller in the machine room.

PART 2 PRODUCTS

2.1 DESCRIPTION OF EQUIPMENT

- .1 Type:
 - .1 One oil hydraulic passenger elevator complete with twin telescopic hydraulic jack units (or alternately with single telescopic in-ground jack) as manufactured by Otis Canada Inc. or Thyssen Krupp Elevator or approved equal.
- .2 Car Platform:
 - .1 6'-0" wide by 5'-1" deep outside dimensions; locate in a hoistway as shown on the Drawings. This hoistway is existing and therefore cannot be changed and the Contractor must include his own provision to accommodate this hoistway size.
- .3 Capacity:
 - .1 2000 pounds exclusive of car and piston.
- .4 Speed:
 - .1 125 fpm up; 150 fpm down, under full load.

- .5 Travel:
 - .1 35'-2" from Basement floor to 3rd floor
- .6 Stops:
 - .1 Four (4)
- .7 Openings:
 - .1 Four (4) - All at the front of hoistway
- .8 Power Supply:
 - .1 208 or 600 volts, 3 phase, 60 cycles (verify with electrical drawings)
- .9 Entrances:
 - .1 Total of four (4) sets of single-speed power operated entrances designed to provide a clear opening 3'-0" wide by 7'-0" high; doors, sight guards and frames finished in baked on powder coat; 1-1/2 hour Underwriters' labels on hall doors and frames; frames to suit 8" thick block walls; hoistway access switch to be included if required. Provide entrance jamb tactile plates on both entrance jambs at all floors, finished in stainless steel.
- .10 Cab:
 - .1 Passenger cab design with raised plastic laminate panels finished in Formica from Contractor's standard range, mounted on a baked enamel steel shell to The City's colour choice chosen from Contractor's standard range; stainless steel front return panel, entrance posts and header; overall fluorescent lighting; suspended ceiling with translucent panels; single-slide door finished in stainless steel; telephone cabinet and wiring to receive a standard handset phone, specified below; battery emergency lights; tubular stainless steel handrails with ends returned on three walls; one set of protective moving pads complete with brass grommets to match mounting pins.
- .11 Telephone:
 - .1 Supply and install a standard telephone handset with the dialing keypad mounted in the handset. Install the telephone in the telephone cabinet. Provide an engraved lamacoid plaque mounted on the back of the telephone cabinet door complete with instructions, telephone numbers to call in case of an emergency and building location.
- .12 Operation:
 - .1 Selective collective operation with solid-state microprocessor "Memory" control, single push-button at each terminal floor and UP-DOWN push buttons at each intermediate floor, all set at wheelchair height; dispatch car to service car and hall calls in the most efficient manner; automatic levelling and re-levelling; low oil protection, furnish a keyed independent service switch to permit uninterrupted service use of the elevator.
- .13 Provisions for Non-Proprietary Maintenance:
 - .1 Provide a complete adjusters manual with the installation. The adjuster's manual shall detail which operational parameters are software selectable and which are

hardware controlled. Provide a description of how to adjust these parameters and the values which have initially been set for this particular installation. Provide as part of the installation a Field Diagnostic and Adjustment Tool suitable to re-tune the installation should the controller lose all its memory, to read stored faults, etc. Include in the adjuster's manual a description of any coded outputs which the diagnostic tool may display. Provide also one duplicate of each solid state card used in the installation complete with all chips, such that any card may be substituted into the controller and the elevator continue to operate normally.

- .14 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. Hall calls will not register. 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.
- .15 Solid State Starting:
 - .1 Provide solid state closed transition starting for the pump motor such that the inrush current upon starting can be adjusted over a range of two to four times the normal running current of the motor.
- .16 Door Operation:
 - .1 Provide a quality gearless door operator powered by a direct current motor. Provide advance door opening so that the doors are $\frac{3}{4}$ open as the car stops level at the floor. 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 cushioning at final limits of door travel. The door operator shall provide a door open time of 2.5 seconds and a door close time of 4 seconds. Provide control to reverse the doors within 2.5 inches of breaking the photo cell beam at any point over the entire travel of the doors.
- .17 Signals:
 - .1 Provide a digital read-out position indicator in car and over Main Floor entrance. Provide Car and Hall Stations, Position Indicators and Car Direction Lanterns from your standard product range. Illuminate the push buttons in car and at landings with LED indicators to show call registered. Provide a Car Riding Lantern with gong with LED illumination to show the future direction of travel of the elevator. Sound the gong ONCE to indicate a future travel in the UP direction and TWICE if the car is going to proceed DOWN.
- .18 Jack Unit:
 - .1 TWIN TELESCOPIC PISTON Provide a twin jack arrangement with pistons and cylinders located on each side of the car sling, in line with the sling or one in front of the stiles and the other behind the stiles for a completely balanced system. Provide hydraulic cylinders complete with a quality, replaceable packing gland, oil collecting ring and drain tube leading to a collection pail. Provide a three-stage telescopic piston in each cylinder, with each piston of sufficient diameter to maintain the Working pressure of the system at full load below 400

PSI. Arrange the distribution of oil to each piston section such that they remain synchronized and neither piston section runs out of travel before the car reaches either terminal floor. Provide a reliable method of re-synchronizing the piston sections before they run out of travel in a normal run. Provide a uniform polished finish to the piston sections designed to give maximum wear characteristics to the jack packings. The pistons shall be fastened to the crosshead of car sling with substantial bearing plates, adequately gusseted to withstand the forces applied. Arrange that the hydraulic cylinders sit on the existing 5'-6" deep pit floor.

.19 Power Unit:

- .1 Provide a Power Unit located in a machine room at the Basement floor adjacent to hoistway, as shown on the Drawings. The Power Unit shall consist of a squirrel cage motor connected directly to a hydraulic pump designed specifically for elevator service, producing the pressures and volumes required for this installation, all submerged in an oil reservoir. Provide a Valve Unit with independently adjustable, Up Accelerate, Up Slowdown, Up Stop, Down Accelerate, Down Slowdown and Down Stop to provide smooth starts and stops and accurate levelling in both directions of travel.
- .2 If a submersible pump unit is not available for the pressures and volumes required for this installation, provide motor, pump and valves located outside the oil reservoir. Provide minimum 1-inch thick soundproofing material completely surrounding the pump unit to reduce airborne noise.
- .3 Limit the noise produced by the Pump Unit to 85 decibels measured 3 feet from the pump Unit.

.20 Low Pressure Switch:

- .1 Because the pump unit is located below the elevator top of the hydraulic cylinders, provide a low pressure switch to shut the elevator down so that, in the event that the car becomes stuck in the hoistway, opening the DOWN valve will not allow oil to return to the reservoir and reduce the pressure on the column of oil supporting the elevator car.

.21 Muffler:

- .1 Provide a blowout-proof muffler in the oil line, capable of removing all pulsations from the pump unit and resulting in a smooth ride free of vibration. A flexible insert in the oil line is not acceptable under this specification.

.22 Isolation Couplings:

- .1 Provide a minimum of two (2) isolation couplings in the oil line between pump unit and the jack. Each sound isolation coupling shall consist of flanges separated by a gasket of material designed for use with hydraulic oil. Design each sound isolation coupling so that any vibration from the motor or pump is completely absorbed by the coupling and not passed on to the adjacent oil line.

.23 Gate Valve:

- .1 Provide a shut-off valve in the elevator machine room adjacent to the pump unit to isolate the supply of oil in the oil reservoir for maintenance purposes.
- .24 Guide Shoes:
 - .1 Provide swivel-type guide shoes with non-metallic inserts or roller guides mounted on the car frame. Solid guide shoes are not acceptable.
- .25 Provisions for the Handicapped:
 - .1 Provide features to assist handicapped persons using wheelchairs, as detailed in Appendix E of the Elevator Code. Mount car and hall fixtures at handicapped height; provide audible car 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 stainless steel handrails on three sides of car cab; provide car riding lantern in car door jamb complete with gong to indicate future direction of travel of car.
- .26 Photo Cells:
 - .1 Supply and install 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. 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. 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. Photocell device shall contain an automatic failure protection feature. If the door is held open in excess of 25 seconds by actuation of the photocell device, the photocell shall be disconnected from the door open circuit. The doors shall 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.
- .27 Alternate Jack Unit:
 - .1 As an alternative to the twin three-stage telescopic jack units specified in 2.1.18, it is equally acceptable to provide single in-ground a two-stage jack unit mounted under the car.
 - .2 Should the bidder choose to base his quotation on using the alternate jack unit, that price shall include the following:
 - .1 Provide a hydraulic cylinder complete with a quality, replaceable packing gland, oil collecting ring and drain tube leading to a collection pail.
 - .2 Provide a two-stage telescopic piston in the cylinder, with the piston of sufficient diameter to maintain the Working pressure of the system at full load below 400 PSI. Arrange the distribution of oil to each piston section such that they remain synchronized and neither piston section runs out of travel before the car reaches either terminal floor. Provide a reliable method of re-synchronizing the piston sections before they run

out of travel in a normal run. Provide a uniform polished finish to the piston sections designed to give maximum wear characteristics to the jack packings. The piston shall be fastened to the platen beam of car sling with a substantial bearing plate, of adequate strength to withstand the forces applied.

- .3 Supply and install a PVC or HDPE plastic pipe and end cap to completely encase the buried hydraulic cylinder. Seal the plastic pipe, by means of a substantial mechanical connection between the plastic cylinder protection and the steel cylinder, above the pit floor to prevent water entering the pipe should the pit flood. Provide a ½" rigid plastic sampling tube fastened to the side of the hydraulic cylinder and running from the elevator pit to the bottom of the plastic pipe to allow the depth and contents of the plastic pipe to be measured from time to time. Provide a pressure port to connect an air compressor to assist in evacuating the plastic tube. Provide as part of this installation a 20-year guarantee against perforation of the underground cylinder, in conjunction with the elevator maintenance Contract.

As part of the inspection procedure at the end of the job, demonstrate that the plastic PVC pipe is capable of maintaining 40 pounds of air pressure for a period of thirty minutes. (It is recommended that the Contractor perform a similar test after the cylinder has been set in place but before it has been back-filled with sand or the pit closed.)

- .4 Excavate hole for hydraulic cylinder under all soil conditions; including but not limited to casing where required. Include breaking and repairing existing pit floor. Supply and install sand for back-filling

.28 Performance Characteristics:

- .1 Provide a quality of equipment capable of maintaining the following performance levels over the life of the equipment.
- .2 Erect the guide rails plumb to within 1/8 inch over the entire height of the hoistway. Provide guide rails with joints filed smooth so that the car travels throughout the hoistway without any noticeable sideways motion.
- .3 Provide a door operator capable of a door open time of 2.5 seconds and a door close time of 4 seconds. 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. The door operator and associated hardware shall produce less than 70 decibels of noise.
- .4 Adjust the equipment to perform a floor-to-floor run of 12.5 seconds on a typical 8'-8" floor. The floor-to-floor time shall be measured from the instant the doors begin to close until the car is stopped level at the next adjacent floor, with its doors at least ¾ open. This floor-to-floor time shall be achieved in both the UP and the DOWN directions.
- .5 Provide equipment capable of producing not more than 70 decibels of noise with the fan on, measured within the car at any point in its travel and 85 decibels in the machine room with the elevator running in the UP direction.

.29 Instructions to The City:

- .1 Include in the Bid Submission price two hours to demonstrate the completed installation to the City's staff. Arrange a time suitable to the City and conduct the instructional session with reference to the Operations Manual.
- .30 Performance Verification
 - .1 Include in the bid submission price four hours per car to demonstrate the completed installation to the Contract Administrator. To facilitate testing, the Contractor shall provide such tools as a tachometer, sound level meter and other equipment as required to verify that the performance characteristics and optional features have been provided in the finished Work as specified.

PART 3 EXECUTION

3.1 PROTECTION

- .1 Aluminum of ferrous metal; placed next to concrete, protect using one heavy coat of bituminous paint on all surfaces in Contract with concrete.

3.2 INSPECTION

- .1 Existing Conditions: Examine to ensure adequate clearances, reinforcing and the like has been provided as required to ensure for proper installation of Work of this Section.

3.3 INSTALLATION / APPLICATION / PERFORMANCE

- .1 Work: Carry out using trained employees during regular Working hours normal for the trade; perform in a Workmanlike manner as required to include all Work as shown or reasonably implied by the Contract Documents.
- .2 Standard: Conform to the approved manufacturer's latest printed installation directions and recommendations to all applicable codes and regulations, and to recognized good trade practice.
- .3 Hoisting: Include all temporary hoisting facilities required for the placement and installation of the elevator equipment, including but not limited to crane, temporary beams, or any other means.

END OF SECTION