



PRODUCT: IN-GROUND HYDRAULIC ELEVATOR

- DELTA offers a complete line of CSA B44 Elevator Code compliant Passenger and Special Purpose In-Ground Hydraulic elevators for buildings up to 15 m of travel and six floors.
- DELTA In-Ground Hydraulic elevators are available in various sizes and speeds in order to satisfy specific building requirements.
- A full range of cab and entrance options are available on all DELTA In-Ground Hydraulic elevators.

INSTRUCTIONS

This document includes the information required for specifying an In-Ground Hydraulic Elevator.

These specifications require user input as follows:

- Where a choice must be made, such as in selecting materials, the text indicates **[Select...]**, bolded and bracketed.
 - Where an option is available, the text indicates **(Optional Selection(s))**, bolded and in parentheses. Choose the appropriate item and delete the other item(s).
 - Where additional information must be provided the text indicates **(Specify...)**, bolded and in parentheses.
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SECTION 14 20 00

1. GENERAL

1.1. INSTRUCTIONS

- 1.1.1. The Elevator Contractor shall report in writing to the General Contractor / Consultant any defects of surfaces or work prepared by other trades which may affect the quality or dimensions of work. Commencement of the Elevator Contractor's work shall imply complete acceptance of all work by other trades.

2. QUALIFICATIONS

2.1. STANDARDS

- 2.1.1. To establish a standard for tendering purposes, the Drawings and Specifications are based on DELTA Elevator Co Ltd – In-ground Hydraulic Elevator(s) rated at:

[Select one of the following]

910 kg

1134 kg

1365 kg

1587 kg

1815 kg

2050 kg

2275 kg

2500 kg

Other kg (Contact DELTA for this option)

- 2.1.2. Elevator(s) to be DELTA Passenger Elevator(s) or approved equal.
- 2.1.3. Employ only Elevator Contractors who have been satisfactorily supplying and installing similar elevating equipment over a period of at least the immediate past five years.

2.2. QUALITY ASSURANCE

- 2.2.1. Employ fully trained and licensed mechanics who are regularly employed in this field.

2.3. SHOP DRAWINGS

- 2.3.1. Submit five (5) copies of all shop drawings for the Architect to review.
- 2.3.2. Do not commence work until reviewed drawings have been returned.

2.4. GUARANTEE

- 2.4.1. The Elevator Contractor must guarantee the work and materials and must make good all defects (but not those due to ordinary wear and tear or to improper use or care) which may develop within one (1) year from the date of completion provided same has been properly used, oiled, and cared for by a registered Elevator Contractor through a Code compliant maintenance agreement, and provided all payments due by the terms of the contract have been made in full when due.
- 2.4.2. Workmanship and any materials supplied and used in this work to be in strict accordance with this specification.

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2.5. LEED PROJECT

- 2.5.1. Composite wood resins laminate adhesives shall not contain added urea-formaldehyde.

2.6. MEASUREMENTS

- 2.6.1. General Contractor to confirm all hoistway measurements and plumb-ness as per Elevator Contractor shop drawings.

2.7. MAINTENANCE

- 2.7.1. A quality maintenance service consisting of regular examinations at least once a month, adjustments and lubrication of the elevator equipment shall be provided by the Elevator Contractor after the elevator has been turned over for the owner's use for a period of:

[Select one of the following]

Three (3) months

Twelve (12) months

- 2.7.2. All work shall be performed by competent employees during regular working hours of regular working days and shall include emergency 24 hour call back service. This service shall not cover adjustments or repairs due to negligence, misuse, abuse or accidents caused by persons other than the Elevator Contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.

2.8. SCOPE OF WORK

- 2.8.1. Elevator Contractor shall do all work related to the elevator from the main power disconnect to the finished installation of elevator and accessories except for items listed in **s.2.9. WORK BY OTHERS**.

2.9. WORK NOT INCLUDED UNDER THIS CONTRACT BUT SUPPLIED AND/OR INSTALLED BY OTHERS

- 2.9.1. A properly framed and enclosed legal hoistway, including adequate guards and protection of hoistway during the erection period.
- 2.9.2. Hoistway and control room / control space / machine room (as required) and all applicable fire ratings in accordance with elevator, safety, electrical and building Codes. The hoistway must be plumb within 25 mm and not less than the dimensions shown on this layout. All ledges over 100 mm to be bevelled 75° to the horizontal (top and bottom).
- 2.9.3. No conduit, wiring, or piping other than that pertaining to the elevator(s) is permitted in the hoistway or control room / control space / machine room.
- 2.9.4. Sleeves for oil and electric ducts from machine room to hoistway as required. All other blockouts, underpinning, pockets, patching, cutouts, grouting and concrete work where required. For remote machine room, provide fire rated service space around elevator electrical conduit as required by the applicable building code.
- 2.9.5. Access to the control room / control space / machine room space as required by the governing Code or Authority Having Jurisdiction.
- 2.9.6. Suitable control room / control space / machine room space with legal access and ventilation, with concrete floor. Temperature of control room / control space / machine room space to be thermostatically controlled and maintained between 10° C and 32° C. Maximum allowed humidity is 95% non-condensing.

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- 2.9.7. A lockable fused disconnect switch with auxiliary contact for each elevator in the control room / control space / machine room space per the Canadian Electric Code with feeder or branch wiring to controller(s) or starter. Permanent single phase and permanent or temporary three-phase power must be available for elevator equipment installation. Temporary power must meet the specified power requirements.
- 2.9.8. A fused 120 VAC, 15 Amp, single phase, disconnect to each controller for cab lighting. Additional fused 120 VAC, 15 Amp, single phase disconnect for dispatch controller (required for triplex and greater installations), any in-car GFCI duplex receptacles (one disconnect per elevator), oil cooler and / or oil heater.
- 2.9.9. Hoistway ventilation and temperature control required to maintain temperature between 10° C to 32° C. Maximum allowed humidity is 95% non-condensing. Ventilation to be according to local Codes.
- 2.9.10. Adequate supports for buffers, hydraulics, rail brackets, including spreader beams between multiple hoistway if required. Maximum bracket spacing as required by Elevator Contractor. Design for the reaction forces shown on elevator drawings.
- 2.9.11. Front entrance partition walls are not to be constructed until after door frames are in place. If front walls are poured concrete bearing walls, rough openings are to be provided to accept entrance frame and filled in after frames are set. Entrance frames are not designed to support overhead wall loads. Suitable supports for these loads must be provided. If decorative material is applied to listed/certified frames it shall conform to the requirements of the certifying organization.
- 2.9.12. Recesses, as required, to accommodate hall signal fixtures.
- 2.9.13. Entrance wall pocket at rear serving floor(s) as shown. Furring where required.
- 2.9.14. Dry pit reinforced to sustain normal vertical forces from rails and impact loads from buffers and hydraulic jack system. Pit floor not to be poured until cylinder is set in place or adequate clearance provided as per elevator shop drawings. Pit waterproofing, where required.
- 2.9.15. Pit drain always required for elevators with Firefighters' Emergency Operation. Sump pump external to the shaft, where required. Sump hole to be outside hoistway and 600 mm deeper than pit, with trap and backwater check valve. Pit drain/sump pump minimum capacity to be 11.4 m³/hr (3000 usg/hr) per elevator. Design to handle possible oil in sump discharge for hydraulic elevators.
- 2.9.16. Where access to a pit over 900 mm in depth is by means of the lowest hoistway entrance, elevator pit ladder(s) extending a minimum of 1220 mm above the sill of the lowest access door, with centreline of rung 115 mm from wall with 300 mm vertically between rungs. Ladder width is 400 mm. Ladder location as shown on elevator shop drawings. Ladder and attachments shall sustain a minimum load of 135 kg.
- 2.9.17. Any cutting, patching, and painting of walls, floors, or partitions together with finish painting of entrance doors and frames.
- 2.9.18. Necessary electric power for light, tools, hoists, etc., during erection as well as electric current for starting, testing and adjusting the elevator.
- 2.9.19. A hoist beam must be installed in the hoistway overhead as per drawing requirements for elevator construction and maintenance.

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- 2.9.20. Pit lighting level to be minimum 100 LX. Pit to contain a 120 VAC light fixture, switch and GFCI convenience outlet. Switch to be accessible from pit access. All conduits in hoistway to be EMT. Light and convenience outlet to be on a dedicated circuit
- 2.9.21. A self-closing, self-latching, fire rated machine room, control room or control space door, a minimum of 750 mm wide x 2030 mm high with a minimum of 2286 mm clear height below all equipment.
- 2.9.22. Elevator feeders, dedicated ground wire and lockable, fused disconnects wired to the elevator controller.
- 2.9.23. Control room / control space / machine room lighting level to be 200 LX minimum. Must contain a 120 VAC light fixture, switch and GFCI convenience outlet. Switch to be on the lock jamb side of door. All conduits to be EMT.
- 2.9.24. Elevator signalling device in each car wired to terminals in the elevator controller (by Elevator Contractor). Others to provide communication wiring from the elevator controller to the following:
1) For buildings with a rise of less than 18 m – single or multiple elevators – Each to have a separate connection to a location staffed by authorized personnel (may be on or off site). Multiple elevators may be connected to an on-site consolidator (by others). 2) For buildings with a rise of 18 m or more – single and multiple elevators – To a connection at a location within the building that is readily accessible to authorized personnel. A communication control station (supplied by Elevator Contractor) to be provided. General Contractor to supply suitable installation location, others to supply and install wiring from the communication station to elevator controller(s). Depending upon communication station model, a 120VAC, 15 Amp power supply may be required (by others).
- 2.9.25. Provide telephone connection except for the wire from the controller in the machine room, control room or control space to elevator.
- 2.9.26. For elevators with hall or car security features, general contractor to provide (1) "NORMALLY OPEN" dry contact per secure hall or car call in the machine room rated for 120 VAC @ 1 Amp.
- 2.9.27. Fire alarm initiating devices (FAIDs) to be smoke or heat detectors not pull stations. All FAIDs to be wired to a building fire panel (by others). Building fire panel to have (4) "normally open" dry contacts rated for 24 VDC @ 1 Amp. Contact #1 - for main recall level lobby. Contact #2 - for other building floor levels combined. Contact #3 - this is a common contact for a) machine room / control room / control space not located at the recall level and / or b) all hoistway FAIDs above the recall level. Contact #4 - this is a common contact for a) machine room / control room / control space at the recall level and / or b) all hoistway FAIDs at or below recall level. Appropriate contact to close when alarm is initiated. If required, additional fire recall switch (supplied by Elevator Contractor) to be installed by others in building fire panel. All wiring and conduit from building fire panel to elevator controller(s) for FAIDs and additional recall switch by others.
- 2.9.28. Where an emergency or standby power system is provided to operate an elevator in the event of normal power supply failure, then (2) "NORMALLY OPEN" dry contacts rated for 120 VAC @ 1 Amp are to be provided from the emergency power transfer switch and wired (by others) to the elevator controller. One contact (E-POWER) to close when emergency or standby power is in effect. Other contact (pending) to close 10 seconds prior to E-POWER testing to allow elevator to stop at nearest landing. In addition, the following is also required during testing (from normal to e-power and vice versa) and prior to switching from e-power to normal power under regular operation: After the (pending) contact time period has elapsed, e-power system to remove all power from the elevator controller for 15 seconds prior to restart.
- 2.9.29. Finished flooring in elevator cab.

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- 2.9.30. Install guide rail support concrete wall inserts as provided by Elevator Contractor in the location as specified on the shop drawings.
- 2.9.31. Suitable means of access to and egress from location of cylinder well for truck mounted hole drilling rig.
- 2.9.32. Backfill around pit.
- 2.9.33. Provide sand and backfill cylinder.

2.10. CODES

- 2.10.1. Installation, elevator, components, accessories and operation must comply with the CSA B44 Elevator Code currently in effect and all other governing Codes and By-Laws.
- 2.10.2. All welding of elevator components shall be done by a CWB certified company according to CSA Standards W47.1 and W59.

2.11. PERMIT AND INSPECTIONS

- 2.11.1. The Elevator Contractor shall furnish all licenses and permits and shall arrange for and make all inspections and tests required thereby.
- 2.11.2. The General Contractor must complete the TSSA pre-inspection checklist prior to an initial inspection being scheduled.

2.12. KNOW SITE CONDITIONS

- 2.12.1. The Elevator Contractor to be familiar with job conditions on the site.

2.13. MAINTENANCE CONTROL PROGRAM

- 2.13.1. The Elevator Contractor must provide and leave on site a Maintenance Control Program in compliance with the requirements of the CSA B44 Elevator Code. The procedures and logbook of records must be available to the TSSA upon request.

3. PRODUCTS

3.1. ELEVATOR

- 3.1.1. In-Ground Electro-Hydraulic
- 3.1.2. Rated Load:
 - [Select one of the following]**
 - 910 kg**
 - 1134 kg**
 - 1365 kg**
 - 1587 kg**
 - 1815 kg**
 - 2050 kg**
 - 2275 kg**
 - 2500 kg**
 - Other kg (Contact DELTA for this option)**
- 3.1.3. Rated Speed:

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[Select one of the following]

0.40 m/s

0.50 m/s

0.64 m/s

0.75 m/s

3.1.4. Car Inside Dimensions:

[Select one of the following]

910 kg – 1726 mm wide x 1300 mm deep

1134 kg – 2032 mm wide x 1300 mm deep

1365 kg – 2032 mm wide x 1406 mm deep

1587 kg – 2032 mm wide x 1610 mm deep

1815 kg – 1598 mm wide x 2364 mm deep

2050 kg – 1598 mm wide x 2554 mm deep

2275 kg – 1698 mm wide x 2554 mm deep

2500 kg – 2032 mm wide x 2554 mm deep

Custom Size (Contact DELTA for this option)

3.1.5. Hoistway Size: Refer to Architectural Drawings

3.1.6. Operation:

[Select one of the following]

Single Car Selective Collective

(Optional Selections)

Down collective

Two car group (Duplex)

Three or four car group [Select one of the following]

3.1.7. Car Controls: Illuminated Type with faceplate in Stainless Steel #4 finish.

(Optional Selections)

Brushed Bronze #4

Mirror Stainless Steel #8

Mirror Bronze #8

3.1.8. Hall Call Stations: Illuminated type. Stainless steel #4 Cover Plates.

(Optional Selections)

Brushed Bronze #4

Mirror Stainless Steel #8

Mirror Bronze #8

Integrated into Entrance Frame (Simplex Elevators only)

3.1.9. Hoistway Entrances Size:

[Select one of the following]

If 910 kg: 914 mm wide by 2134 mm high

If 1134 to 1587 kg: 1067 mm wide by 2134 mm high

If 1815 to 2050 kg: 1219 mm wide by 2134 mm high

If 2275 kg: 1219 mm or 1372 mm wide x 2134 mm high

If 2500 kg: 1372 mm wide by 2134 mm high

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3.1.10. Entrance Type:

[Select one of the following]

If 910 to 1587 kg (Wide Car): Single Slide Left or Right

If 910 to 1587 kg (Deep Car): Two Speed Left or Right

If 1134 to 1587 kg: Centre Opening

If 1815 to 2500 kg: Two Speed Left or Right

3.1.11. Door Operator: Automatic operator for hoistway and car. Opening and closing speed to suit handicapped requirements.

3.1.12. Travel: Refer to Architectural Drawings.

3.1.13. Stops: Refer to Architectural Drawings.

3.1.14. Openings: Refer to Architectural Drawings.

3.1.15. Power Supply:

[Select one of the following]

208 VAC, 3 phase, 60 Hertz

575 VAC, 3 phase, 60 Hertz

3.1.16. Lighting Supply: 120 Volts, 60 Hertz, 15 Amp

3.1.17. Elevator(s) must comply with the CSA B44 Elevator Code version currently in effect, including Supplements). Elevator(s) must meet the Appendix E Accessibility requirements.

3.2. CAR CAB SPECIFICATIONS

3.2.1. Shell Enclosure:

- Car Top: Minimum 16 ga. (1.5 mm) steel, white enamel finish
- Shell Walls: 16 ga. (1.5 mm) steel - cage frame type construction
- Strike Column: 16 ga. (1.5 mm) Stainless steel #4
- Fascia: 16 ga. (1.5 mm) Stainless steel #4
- Car Doors: 16 ga. (1.5 mm) Stainless steel #4 car door

3.2.2. Architectural Features:

- Side Walls: Raised plastic laminate hang-on panels
(Optional Selection)
Stainless Steel binder channel on raised wall panels
- Front Return: Stainless steel #4
- Car Door: Stainless steel #4
- Base: Black baked enamel finish
(Optional Selection)
Stainless Steel # 4
- Reveals: Black baked enamel finish
(Optional Selection)
Stainless Steel # 4
- Finished Flooring: To be supplied and installed by Flooring Contractor
- Hoistway Doors and Frames:

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[Select one of the following]

At All Floors: Finish to be prime coat (ready for painting by others).

At Typical Floors: Finish to be prime coat (ready for painting by others).

At Main Floor: Stainless Steel #4

(Optional Selections)

Baked Enamel Finish

Stainless Steel # 4

Brushed Bronze #4

Mirror Stainless Steel #8

Mirror Bronze #8

3.2.3. Supplementary Features:

- Lighting: LED strip lighting type mounted above metal egg crate suspended ceiling with 13 mm (1/2") squares

(Optional Selections)

Stainless Steel # 4 Panels with LED down lights

- Ventilation: Two Speed Fan
- Emergency Exit: Top exit in car top in accordance with CSA B44 Elevator Code
- Car sill(s): Extruded Aluminium

(Optional Selection)

Nickel Silver

Stainless Steel

- Overall Height: 2438 mm (8' 0") (2286 mm clear inside)
(Optional Selections – Shaft Overhead must be increased)
2743 mm (9' 0") (2591 mm clear inside)
3048 mm (10' 0") (2896 mm clear inside)
- Car Operating Station: Top row of buttons located in compliance with CSA B44 Elevator Code Appendix E for accessibility
- Handrail: Located on all non-entrance walls: 6 mm x 63 mm Flat Stainless Steel #4

(Optional Selections)

38 mm Round Stainless Steel #4

6 mm x 102 mm Flat Stainless Steel #4

Brushed Bronze #4

Mirror Stainless Steel #8

Mirror Bronze #8

- Pad Hooks: Included
- Protective Pads:
[Select one of the following]
Yes – One set
Not Required

3.2.4. Other Control Features:

- Emergency stop switch (Freight Only)
- Door open button, door close button
- Independent Service: Toggle or key switch
- Phone Button to activate conversation

3.2.5. Service Cabinet. Provide the following:

- Fan toggle or key switch
- Light key switch
- Emergency Light Test key switch

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- Run-Stop key switch
- Access key switch

(Optional Selection)
110 VAC receptacle
Dimmer Switch

- 3.2.6. Emergency Car Lighting: The emergency power unit shall illuminate the elevator car and provide current to the alarm bell (if provided) in the event of normal power failure. The equipment shall comply with the requirements of the current CSA B44 Elevator Code.
- 3.2.7. Entrances: Shall be manufactured in accordance with procedures established by fire testing authorities and shall be labelled for a minimum of 1.5 hours.
- 3.2.8. Sight Guards: Sight guards shall be furnished on the leading edge of the doors to conceal the hoistway beyond the doors. Finish to match door panels.
- 3.2.9. Car Floor Indicator: One (1) to be installed in each car as part of the car station.
- 3.2.10. Hall Floor Indicator: One (1) for each elevator to be installed at main landing.
- (Optional Selection)**
(Specify quantity) for each elevator to be installed at (specify location) landing.
[Select one of the following]
Position Indicator: Integrated into the Entrance Frame
Position Indicator: Separate above the Entrance Frame
- 3.2.11. Certificate Frame. Mounted on:
- [Select one of the following]**
Controller door
Elevator cab wall
- 3.2.12. Car Lantern and Gong: A directional lantern visible from the corridor shall be provided in the car entrance on the same side as the car operating station.
- 3.2.13. Firefighters' Emergency Operation: Provide all requirements for FEO Phase I and Phase II in each elevator.
- 3.2.14. Emergency Power Sequencing: Automatic Standby Building Emergency Power Operation to conform to CSA B44 Elevator Code to allow automatic and manual selection of individual cars to run on emergency power.

(Optional Selection)

Access to all cars at same time requires a generator of sufficient capacity to run all cars at rated load.

3.3. CYLINDER AND PLUNGER (JACK UNIT)

- 3.3.1. The jack shall be designed and constructed in accordance with the applicable requirements of the CSA B44 Elevator Code. It shall be of sufficient size to lift the gross load the height specified, and shall be factory tested to insure adequate strength and freedom from leakage.
- 3.3.2. The jack unit shall consist of the following parts: A plunger of heavy seamless steel tubing accurately turned and polished; a stop ring electrically welded to the plunger to prevent the plunger from leaving the cylinder; a packing seal of suitable design and quality; a drip ring around the cylinder top; a cylinder constructed of steel pipe complete with a pipe connection and air bleeder.

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- 3.3.3. The well for the cylinder, including casing and PVC pipe corrosion protection, shall be sunk into the ground. The cavity between the PVC pipe and the cylinder may be optionally filled with a neutral compound whose density is greater than that of water. Means shall be provided to check the level for the absence of water or the compound and top up the level if required.

3.4. PUMPING UNIT

- 3.4.1. The pumping unit shall be a unit of integral design and shall include an electric motor connected to a pump, a hydraulic control system, a storage tank, necessary piping connections, and a controller, all compactly designed as a single self-contained unit. The motor and pump assembly shall be mounted on a rubber isolated inner base.

3.5. PUMP

- 3.5.1. The pump shall be a positive displacement screw type to give smooth operation and shall be designed and manufactured for elevator service.

3.6. MOTOR

- 3.6.1. The motor shall be of the alternating current, polyphase squirrel cage induction type and shall be of a design adapted to electro-hydraulic requirements.

3.7. HYDRAULIC CONTROL SYSTEM

- 3.7.1. The hydraulic control system shall be of compact design suitable for operation under the required pressures. The control valve shall be a manifold with up, down, and check valve sections. A control section including solenoid valves will direct the main valve and control up and down starting, transition from full speed to levelling speed, up and down stops, pressure relief and manual lowering. Down speed and up and down levelling will be controlled at the main valve sections. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions. All control systems shall be pre-adjusted at the factory.
- 3.7.2. The manual lowering feature shall permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.

3.8. LEVELLING DEVICE

- 3.8.1. The elevator shall be provided with an automatic levelling device which brings the car to a stop within 6 mm (1/4") of the landing level regardless of load or direction of travel. Landing level will be maintained within the levelling zone irrespective of the hoistway doors being open or closed.

3.9. STORAGE TANK

- 3.9.1. The storage tank shall be constructed of steel, and shall be provided with a cover, minimum oil levelling measurement and a filter screen mounted over the suction inlet. Tank design shall incorporate a reserve capacity of no less than 45 litres (10 gallons). An initial supply of oil sufficient for proper operation shall be provided.

3.10. PIPING

- 3.10.1. Pipe of adequate size and thickness shall be installed between the pumping unit and the cylinder head. A shut off valve shall be provided for maintenance and adjusting purposes.

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3.11. CONTROLLER

- 3.11.1. A microprocessor controller shall be provided, including necessary starting switches of adequate size together with all relays, switches and hardware required to accomplish the operation specified. Overload protection shall be provided to protect the motor against overloading.

3.12. CAR STALL PROTECTIVE CIRCUIT

- 3.12.1. A protective circuit shall be provided which will stop the motor and the pump and return the car to its lowest landing in the event the car does not reach its designed landing with a predetermined time interval. This circuit will permit a normal exit from the car but prevent further operation of the elevator until the issue has been corrected.

3.13. WIRING

- 3.13.1. All wiring and electrical interconnections shall comply with the governing codes. Insulated wiring shall have flame retardant and moisture proof outer covering, and shall be run in conduit, tubing or electrical wire-ways. Travelling cables shall be flexible and suitably suspended to relieve strain on individual conductors.

3.14. HOISTWAY OPERATING DEVICES

- 3.14.1. Normal terminal stopping devices shall be provided. When an emergency terminal stopping device is also required, it shall be furnished and the controller switches and circuitry arranged in accordance with the requirements of the CSA B44 Elevator Code.

3.15. PIT SWITCH

- 3.15.1. An emergency stop switch shall be located in the pit.

3.16. PLATFORM

- 3.16.1. The car platform shall have a fabricated frame of formed and structural steel shapes, rigidly welded. Sub-flooring shall be wood floor. The underside of the platform shall be fireproofed. The platform shall be manufactured by a CWB certified shop and be equipped with an aluminium threshold.

3.17. CAR FRAME

- 3.17.1. A suitable car frame fabricated from formed or structural steel members shall be provided with adequate bracing to support the platform and car enclosure. The crosshead shall be of sufficient strength to lift the fully loaded car when slung from the lifting points on the crosshead.

3.18. GUIDES

- 3.18.1. Steel elevator guide rails shall be furnished to guide the car, erected plumb and securely fastened to the building structure.
- 3.18.2. Sliding Guides: Guides shall be mounted on top and bottom of the car for car speeds up to 1.0 m/s. Spring loaded roller guides are optional.

3.19. DOOR OPERATION

- 3.19.1. Doors on the car and at the hoistway entrances shall be power operated by means of a quality operator mounted on top of the car. The motor shall have positive control over the door movement for smooth operation. An infrared detector shall be provided to cause re-opening should an obstruction be sensed.

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- 3.19.2. Door operation shall be automatic at each landing with door opening being initiated as the car arrives at the landing and closing taking place after expiration of a time interval. A car door electric contact shall prevent starting the elevator away from the landing unless the car door is in its closed position.
- 3.19.3. An approved positive interlock shall be provided for each hoistway entrance which shall prevent operation unless all doors for that elevator are closed and shall maintain the doors in their closed position while the elevator is away from the landing. Provide emergency access to the hoistway as required by governing Codes.
- 3.19.4. At each landing served, a hoistway entrance of the type and size as previously described. Each entrance shall consist of flush hollow metal doors with build in hanger assembly, frames assembled for one piece unit installation, extruded aluminium sill, fascia, toe guard, hanger cover, header, hanger track assembly, and formed structural strut supports. Entrance design and construction must be in compliance with NBC 2006 requirements for fire labels.
- 3.19.5. Sill supporting angles required for flush hoistway construction.

3.20. TELEPHONE

- 3.20.1. An ADA-approved AUTODIAL telephone shall be furnished and installed as part of the car station. A separate phone line to the elevator controller shall be provided and located in the elevator machine room under another section of the specifications.

4. OPTIONAL FEATURES (DELETE ITEMS NOT REQUIRED)

4.1. PROVISION FOR CARD READER IN CAR (CARD READER PROVIDED AND INSTALLED BY OTHERS)

4.2. STANDBY BUILDING EMERGENCY POWER GENERATOR OPERATION

[Select one of the following]

Automatic – able to run all elevators simultaneously

Manual – selective lowering and running of elevators

4.3. BATTERY POWERED EMERGENCY LOWERING OPERATION

4.4. OIL HEATER

4.5. OIL COOLER

4.6. PROVIDE EQUIPMENT ACCORDING TO SEISMIC ZONE:

(Specify appropriate zone for project: 0, 1, 2, 3, or 4)

4.7. LOBBY PANEL

- 4.7.1. Provide lobby panel in the central control room. Lobby panel to include for Special Emergency Service Phase I and Phase II, emergency power and one (1) position indicator per elevator.

4.8. ROLLER GUIDES

4.9. NON-PROPRIETARY CONTROLS

- 4.9.1. Elevating device control equipment must be non-proprietary. If a site specific service tool or on-board diagnostic tool is required to render the control equipment non-proprietary, it must be provided with the elevating device. The tool must allow full access to fault codes and maintenance related parameters and must allow complete and thorough maintenance service to be performed by any properly licensed and qualified Elevator Contractor. The tool must come with a user's manual that also defines and explains all error codes, including required fixes. The service tool must remain property of the building owner.

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4.10. PROVISION FOR CARD READER IN CAR (CARD READER PROVIDED AND INSTALLED BY OTHERS)