This document contains standards that are the minimum requirements for BCIT construction projects. The information in the document is organized using the MasterFormat® and SectionFormat® systems. It is not a specification; it is intended to supplement the Consultant's own documents. Do not use this as a standalone specification.

SECTION 14 21 00
ELECTRIC TRACTION ELEVATORS

PART 1 - GENERAL

1.1 SUMMARY

.1 Provide overhead geared traction passenger elevators.

.2 Provide car capable of carrying a stretcher in the full open position.

.3 Perform work to the current Elevator Code CAN/CSA-B44.1-14/ASME A17.5-14, and BCBC 2012 requirements.

.4 Obtain and pay for the services of a professional engineer licensed to practice in British Columbia. Prior to start of work the engineer signing and sealing drawings shall submit S-B. At end of project, engineer shall submit schedule S-C.

.5 Coordinate with Division 26 for card reader access.

.6 Materials not identified in these standards must be identified and approved by the Owner and be approved by the Authority Having Jurisdiction.

1.2 REFERENCES

.1 British Columbia Building Code, 2012 Edition (BCBC).

.2 CSA C22.1-15 Canadian Electrical Code, Part I (23rd edition), Safety Standard for Electrical Installations, Update No. 1 (2015).

.3 CSA-B44-13/ASME A17.1(2013) Safety Code for Elevators and Escalators (Bi-national standard, with ASME A17.1-2013).

.4 CSA-B44.1-14/ASME A17.5-14 Elevator and Escalator Electrical Equipment, Includes Update No. 1 (August 2014).

1.3 SUBMITTALS

.1 Submit in accordance with Section 01 33 00 Submittal Procedures.

.2 Product Data: Submit manufacturer's product data for each system proposed for use. Include the following:

.1 Signal and operating fixtures, operating panels and indicators.

.2 Cab design, dimensions and layout.

.3 Entrance door and frame details.

.4 Power Information: Horsepower, starting current, running current, machine and control heat release, and electrical requirements.

.3 Shop Drawings: Shop Drawings shall be sealed by an engineer licensed to practice in the Province of British Columbia. Include the following:

.1 Plans, elevations, sections, and large-scale details indicating service at each landing.

.2 Machine room layout.

.3 Car, guide rails, buffers and other components in hoistway.

.4 Maximum rail bracket spacing.

.5 Maximum loads imposed on guide rails requiring load transfer to building structure.

.6 Maximum loads on pit floor during dynamic support of car and buffer engagement.

.7 Loads on hoisting beams.

.8 Travel of car.

.9 Clear inside hoistway, overhead and pit dimensions.

.10 Location and sizes of access doors, hoistway entrance frames, and rough openings required.

.11 Expected heat dissipation of elevator equipment in machine room (BTU/hr or kW).

.12 Electrical requirements for power supply.

.13 Finishes: Door and frame finishes, cab interior finishes.

.4 Samples: For each exposed finish.

.5 Closeout Submittals:

.1 Operations and Maintenance Manuals: Provide manufacturer's standard operations and maintenance manual. Include operation, maintenance, adjustment, and cleaning instructions, trouble shooting guide, renewal parts catalogues, and electrical wiring diagrams.

.2 Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on Drawings, and electrical service, including emergency generator, as shown and specified, are adequate for elevator system being provided.

.3 Inspection and Acceptance Certificates and Operating Permits: As required by Authorities Having Jurisdiction for normal, unrestricted elevator use.

.4 Software: Submit one backup copy of the control system software for the Owner’s exclusive use. The Owner agrees that the software shall be used for archival purposes only and will not be sold or given to any other party or individual and will not be used for any other purpose.

.5 Warranty: Submit manufacturers and installers standard warranty.

1.4 QUALITY ASSURANCE

.1 Installer: Elevators shall be installed by the manufacturer or an installer approved by the manufacturer.

.2 Regulatory Requirements: Elevator system design and installation shall comply with the latest versions of CAN/CSA-B44 and the BC Building Code (BCBC) including supplements.

.1 Elevator shall be designed to comply with accessibility requirements of BCBC.

.3 Permits and Inspections: Provide licenses and permits and perform required inspections and tests.

.4 Pre-installation Conference:

.1 Prior to beginning work of this Section, convene a pre-installation conference. Owner, Consultant, and contractors with adjacent or related work shall attend.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Coordinate delivery of elevator material throughout construction.

.2 Store elevator materials in protected environment in accordance with manufacturer recommendations.

.3 Deliver materials to site in manufacturer/installer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer/installer.

.4 Store materials in clean, dry area indoors in accordance with manufacturer/installer's instructions.

.5 Protect materials during handling and installation to prevent damage.

1.6 WARRANTY

.1 The guarantee period shall extend for one (1) year from the date of completion, or acceptance of beneficial use, whichever is earlier. The guarantee excludes ordinary wear and tear or improper use, vandalism, abuse, misuse, or neglect or any other causes beyond the control of the elevator contractor.

1.7 MAINTENANCE SERVICE

.1 Provide maintenance service consisting of examinations and adjustments of the elevator equipment for a period of twelve (12) months after date of Substantial Performance.

.2 Maintenance service shall be provided by elevator manufacturer’s recommended service personnel. Manufacturer’s recommended parts and supplies shall be used in maintenance service as in the original manufacture and installation.

.3 Manufacturer’s trained Installers shall make periodic examinations and perform work including necessary adjusting, greasing, oiling, and replacing parts to keep elevators in operation, except parts that require replacement because of accidents, vandalism, misuse, or negligence by parties other than manufacturer/installer.

.4 Maintenance service be performed during regular working hours of regular working days and shall include regular time call back service. Should Owner request repairs or adjustments be made outside of Installer’s regular working hours, Owner will compensate Installer for overtime premium, travel time, and expense at normal billing rates.

.5 Maintenance service shall not include adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents.

1.8 PROPRIETARY INFORMATION

.1 Software: Submit one backup copy of control system software for exclusive use of the Owner. Owner agrees that software shall be used for archival purposes only and will not be sold or given to other party or individual and will not be used for any other purpose.

.2 Proprietary material, information or data contained in equipment, component or feature, remains the property of the elevator manufacturer. This includes, but is not limited to, tools, devices, manuals, software, source codes, access codes, object codes, passwords and remote monitoring features, which is deactivated if elevator contractor maintenance is discontinued.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

.1 Manufacturers: Subject to compliance with specifications the following manufacturers are acceptable:

.1 Thyssen Krupp Elevator.

.2 Or approved alternative.

2.2 MATERIALS AND COMPONENTS

.1 General: Provide manufacturer's standard elevator systems, published by manufacturer as included in standard pre-engineered elevator systems and as required for a complete system.

2.3 EQUIPMENT - MACHINE ROOM COMPONENTS

.1 Controller: Microcomputer based control system to perform all functions of safe elevator operation. System shall also perform car and group operational control.

.1 High voltage (110V or above) contact points inside the controller cabinet shall be protected from accidental contact in a situation where the controller doors are open.

.2 Controller shall be separated into two distinct halves; motor drive side and control side. High voltage motor power conductors shall be routed so as to be physically segregated from the rest of the controller.

.2 Machine: Machine shall be of the gearless double-wrap traction type with the motor, brake, and traction sheave mounted on a single bedplate. Sound isolation pads shall be installed to reduce vibration and noise transmission to the building structure.

.3 Drive: Variable Voltage Variable Frequency AC drive system shall be provided. The system shall be non-regenerative.

.4 Governor: Car safety shall be operated by a centrifugal speed governor located at the top of the hoistway in the machine room, secondary machine room, or in the overhead area accessible by an access door.

2.4 EQUIPMENT - HOISTWAY COMPONENTS

.1 Hoistway Operating Devices:

.1 Emergency stop switch in the pit.

.2 Terminal stopping switches.

.3 Car positioning unit.

.2 Buffers: Oil type or Helical coil spring type (for speeds of 200 fpm or less) for car and counterweight at the bottom limits of travel.

.3 Guide Rails: Tee-section steel rails with brackets and fasteners.

.4 Hoist ropes: Traction steel with size and quantity to provide proper traction, safety factor, and elastic stretch of less than .07 inches per 150 lb. (68 kg) person at the lowest landing. Governor ropes: steel. Ropes shall consist of at least eight strands wound about a sisal core center.

.5 Fascia: Galvanized sheet steel shall be provided at the front and rear of the hoistway as required to meet maximum horizontal loading zone clearances.

.6 Hoistway Entrances:

.1 Entrance assembly design: Entrance frame shall be of bolted construction for complete one-piece unit assembly. Horizontal members of entrance frame shall consist of integral header track and sill support channel connected together with vertical strut channels on each side. Design of decorative entrance jambs and head shall permit their installation into entrance opening before or after assembly with entrance frame. Frames shall be securely fastened to each other in line with tie angles anchored to the hoistway structure. Use suspended weight closers to ensure positive closing of hall doors. Entrance doors shall be of open rib construction with low friction polymer gibs mounted to steel mounting plates. Door rollers are to be 75 mm (3 in.) root diameter minimum.

.2 Fire Rating: Entrance and door assemblies shall have a ULC fire rating of at least 2 hours.

.3 Entrance jambs and head shall be finished with stainless steel, #4 finish.

.4 Door shall be finished with steel, #4 finish.

.5 Sills shall be stainless steel.

.6 Entrance Markings: Mark entrance jambs with 102 x 102 mm (4 x 4 in.) plates having raised floor markings with Braille adjacent. Provide markings on both sides of the entrance.

2.5 EQUIPMENT - CAR COMPONENTS

.1 Car Frame: Constructed of formed steel structural shapes or extruded structural steel. Provide adequate bracing to support the platform and car enclosure.

.2 Car Safety: Integral to the carframe and shall be Type "B", flexible guide clamp type [or Type "A" instantaneous type (for speeds of 150 fpm and grossload of 7200 lb. or less (including 125% of capacity)).

.3 Platform, Class A (passenger) Loading Type: Platform shall not have direct steel to steel contact with the car frame. The platform shall be isolated from car frame with rubber mounts. The car platform shall be designed to accommodate one-piece loads weighing up to 25% of the rated capacity, such as wheeled food carts, stretchers, x-ray equipment, etc.

.4 Cab Shell Walls: Modular design with suitable openings that enable cab shell assembly from inside of the car. Constructed of 16 gauge sheet steel painted with grey prime coat.

.5 Cab Top: Constructed of 14 gauge sheet steel with integral wire ducts and rib reinforcement. Painted with white powder coat on both sides.

.6 Emergency Car Lighting: An emergency power unit, built into the top of car operating panel, employing 12 volt, sealed rechargeable battery shall be provided to illuminate the elevator cab and provide current to the emergency alarm bell in the event of a building power failure.

.7 Ensure an electrical contact is provided on the car-top exit per applicable elevator code.

.8 Utility Outlet: A 120V 15 amperes utility outlet with ground-fault circuit-interrupter protection shall be built into the top of car operating panel.

2.6 ACCESSORIES

.1 Protective pad hooks and quilted fire retardant protective pads.

2.7 EQUIPMENT - SIGNAL DEVICES AND FIXTURES

.1 Car-Operating Panel: Provide a panel which contains all push buttons, key switches, and indicators for elevator operation. Provide raised tactile numerals and Braille for each push-button. Car Fixture Finish: stainless steel, #4 finish.

.1 Hinged swing car operating panel shall be furnished. It shall contain a bank of mechanical illuminated buttons. Push buttons shall be flush mounted to the panel and marked to correspond to the landings served. Panel shall feature an alarm button, door open and door close buttons, stop/run switch, light switch, independent service switch and fan switch. The alarm button shall be connected to a bell that serves as an emergency signal.

.2 Car Position Indicator: LED dot-matrix display car position indicator shall be integral to the car operating panel.

.3 Cab Emergency Lighting Fixture: A 12V battery powered emergency lighting fixture containing 2 bulbs shall be integral to the car operating panel. Locate just below the car position indicator to provide lighting as required by code.

.4 Car Riding Lantern and Chime: Provide a directional lantern visible from the corridor in the car entrance post. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime shall sound. Chime shall sound once for UP and twice for DOWN. As the car travels, the chime shall sound in the car to tell a passenger that the car is either stopping at or passing a floor served by the elevator.

.5 Hall Call Stations: Provide a single riser of hall call stations at all floors and shall contain all push buttons, key switches, and indicators as required for elevator operation. Hall Fixture Finish: stainless steel, #4 finish.

.1 Applied flush mount faceplates shall be furnished with boxes to be set in corridor walls. The fixtures shall be located such that the center of the call button(s) is at an elevation of 1070 mm (42 in.) above the finished floor. They shall contain mechanical call buttons illuminated up and down as required.

2.8 FINISHES - CAR ENCLOSURES / CAB INTERIORS

.1 General: Where stainless steel is specified it shall be No. 4 Finish.

.2 Cab Enclosures and Hoistway Entrances: Provide manufacturer's standard stainless steel car enclosures, and as follows, unless indicated otherwise.

.3 Cab Flooring: Homogenous composition 100% synthetic rubber, 3.17 mm thick. Acceptable product:

.1 Rounded round raised disk pattern, by Johnsonite, or approved alternative.

.2 Pattern and colour as selected by Consultant from manufacturer’s full range.

.4 Floor Base: Stainless steel sheet, 3 mm thick, No. 4 finish.

.5 Door Frames: Stainless Steel. Sound deaden doors and frame.

.6 Cab Doors: Stainless Steel.

.7 Cab front return, transom, soffit and strike-panels: Stainless Steel.

.8 Cab Walls: Horizontal grade standard plastic laminate self-edged panels, 1 mm thick minimum. Colour to be selected from manufacturer’s full range.

.9 Handrails: Minimum 38 mm (1-1/2 in.) diameter stainless steel handrails on non-access walls or other approved graspable design. Mount handrails at 810 mm (32 in.) above the finished floor and 38 mm (1-1/2 in.) clear of finished walls.

.10 Ceiling: Manufacturer’s standard plastic laminate, horizontal grade.

.11 Removable Panels: Fabricate cab walls of 16-gauge sheet steel painted with black powder paint and perforate for hardware to mount removable panels. Laminate to be selected by Consultant from the manufacturer's standard selection.

.12 Cab Lighting: Valance lighting complete with energy efficient fluorescent lighting with power factor corrected ballasts to provide ample and consistent lighting in all areas of the cab. Lighting level in elevators shall be 100 lux minimum measured at floor level.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Inspect hoistway, hoistway openings, pits and machine rooms. Verify critical dimensions. Examine supporting structures and conditions under which elevator work is to be installed. Do not proceed with elevator installation until unsatisfactory conditions have been corrected. Correct unsatisfactory conditions including dimensional discrepancies or other conditions detrimental to proper installation or performance of elevators.

.2 Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

3.2 INSTALLATION

.1 Install elevators in accordance with manufacturer’s instructions, reviewed Shop Drawings, and Code requirements. Install equipment, guides, controls, car and accessories in accordance with manufacturer installation methods and recommended practices.

.2 Properly locate guide rails and related supports at locations in accordance with manufacturer's recommendations and approved shop drawings. Anchor to building structure using isolation system to minimize transmission of vibration to structure.

.3 Securely fasten hoistway frames to fixing angles mounted in hoistway. Coordinate installation of sills and frames with other trades.

.4 Lubricate operating system components in accordance with manufacturer recommendations

3.3 TESTING AND INSPECTIONS

.1 Perform recommended and required testing in accordance with Authority Having Jurisdiction.

.2 Obtain required permits and provide originals to Owner's Representative.

3.4 DEMONSTRATION

.1 Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain elevators. Review emergency provisions and train Owner's personnel in procedures to follow in identifying sources of operational failures or malfunctions.

3.5 ADJUSTING, CLEANING, AND PROTECTION

.1 Adjust elevators for proper operation in accordance with manufacturer/installer's instructions. Adjust elevators for smooth acceleration and deceleration of car so not to cause passenger discomfort.

.2 Adjust doors to prevent opening of doors at landing on corridor side, unless car is at rest at that landing, or is in leveling zone and stopping at that landing.

.3 Adjust automatic floor leveling feature at each floor to within 6 mm (1/4 in.) of landing.

.4 Repair minor damages to finish in accordance with manufacturer/installer's instructions and as approved by Consultant.

.5 Remove and replace damaged components that cannot be successfully repaired as determined by Consultant.

.6 Clean elevators promptly after installation in accordance with manufacturer/installer's instructions.

.7 Do not use harsh cleaning materials or methods that could damage finish.

.8 Protect installed elevators from damage during construction in accordance with the negotiated temporary use agreement between Owner and manufacturer's installer.

END OF SECTION

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SECTION 14 24 00
HYDRAULIC ELEVATORS

PART 1 - GENERAL

1.1 SUMMARY

.1 Provide hydraulic elevators as indicated and specified with accessories required for a complete installation.

.2 Provide car capable of carrying a stretcher in the full open position (elevator No. 1).

.3 Perform work to the current Elevator Code CAN/CSA B44.1-14/ASME-A17.5-14,and BCBC 2012 requirements.

.4 Obtain and pay for the services of a professional engineer licensed to practice in British Columbia. Prior to start of work the engineer signing and sealing drawings shall submit S-B. At end of project, engineer shall submit schedule S-C.

.5 Coordinate with Division 26 for card reader access.

.6 Materials not identified in these standards must be identified and approved by the Owner and be approved by the Authority Having Jurisdiction.

.7 Sustainability Goals - Mandatory Compliance: comply with allowable VOC levels for all adhesives, sealants, paints and other coatings as outlined in Division 1.

1.2 REFERENCES

.1 British Columbia Building Code, 2012 Edition (BCBC).

.2 CSA C22.1-15 Canadian Electrical Code, Part I (23rd edition), Safety Standard for Electrical Installations, Update No. 1 (2015).

.3 CSA-B44-13/ASME A17.1(2013) Safety Code for Elevators and Escalators (Bi-national standard, with ASME A17.1-2013).

.4 CSA-B44.1-14/ASME A17.5-14 Elevator and Escalator Electrical Equipment, Includes Update No. 1 (August 2014).

1.3 SUBMITTALS

.1 Submit in accordance with Section 01 33 00 Submittal Procedures.

.2 Product Data: Submit manufacturer's product data for each system proposed for use. Include the following:

  .1 Signal and operating fixtures, operating panels and indicators.

  .2 Cab design, dimensions and layout.

  .3 Entrance door and frame details.

  .4 Power Information: Horsepower, starting current, running current, machine and control heat release, and electrical requirements.

.3 Shop Drawings: Shop Drawings shall be sealed by an engineer licensed to practice in the Province of British Columbia. Include the following:

  .1 Plans, elevations, sections, and large-scale details indicating service at each landing.

  .2 Machine room layout.

.3 Car, guide rails, buffers and other components in hoistway.

.4 Maximum rail bracket spacing.

.5 Maximum loads imposed on guide rails requiring load transfer to building structure.

.6 Maximum loads on pit floor during dynamic support of car and buffer engagement.

.7 Loads on hoisting beams.

.8 Travel of car.

.9 Clear inside hoistway, overhead and pit dimensions.

.10 Location and sizes of access doors, hoistway entrance frames, and rough openings required.

.11 Expected heat dissipation of elevator equipment in machine room (BTU/hr or kW).

.12 Electrical requirements for power supply.

.13 Finishes: Dolor and frame finishes, cab interior finishes.

.4 Samples: For each exposed finish.

.5 Closeout Submittals:

.1 Operations and Maintenance Manuals: Provide manufacturer's standard operations and maintenance manual. Include operation, maintenance, adjustment, and cleaning instructions, trouble shooting guide, renewal parts catalogues, and electrical wiring diagrams.

.2 Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on Drawings, and electrical service, including emergency generator, as shown and specified, are adequate for elevator system being provided.

.3 Inspection and Acceptance Certificates and Operating Permits: As required by Authorities Having Jurisdiction for normal, unrestricted elevator use.

.4 Software: Submit one backup copy of the control system software for the Owner’s exclusive use. The Owner agrees that the software shall be used for archival purposes only and will not be sold or given to any other party or individual and will not be used for any other purpose.

.5 Warranty: Submit manufacturers and installers standard warranty.

1.4 QUALITY ASSURANCE

.1 Installer: Elevators shall be installed by the manufacturer or an installer approved by the manufacturer.

.2 Regulatory Requirements: Elevator system design and installation shall comply with the latest versions of CAN/CSA-B44 and the BC Building Code (BCBC) including supplements.

.1 Elevator shall be designed to comply with accessibility requirements of BCBC.

.3 Permits and Inspections: Provide licenses and permits and perform required inspections and tests.

.4 Pre-installation Conference:

.1 Prior to beginning work of this Section, convene a pre-installation conference. Owner, Consultant, and contractors with adjacent or related work shall attend.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Coordinate delivery of elevator material throughout construction.

.2 Store elevator materials in protected environment in accordance with manufacturer recommendations.

.3 Deliver materials to site in manufacturer/installer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer/installer.

.4 Store materials in clean, dry area indoors in accordance with manufacturer/installer's instructions.

.5 Protect materials during handling and installation to prevent damage.

1.6 WARRANTY

.1 The guarantee period shall extend for one (1) year from the date of completion, or acceptance of beneficial use, whichever is earlier. The guarantee excludes ordinary wear and tear or improper use, vandalism, abuse, misuse, or neglect or any other causes beyond the control of the elevator contractor.

1.7 MAINTENANCE SERVICE

.1 Provide maintenance service consisting of examinations and adjustments of the elevator equipment for a period of twelve (12) months after date of Substantial Performance.

.2 Maintenance service shall be provided by elevator manufacturer’s recommended service personnel. Manufacturer’s recommended parts and supplies shall be used in maintenance service as in the original manufacture and installation.

.3 Manufacturer’s trained Installers shall make periodic examinations and perform work including necessary adjusting, greasing, oiling, and replacing parts to keep elevators in operation, except parts that require replacement because of accidents, vandalism, misuse, or negligence by parties other than manufacturer/installer.

.4 Maintenance service be performed during regular working hours of regular working days and shall include regular time call back service. Should Owner request repairs or adjustments be made outside of Installer’s regular working hours, Owner will compensate Installer for overtime premium, travel time, and expense at normal billing rates.

.5 Maintenance service shall not include adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents.

1.8 PROPRIETARY INFORMATION

.1 Software: Submit one backup copy of control system software for exclusive use of the Owner. Owner agrees that software shall be used for archival purposes only and will not be sold or given to other party or individual and will not be used for any other purpose.

.2 Proprietary material, information or data contained in equipment, component or feature, remains the property of the elevator manufacturer. This includes, but is not limited to, tools, devices, manuals, software, source codes, access codes, object codes, passwords and remote monitoring features, which is deactivated if elevator contractor maintenance is discontinued.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

.1 Subject to compliance with specifications the following manufacturers and products are acceptable:

.1 ThyssenKrupp.

.2 Or approved alternative.

2.2 ELEVATORS - CAPACITY AND SPEED

.1 Capacity: 2,500 lbs. Speed: minimum 100 fpm.

2.3 ELEVATOR FEATURES

.1 Elevator Controls and call buttons: provide at accessible height.

.2 Voice Communication: Provide each elevator with a vandal resistant, autodialing, hands free speaker/microphone type telephone mounted in a stainless steel plate and flush mounted into the elevator front return panel.

.3 Telephone: Provide telephone with a clearly marked and identified button to initiate the telephone call. Phone shall be located within 1370mm (4 ft. 6 in.) of finished floor.

.4 Door Operation: Provide a high speed heavy duty variable speed door operator and related equipment. Door operator shall be capable of operating the doors smoothly and quietly at the time indicated in the performance requirements specified herein.

.5 Elevator doors shall remain open for at least 5 seconds and shall close slowly to allow extra time for people with disabilities.

.6 Door Re-Opening Device: An infrared multi-beam 3- Dimensional door re-opening device shall be provided to monitor the door opening and protect passengers from the closing doors. The device shall scan the area between the entrance frames in addition to the area directly in the path of the car doors for obstructions and shall stop and reopen the doors shall a person or other obstruction be detected.

.7 Operating Buttons - Illumination & Size: Illumination of all operating buttons shall be provided from a long life LED source rated for 100,000 hours operation and shall be clearly visible in the ambient lighting levels. The use of large or oversized buttons is encouraged for ease of use by persons with limited mobility and visual impairments. An example of a suitable button would be the US85 Button available from Dupar Controls Inc. (web: www.dupar.com).

.8 Position Indicator - Car: Digital position indicator with an LED or Vacuum Fluorescent Segment or Dot Matrix display. Mount indicator a minimum of 1980mm (6 ft. 6 in.) above the finished floor level in the cab for easy viewing. The position indicator display shall contain a segment which displays the direction or intended direction of the travel of the car.

.9 Position Indicator - Hall: Locate at the ground floor level. Indicator display: same as the indicator provided in the elevator cab.

.10 Hall Lanterns: Hall lanterns at all levels with double stroke electronic chime with an adjustable volume control to visually and audibly indicate the direction of travel. Hall lanterns shall provide advanced warning of the arrival of an elevator at a landing and shall illuminate and sound approximately 3 seconds prior to the arrival of the car and door opening.

.11 Hydraulic elevator drives shall be equipped with an in-rush current limiting device or electronic soft start device to reduce the peak starting current to 150% of the full load running current or less.

.12 Hydraulic elevator pumps, motors, piping and other components shall be sized and suitably rated for a duty of no less than 80 motor starts per hour.

2.4 EQUIPMENT - MACHINE ROOM COMPONENTS

.1 Hydraulic System: Compact design suitable for operation under the required pressure.

.2 Power Component: Direct coupled motor and pump mounted in the hydraulic-fluid storage tank. Pump shall be of the positive displacement type specifically manufactured for oil-hydraulic elevator service.

.3 Control Valve: Control flow for up and down directions hydraulically and include an integral check valve.

.4 Controls:

.1 Control section including control solenoids shall direct the main valve and control.

.2 Up and down starting, acceleration, transition from full speed to levelling speed, up and down stops, pressure relief and manual lowering.

.3 Functions: Fully adjustable for maximum smoothness and to meet contract conditions.

.4 System to be provided with a muffler, low-pressure switch and a shut-off valve.

.5 Controller: A microprocessor-based controller with necessary starting switches, relays, switches, solid-state components and hardware required for operation, including door operation, as described herein. Three (3) phase.

.6 Overload Device: To protect the motor against overloading.

.7 Manual Lowering: Feature to permit lowering the elevator at slow speed in event of power failure or for adjusting purposes.

.8 Pressure Switch.

2.5 EQUIPMENT - HOISTWAY COMPONENTS

.1 Plungers and Cylinders: Construct cylinders of steel pipe of sufficient thickness suitable for the operating pressure. Equip the top of each cylinder with a cylinder head with a drip ring to collect oil seepage, an internal guide ring and self-adjusting packing. Construct plunger of selected steel tubing or pipe of proper diameter machined true and smooth with a fine polished finish. Provide plunger with a stop ring electrically welded to it to prevent plunger from leaving the cylinder. Install plungers and cylinders plumb to permit free operation with minimum friction.

.2 Car Guide Rails: Tee-section steel rails with brackets and fasteners.

.3 Spring Buffer: Helical coil spring type.

.4 Wiring: Wiring for hoistway electrical devices included in scope of the elevator system, hall panels, pit emergency stop switch, and the traveling cable for the elevator car.

.5 Hoistway Entrances:

.1 Frames 14-gauge (2 mm) sheet steel - Entrance Frames: Bolted construction for complete one-piece unit assembly. Securely fasten frames to fixing angles mounted in the hoistway. Sills: Extruded aluminum.

.2 Doors: Entrance doors shall be of hollow metal construction with vertical internal channel reinforcements.

.3 Fire Rating: Entrance and doors shall be ULC fire rated for 1-1/2 hour.

.4 Entrance Finish: Primed for paint finish.

.5 Elevator to be finished with #4 Stainless Steel.

.6 Entrance Markings: Entrance jambs shall be marked with 100mm x 100mm (4 in. x 4 in.) plates having raised floor markings with Braille adjacent. Markings shall be provided on both sides of the entrance.

.7 Sight Guards: Black sight guards will be furnished with door.

2.6 EQUIPMENT - CAR COMPONENTS

.1 Platform, Heavy Loading Type: Arrange car platform to accommodate one-piece loads weighing up to 25% of the rated capacity, such as wheeled food carts, stretchers, furniture and residential equipment. Recess platform to suit flooring as specified in Section 09 65 00 Resilient Flooring.

.2 Emergency Car Lighting: An emergency power unit employing a 6 volt, sealed rechargeable battery and totally static circuits shall be provided to illuminate the elevator car and provide current to the emergency siren in the event of building power failure.

.3 Emergency Bell: Bell mounted on top of the car that is activated when the Alarm button in the car operating panel is engaged. Bell shall have a rated sound pressure level of 80 dba at a distance of 3 m (10 ft.) from the device and respond with a delay of not more than 1 second after the switch or push button has been pressed.

.4 Exhaust Fan: An exhaust fan shall be mounted on the car top.

.5 Utility Outlet: A 125V, 15 amperes utility outlet with ground-fault circuit-interrupter protection shall be furnished on top of the cab.

.6 Bumper Rail: Flat solid metal, 6 x 200 mm (2-3/8 x 4 in.) satin stainless steel provided on the sides and rear of the car enclosure.

.7 Threshold: Stainless Steel.

.8 Ensure electrical contact is provided on the car-top exit.

2.7 EQUIPMENT - SIGNAL DEVICES AND FIXTURES

.1 Car-Operating Panel: A panel shall be provided which contains all push buttons, key switches, and message indicators for elevator operation. Raised markings and Braille markings shall be provided for each push-button.

.2 Car Fixture Finish: Satin stainless steel.

.1 Applied car operating panel shall be furnished. It shall contain a bank of square mechanical illuminated buttons marked to correspond to the landings served, an emergency call button, door open and door close buttons, and switches for lights, inspection and the exhaust fan. The emergency call button shall be connected to a bell that serves as an emergency signal. All buttons to have both raised and Braille markings. LED (red) button illumination with 3 mm (1/8 in.) projecting target.

.2 Car Position Indicator: A 16-segment, digital, vacuum fluorescent car position indicator shall be integral to the car operating panel.

.3 Panel Design: Shall comply with requirements of the BC Building Code.

.4 Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime will sound.

.5 Hall Fixtures: Hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Raised markings shall be provided for each push-button. Hall fixture selections can be selected independently of car fixture selections. Fixture Finish: Satin stainless steel.

2.8 ACCESSORIES

.1 Protective pads: One complete set of fire retardant pads of quilted canvas duck for other than entrance walls.

.2 Pad Hooks: stainless steel pad hooks to walls except the entrance wall.

.3 Oil Hydraulic Silencer: Provide manufacturer's standard muffler device at power unit location.

.4 Vibration Pads: Mount under power unit assembly to isolate unit from building structure.

.5 Sound Insulating Panels: Provide reinforced 14 gage steel panels with 25 mm (1 in.) thick, 1-1/2 pound (0.68 Kg) fiberglass core attached to interior, mounted on all four sides of power unit frame.

.6 Sound Isolating Couplings: Provide a minimum of two couplings in oil line in machine room between pump and jack.

2.9 FINISHES - CAR ENCLOSURES / CAB INTERIORS

.1 General: Where stainless steel is specified it shall be No. 4 Finish.

.2 Cab Enclosures and Hoistway Entrances: Provide manufacturer's standard stainless steel car enclosures, and as follows, unless indicated otherwise.

.3 Cab Flooring: Homogenous composition 100% synthetic rubber, 3.17 mm thick. Acceptable product:

.1 Rounded round raised disk pattern, by Johnsonite, or approved alternative.

.2 Pattern and colour as selected by Consultant from manufacturer’s full range.

.4 Floor Base: Stainless steel sheet, 3 mm thick, No. 4 finish.

.5 Door Frames: Stainless Steel. Sound deaden doors and frame.

.6 Cab Doors: Stainless Steel.

.7 Cab front return, transom, soffit and strike-panels: Stainless Steel.

.8 Cab Walls: Horizontal grade standard plastic laminate self-edged panels, 1 mm thick minimum. Colour to be selected from manufacturer’s full range.

.9 Handrails: Minimum 38 mm (1-1/2 in.) diameter stainless steel handrails on non-access walls or other approved graspable design. Mount handrails at 810 mm (32 in.) above the finished floor and 38 mm (1-1/2 in.) clear of finished walls.

.10 Ceiling: Manufacturer’s standard plastic laminate, horizontal grade.

.11 Removable Panels: Fabricate cab walls of 16-gauge sheet steel painted with black powder paint and perforate for hardware to mount removable panels. Laminate to be selected by Consultant from the manufacturer's standard selection.

.12 Cab Lighting: Valance lighting complete with energy efficient fluorescent lighting with power factor corrected ballasts to provide ample and consistent lighting in all areas of the cab. Lighting level in elevators shall be 100 lux minimum measured at floor level.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Inspect hoistway, hoistway openings, pits and machine rooms. Verify critical dimensions. Examine supporting structures and conditions under which elevator work is to be installed. Do not proceed with elevator installation until unsatisfactory conditions have been corrected. Correct unsatisfactory conditions including dimensional discrepancies or other conditions detrimental to proper installation or performance of elevators.

.2 Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

3.2 INSTALLATION

.1 Install elevators in accordance with manufacturer’s instructions, reviewed Shop Drawings, and Code requirements. Install equipment, guides, controls, car and accessories in accordance with manufacturer installation methods and recommended practices.

.2 Properly locate guide rails and related supports at locations in accordance with manufacturer’s recommendations and approved shop drawings. Anchor to building structure using isolation system to minimize transmission of vibration to structure.

.3 Securely fasten hoistway frames to fixing angles mounted in hoistway. Coordinate installation of sills and frames with other trades.

.4 Lubricate operating system components in accordance with manufacturer recommendations

3.3 TESTING AND INSPECTIONS

.1 Perform recommended and required testing in accordance with Authority Having Jurisdiction.

.2 Obtain required permits and provide originals to Owner’s Representative.

3.4 DEMONSTRATION

.1 Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain elevators. Review emergency provisions and train Owner's personnel in procedures to follow in identifying sources of operational failures or malfunctions.

3.5 ADJUSTING, CLEANING, AND PROTECTION

.1 Adjust elevators for proper operation in accordance with manufacturer/installer's instructions. Adjust elevators for smooth acceleration and deceleration of car so not to cause passenger discomfort.

.2 Adjust doors to prevent opening of doors at landing on corridor side, unless car is at rest at that landing, or is in leveling zone and stopping at that landing.

.3 Adjust automatic floor leveling feature at each floor to within 6 mm (1/4 in.) of landing.

.4 Repair minor damages to finish in accordance with manufacturer/installer's instructions and as approved by Consultant.

.5 Remove and replace damaged components that cannot be successfully repaired as determined by Consultant.

.6 Clean elevators promptly after installation in accordance with manufacturer/installer's instructions.

.7 Do not use harsh cleaning materials or methods that could damage finish.

.8 Protect installed elevators from damage during construction in accordance with the negotiated temporary use agreement between Owner and manufacturer's installer

END OF SECTION