

1.0 **GENERAL**

1.1 **Related Work and UBC Guidelines**

- .1 [Section 10 00 10 Special Room Requirements](#)
- .2 [Division 26](#)
- .3 [Section 27 05 08 Cable Infrastructure Design Guidelines](#)

1.1 **Related External Documents**

- 1. [Latest edition of the British Columbia Building Code \(BCBC\)](#)
- 2. [Latest edition of the CSA B44 Safety Code for Elevators and the requirements of the BC Elevating Devices Safety Act and Regulation](#)

1.2 **Description**

- .1 UBC requirements for elevators. Items with **(Vancouver)** or **(Okanagan)** apply to the respective campus.

1.3 **Coordination**

- 1. [The Guidelines apply to all work completed within buildings on both UBC Vancouver and UBC Okanagan campuses unless stated otherwise.](#)
- 2. [In instances where conflicts are found between these guidelines and provincial regulations or codes, please notify the UBCV Technical Review Team Architect and UBCO Facilities Management.](#)
- 3. [These guidelines are intended to be read by design consultants and their content integrated into construction drawings and specifications. Construction documents are not to reference the technical guidelines directly.](#)
- 4. [The Coordinating Registered Professional \(CRP\) is required to coordinate these requirements with other disciplines.](#)
- 5. [The UBCV Facilities Technical Review Team or UBCO Facilities Management is to be contacted for assistance with coordination of the elevator review by UBC Facilities staff at the design development stage. UBC Facilities staff involved in the review would include at a minimum; UBC Building Operations Electrical, Accessible Buildings Planner and UBC IT.](#)

1.4 **Quality Control and Assurance**

- .1 [Submittals](#)
 - .1 [Shop Drawings](#)
 - .1 [O&M manual information shall be sufficiently detailed and shall include spare parts lists, drawings, adjustment procedures, testing procedures, diagnostic instructions troubleshooting procedures, diagnostic instructions, recommended spare part lists and the manufacturers recommended maintenance tasks and frequencies.](#)
 - .2 [Provide final reviewed shop drawings and Letter of Assurance in the O&M manual at project completion. Shop drawings to show general arrangement and layout of cabs and entrances.](#)

- .3 The supplier shall include all technical information required for performing maintenance of the equipment, including all diagnostic efforts made during construction to determine the cause of malfunction. Technical information shall include complete as-built electrical drawings, parts list, and instruction manuals as listed below.
 - .4 One additional copy of technical information [noted in item #3 above](#) shall be provided in PDF format.
 - .5 Two (2) copies of complete operating and maintenance manuals complete with up to date technical bulletins. O&M manual shall contain complete parts lists with exploded views of all assemblies. One digital copy is required.
 - .6 Three (3) copies One copy of complete adjusting, start-up, diagnostic and troubleshooting manuals and diagnostic codes. One digital copy is required.
 - .7 Three (3) copies of as built wiring diagrams. One digital copy is required.
 - .8 **(Vancouver)** Provide one (1) archive copy of the elevator contract data for purposes of reinstallation in the event the contract chip becomes corrupted and the data is lost. This is not intended to be a copy of the entire operating software of the elevator system.
- .2 Elevator Warranty
- .1 [Provide a one year \(12 months\) warranty from certified date of substantial performance of the Project.](#)
 - .2 Documentation requirements during the maintenance period:
 - .1 All maintenance including: regular inspections, adjustments, lubrications, call back for faulty operation, and the replacement of all parts and components which fail for any reason shall be documented by the elevator sub-contractor. This shall include parts replaced as part of warranty as well as parts to be replaced due to normal wear and tear.
 - .2 The elevator sub-contractor shall respond without extra charge to call backs on a 24 hour basis. However, all work other than call backs shall be done during regular working hours.
 - .3 The elevator sub-contractor shall provide a monthly summary of work performed for all service calls to UBC Facilities Electrical (Vancouver) / Facilities Management (Okanagan) for the entire maintenance (warranty) period.
 - .3 Validation of elevator performance during the maintenance period:
 - .1 An example of the permissible number of call backs and percent improvement required each year is indicated in the table below based on year 1 performance:

Number of Call Backs			Min. % Improvement Required Each Year
Year 1	Year 2	Year 3	
³ 10	8	² 4	33%
5 - 10	6	² 4	25%
4	4	² 4	0%

- .2 The elevator sub-contractor shall review the performance statistics in person prior to the expiration of the warranty period each year with UBC Facilities Electrical.
- .4 UBC Facilities Electrical at their discretion can put any new elevator equipment under the global maintenance contract for the campus or enter into an extended maintenance term with the original equipment manufacturer.
- .3 **Quality Assurance**
 - .1 Elevator Manufacturer and Equipment Requirements
 - .1 Contractor must be willing to fully comply with the non-proprietary requirements and demonstrate that technical support and parts can be made available to third parties.
 - .2 Controllers and other pieces of equipment to be non-proprietary. Controllers must come equipped with any special diagnostic tools, or any diagnostic software and connections available with a PC with manuals clearly defining the diagnostic codes and adjustment parameters.
 - .3 Any remote conduit and wiring required shall be the responsibility of the elevator trade contractor.
 - .2 **Elevator Consultant Qualifications**
 - .1 All elevators at UBC must be designed and approved by an Elevator Consulting Engineer as well as approved by UBC Facilities Electrical (Vancouver) / Facilities Management (Okanagan).
- .4 **Quality Control**
 - .1 Elevator consultant to carry out site reviews and submit a Letter of Assurance certifying that the elevators meet the requirements of CSA B44.
- .5 **Handover/Turn-Over**
 - .1 Prior to commencement of the warranty maintenance period, provide an orientation and demonstration session for the preventive maintenance, repair and trouble-shooting of the new equipment and control systems for UBC Facilities Electrical / Facilities Management elevator staff. Refer to CPG-01 (Vancouver).
 - .2 The orientation and demonstration shall be hands on at the elevator equipment and all drawings and manuals and the information contained in them shall be covered and verified at the site.

- .3 Provide a walkthrough session prior to completion of the warranty period as a handover.
- .4 A minimum of five (5) copies of each key used except keys specifically for maintenance and inspection personnel.

2.0 GENERAL MATERIAL AND DESIGN REQUIREMENTS

2.1 General Requirements

.1 Electrical

- .1 Elevators shall always be fed from a 600V source. 208V is only permitted if the main incoming feed for the building is at 208V.
- .2 Surge Protective Devices are required to be installed on any distribution containing elevator the elevator controller and motor.

2.2 Design Requirements for Passenger Elevators

.1 Elevator Type

- .1 Where the choice could be made for either hydraulic or traction, the decision should lean towards traction elevators. Where initial cost is the prime consideration, and the traffic demand will be light, and if there are no soil problems, then the hydraulic type may be considered.
- .2 For buildings with 2 or 3 stops, a twin post holeless hydraulic should be specified to eliminate the need for well hole drilling and eliminate the risks of buried cylinders. Telescopic plungers can be considered on a case by case basis but should be limited to three (3) stop elevators.
- .3 Roped hydraulic elevators shall not be considered.
- .4 Direct acting holed hydraulic elevator with buried cylinders will be considered only by prior written approval from UBC Facilities Electrical.
- .5 For buildings with 4 to 12 elevator stops, use high efficiency, environmentally-friendly gearless traction elevators or conventional geared or gearless traction elevator equipment.
- .6 For buildings exceeding 12 elevator stops, generally use gearless traction elevator, with machine room located overhead.
- .7 Lifts for persons with disabilities, handicapped lifts or Limited Use Limited Application (LULA) lifts shall not be acceptable as passenger elevators as directed by the B44 Safety Code for Elevators and the Elevating Devices Safety Regulation.

.2 Size of Elevators

- .1 Passenger elevators shall have a minimum capacity of 1135 kg for basic single unit applications unless building requirements mandate a larger platform size. Larger buildings with more than one elevator shall typically use 1360 kg to 1820 kg platform sizes based on the demand and other building requirements. Elevator sizes shall be

chosen from typical North American manufacturer's standard sizes unless the needs of the building dictate the use of non-standard sizes. Elevators shall be of adequate size and loading class to transport equipment required for building/department operation and maintenance.

.3 Location of Elevators

- .1 Elevators should be located centrally in the building or where the walking distance to any point on the floor plate does not exceed a maximum of 45 m. Where the location of the elevator(s) exceeds 45 m from any point in the building then separate elevator service should be provided in distributed segments of the building where the walking distance from any point in the building to the elevator(s) does not exceed 45 m.
- .2 All elevator landings shall be located in conditioned lobbies

.4 Number of Elevators

- .1 For buildings with 3 or less elevator stops, and a gross area of less than 5,000 m², provide two elevators.
- .2 For buildings with 4 or more elevator stops, use traction type elevators. If the gross area exceeds approximately 6000 m² provide a group of two elevators. If the gross area of the building exceeds 10,000 m² provide a group of three elevators.

Note - The quantity of elevators should be selected based on providing a % of handling capacity based on the gross building population rather than square footage. Likewise, a requirement for a maximum waiting time should be considered. The "waiting" time is measured in a dimension called an "interval" that is measured in seconds. These vary for building type and usage, for instance a busy classroom or office block the handling capacity should be 10-12% of the building population in a five minute interval and the interval should not exceed 35 seconds. A residential building should have a handling capacity of 5-7% of the building population and a maximum interval of 40 seconds.

- .3 If distributed elevator configurations are used then the total number of elevators required shall be increased by approximately 65% to account for the inefficiencies of the distributed arrangement and imbalances in demand.

.5 Speed of Elevator

- .1 The speed of the elevator shall be within the following ranges and chosen to suit the specific building requirements;
- .2 Hydraulic passenger elevators to be 0.5 to 0.75 m/s.
- .3 Geared or High Efficiency Gearless traction passenger elevators to be 1.5 to 2.0 m/s.
- .4 Gearless elevators to be 2.5 m/s and greater.

.6 Door Type and Size

- .1 At least one (1) elevator must meet the BC Building Code requirements to be able to carry a stretcher (or gurney) in the prone position. It is generally accepted that a 1135 kg elevator with 1066 (42") wide side-opening doors meets this criteria.

- .2 Where traffic demand is expected to be light, the "stretcher" elevator (in US English = a Gurney) can have a single speed side-opening door, in which case a standard 1,135 Kg passenger elevator meeting the stretcher requirements is adequate.
 - .3 Where there is already an elevator which can accommodate a stretcher the remaining passenger elevator(s) in the building should be provided with centre-opening doors for efficiency.
 - .4 Front and rear door arrangements should be avoided, and used only where the design of the building makes any other solutions impossible. Where there are "staggered" floor levels which have to be served by an elevator, then rear doors are unavoidable.
- .7 Elevator Machine Rooms and Closets**
- .1 Elevator machine rooms and closets shall be designed to have adequate space to safely maintain and replace any and all equipment safely. The ability for a worker to access ceiling mounted equipment from a step-ladder is required. No equipment, other than what is required by applicable codes and standards shall be installed in an elevator Machine Room or Closet. No equipment shall be mounted above 2 m unless required by applicable codes or standards.
 - .2 [Traction elevators](#): the machine room shall be located directly overhead unless a variance is requested. [Machine Room Less elevators are not accepted](#).

2.3 Design Requirements for Freight and Service Elevators

.1 Elevator Type and Class

- .1 Elevators required specifically for freight and freight handlers only shall be designated as true freight elevators. Where a combination of freight and passenger use is required the elevator shall be designated as a passenger elevator but shall be designed with the freight use in mind to provide a service type elevator.
- .2 Provide Class C3 loading where single piece or large concentrated loads must be moved which will exceed 25% of the rated capacity of the elevator (but will not exceed the rated capacity of the elevator). Provide Class C1 or C2 loading as appropriate where the elevator is required to be loaded or unloaded by an industrial truck.
- .3 The use of freight platform lifts or material lifts as defined in the B44 Safety Code for Elevators shall not be acceptable unless very special conditions exist to justify these restricted use configurations.

.2 Number of Elevators

- .1 Where a freight elevator is required, generally one (1) will be adequate except where demand may require more.

.3 Size of Elevators

- .1 Freight and Service elevators shall be sized to suit the largest object which has to be moved and the capacity rating shall be appropriate for the anticipated needs. Elevator sizes shall be chosen from typical North American manufacturer's standard sizes unless the needs of the building dictate the use of non-standard sizes.

.4 Speed of Elevator

- .1 The speed of the elevator shall be within the following ranges and chosen to suit the specific building requirements; Service elevators shall be treated as passenger elevators for determination of speed and other criteria.
- .2 Hydraulic freight elevators 0.3 to 0.5 m/s.
- .3 Geared traction freight elevator up to 2000 Kg 1.0 to 0.5 m/s – 1.75 m/s (i.e. 100 – 350 fpm).
- .4 Geared traction freight elevator > 2000 kg. 0.5 m/s – 1.0 m/s.

.5 Type of Doors

- .1 For Service (Passenger) elevators provide power operated horizontally sliding passenger doors. The use of two (2) speed side-opening or two (2) speed centre-opening doors may be utilized to provide a wider opening to suit the anticipated needs. The use of three (3) speed doors or other special arrangements such as swing doors is not acceptable unless very special conditions exist to justify these more unusual arrangements.
- .2 Vertical sliding bi-parting doors shall only be used on true freight elevators where no passenger use is required and where a maximum of opening width is required. Vertical sliding bi-parting doors shall be power operated.

.6 Size of Doors

- .1 Standard door width for horizontally sliding Service (Passenger) elevator doors is 1070 mm, although larger sizes are available. Where possible doors shall be chosen from sizes in 150 mm increments. A standard door height of 2135 mm should be used unless higher doors are required in which case 2440 mm high doors should be chosen.
- .2 The minimum width for vertical sliding bi-parting doors should be 1830 mm and larger doors shall be chosen from 610 mm increments where possible to stay within typical standards.

.7 Manufactured Equipment

- .1 All components used in the installation of new elevators, or the modernization of existing elevator systems, shall have an established reliability record of at least 3 years.

3.0 MATERIALS AND SPECIFIC MECHANICAL/ELECTRICAL REQUIREMENTS

3.1 Requirements for All Elevator Types

Provide Seismic Safety Features in compliance with the latest version of the B44 Elevator Safety Code.

.1 Car Top Guard Rail.

- .1 Provide a car top guard rail that meets the requirements of the code and the following requirements:
 - .1 The guardrails shall not defeat any isolation between the car frame and the car cab. The preferred installation is to have the guard rail tied to the cross head.

.2 Allowance for Additional Weight

- .1 The complete elevator including the drive, support and counterweight shall be designed such that the weight of the basic cab can be increased with additional finishes or other additional equipment totaling not more than 350 Kg per cab.

.3 Guides

- .1 Provide roller guides consisting of polyurethane tired wheels, at least 150 mm diameter for the car guides and 75 mm diameter for counterweight guides where applicable for all passenger elevators. Guides on freight elevators shall consist of solid slippers or sliding guide shoes.

.4 Travelling Cable

- .1 Provide spare conductors in the travelling cables and communication wiring as follows; Provide spare wiring consisting of the greater of a minimum of 10% or ten (10) individual conductors and provide a minimum of eight (8) twisted shielded pairs of 20

AWG communication conductors for other equipment which maybe provided, over and above any pairs required by the elevator control system.

.5 Door Operators

- .1 Automatic car door operators shall be of the heavy duty, high performance type designed for high performance and long life. Light or medium duty door operators are not acceptable.
- .2 All door operators shall be provided with closed loop feedback operators capable of adjusting the closing torque to suit changing building conditions.
- .3 Where front and rear doors are used provide full selective control of the door operation.

.6 Car Operating Panel

- .1 Where centre-opening doors are provided, the elevator cab shall have two car operating panels, one on each side of the cab. Where front and rear doors are used the elevator cab shall have two car operating panels, one on the front side and one on the rear side of the cab. Where space permits, car operating panels shall be mounted on the door return panels, otherwise shall be on the side walls adjacent to the door return panel.
- .2 In-car stop switches shall be key-operated.
- .3 Car operating panels with angled buttons designed to be universally accessible for use by both standing and seated persons are encouraged.
- .4 Where possible mount the car call buttons in a single vertical column.
- .5 Provide the following keyed switches and related features for each elevator; Light Switch, Fan Switch, Independent Service Operation Switch, Inspection Switch, Emergency Light Test Switch. Provide two (2) cutouts per panel with blank inserts for the future addition of other keyed switches. Any elevator equipped with Phase I Emergency Recall shall also be equipped with Phase II In-Car Emergency Service Operation and the related keyed switch.
- .6 Buttons shall be of the vandal resistant type. Approved products are Dupar US84, 90 or 91 available from Dupar Controls. Car Tactile markings shall be Dupar US89, California Style white on black. All devices shall be mounted and secured to endure minor acts of vandalism. Approved keying shall be Dupar standard. Push buttons from the manufacturers standard range of products shall also be considered providing that spare parts are easily attainable, they are of a vandal resistant design and meet the performance requirements of these guidelines or approved equivalent.
- .7 A separate telephone activation button shall be provided. See details under Voice Communication of this Technical guideline (5.6).
- .8 All illuminating devices shall be provided with long life LED illumination which is clearly visible in the ambient lighting level of the cab.
- .9 The panel face plate shall be professionally engraved to identify each component, the position of switches, the elevator capacity, the owner's identification number as well as any jurisdictional identification numbers applicable to the installation.

- .7 Hall Buttons
 - .1 The lights shall be from a long-life LED source.
 - .2 Hall button face plates shall be engraved to include the required message to not use the elevator in case of fire.
- .8 Hall Lanterns
 - .1 Where there are two or more elevators in a group, there shall be hall lanterns at all entrances.
 - .2 Lanterns shall be of the vandal resistant type and shall be located above or adjacent to the entrance. The illuminating elements shall be LED with a minimum usage rating of 100,000 hours. An electronic chime shall be provided which will sound when the lantern illuminates. The audible signal shall be a soft "chime" type sound, with adjustable intensity not less than 24 DBA. Harsh electronic beepers are not acceptable, and the type of chime is subject to owner approval. Sound the gong once for Up Bound, twice for Down Bound.
- .9 In-Car Lanterns
 - .1 Where a single elevator is being provided, it shall have an in-car direction lantern on each car door post.
 - .2 Where there are front and back entrances, there shall be such a pair of lanterns on each entrance, and it will operate in unison with the corresponding entrance. The illuminating elements shall be LED with a minimum usage rating of 100,000 hours.
- .10 Voice Announcer
 - .1 Provide equipment to allow an audible announcement in each elevator cab. The messages shall be appropriate to reflect the conditions pertinent to the elevator and shall be subject to the owner's approval.
 - .2 Connect the equipment to the elevator control system and determine the necessary inputs so that the messages reflect the conditions pertaining to the respective elevator or group function.
 - .3 Mount the remote speaker in the car operating panel behind a protective grille. Ensure that the location of the speaker will allow the announcements to be clearly audible both in the car and in the adjacent hallway when the elevator doors are open. The system shall be equipped with site adjustable volume control.
 - .4 As a minimum the system shall include, but is not restricted to the following announcements:
 - .1 Announcement of the floor designation that the elevator is about to stop at.
 - .2 Announcement of the direction of travel of the elevator. The announcement shall be made when opening the doors in response to car or hall calls.
 - .3 An announcement warning to stay clear of the doors if the car door nudging feature is activated.
 - .4 An announcement warning that the elevator has been recalled to the ground floor as a result of emergency recall or other similar feature.

- .5 The equipment provided shall be flexible and shall permit site programming so that the messages may be changed at any time to suit changing conditions in the building. All announcements shall be available in either English or both English and French. The voice shall be male or female as selected by UBC.
- .6 The system shall have adequate capacity to store up to 40 different announcements and a total of 4 minutes of recording, as a minimum.
- .7 Audible signals should still be provided in hall lanterns.
- .11 Position Indicators
 - .1 In addition to the car position indicator required for Barrier Free Access each elevator shall be provided with a digital position indicator over the main floor entrance. Position indicators shall be LED or Vacuum Fluorescent type dot matrix or digital segment displays with characters at least 35 mm high.
- .12 Emergency Cab Light
 - .1 A battery powered emergency cab light device shall be provided for each elevator. The illumination source shall be an integral part of the car operating panel or as a separate inconspicuous fixture.
- .13 Firefighters Emergency Operation
 - .1 The fire alarm system shall have an "elevator bypass" system provided to allow the fire alarm system to be tested without disrupting elevator service.
- .14 Group Operation
 - .1 Where two or more elevators are operating in a group, the operation shall be a group supervisory system, providing automatic collective control for each elevator and a group dispatching and hall call allocation system.
- .15 Control Equipment
 - .1 The control equipment will be primarily solid state, micro processor based.
 - .2 All elevator controllers shall be equipped with easily accessible trip counters that will increment once for each elevator trip (not re-levelling or door cycling). Counters may be discrete counters that are accessible by on board diagnostic tools.
 - .3 Control systems shall include non-proprietary diagnostic systems. Where special diagnostic tools are required these must be provided with the equipment along with appropriate instructional manual and documents. Any such tools and supporting documentation shall become the property of UBC.
- .16 Provisions for Card Readers
 - .1 All elevator controllers should come equipped with a specially wired terminal strip so that an external card reader system can easily be added. The terminal shall have a pair of terminals for each car call other than the ground floor, such that if the terminals are 'jumped' the car call will operate, if not 'jumped' the car call cannot be registered. The control shall be arranged so that if an elevator is operating as a fire fighter elevator this security feature is overridden.

- .2 Travelling cables with adequate conductors to provide signals from the elevator card reader in the cab shall be provided. As a minimum this shall be three (3) spare shielded pairs.
- .17 Independent Service Operation
 - .1 There shall be independent service operation on each elevator. This will be initiated by a keyed switch in the car.
- .18 Inspection Operation
 - .1 Each car shall be equipped with an inspection switch to remove the car from service and prevent operation from any means other than the inspection operation manual controls.
- .19 Hoist way Access Operation
 - .1 A hoist way access keyed switch and operation shall be provided for each elevator at the top and bottom landings landing for access to the elevator car top regardless of the floor to floor height or speed of elevator. Keys must be submitted for UBC's maintenance personnel.
- .20 Electrical Requirements
 - .1 Elevators shall always be fed from a 600V source. 208V is only permitted if the main incoming feed for the building is at 208V.
 - .2 Surge Protective Devices are required to be installed on any distribution containing elevator the elevator controller and motor.
- .21 Emergency Power Operation
 - .1 Where standby power is provided, provide two (2) separate signals. One (1) pair to advise that the elevators are on standby power and the second pair to advise of the imminent transfer of standby power or back to normal power. The purpose of this signal is to allow the elevator to park only until power is transferred. Upon transfer to emergency power, the elevators shall resume normal operation.
 - .2 When emergency power operation is provided include, as part of the control system, suitable circuitry to shut down a moving car at the next possible floor when an advanced warning contact opens. The advanced warning contact will be supplied by the owner and will open 20 seconds prior to the activation of the transfer switch.
 - .3 The operation and proper operation of the test procedures, including the proper operation of the advanced warning signals shall be tested by the elevator contractor, the generator contractor and a written report and operation instructions shall be provided prior to occupancy.

3.2 Requirements for Hydraulic Elevators

- .1 Tank Heater

- .1 A thermo statically controlled tank heater to maintain the oil at a constant minimum operating temperature is required. Alternatively a viscosity control feature is also acceptable.
- .2 Oil Level Indicator
 - .1 An outside oil level indicator is required to determine the oil level without removing the reservoir cover.
- .3 Gate Valves
 - .1 A tank shut-off valve or gate valve is required in both the machine room and the pit.
- .4 Motor Soft Start
 - .1 An electronic motor soft-start device is required and must be fully adjustable to limit the peak starting current to as little as 150% of the full load running current.
- .5 Duty Rating
 - .1 All hydraulic elevator components including motor, pump, valve, piping and muffler shall be designed for a minimum duty of 80 up starts per hour.
 - .2 Provide Seismic Safety Features in accordance with the latest version of the B44 Elevator Safety Code, for pipe rupture valves, pre-Approved products are Maxton OSVB44
- .6 Sound Isolation
 - .1 Hydraulic elevators shall be equipped with sound isolation between the oil reservoir and the floor in the form of a sound-isolation based rubber mat.

3.3 Requirements for Traction Elevators

- .1 Sound Isolation
 - .1 Traction machines must be mounted on sound isolating pads, isolated in all directions.
- .2 Car Balancing
 - .1 With car empty and doors closed, remove the upper car guides. Add suitable weights to the car so that it hangs plumb in this condition. Then adjust the counter weight so that the car and counter weight are in balance with a load in the car which is between 42% and 44% of the rated load.
- .3 Motor & Drive
 - .1 Provide high efficiency permanent magnet AC motors with matching variable frequency/ variable voltage drive system of the flux vector type. Control and drive systems shall be closed loop which include position and velocity feedback devices to regulate the speed of the elevator within +/-2% of contract speed with any load from empty to rated capacity.
 - .2 There shall be an isolation transformer between the power and the elevator drive system. The total harmonic and individual harmonic distortion shall not exceed 5%

and 3% respectively and the requirements of IEEE-519 shall be adhered to with respect to power harmonics. For purposes of measurement the Point of Common Coupling (PCC) shall be defined as the elevator power supply terminals located in the elevator machine room.

- .3 For geared and gearless elevators provide a full re-generative drive system to return power generated during dynamic braking or running with over hauling loads to the power supply lines.

- .4 Automatic Rope Lubricators

- .1 Provide automatic rope lubricators which consist of natural fiber pads connected to a lubricant reservoir. The devices shall be mounted adjacent to the hoist ropes in a manner that allows them to be adjusted to contact the ropes when desired.

3.4 Finishes

- .1 Elevator finishes shall be selected from the list below. Provide a variance request for approval by the UBC Facilities Technical Review Team for variations to the finishes..
- .2 Where glass is used in or as part of cab enclosures, it must be laminated safety glass.
- .3 Finishes for Passenger and Service Elevators
 - .1 Landing door panels and entrance frames to have plain white prime coat paint finish.
 - .2 Hall operating and signal fixtures to be stainless steel brushed finish.
 - .3 Car operating and signal fixtures to be stainless steel brushed finish.
 - .4 Car door panels to be stainless steel brushed finish.
 - .5 Cab front and/or rear return panels, door jambs and header/lintel to be stainless steel brushed finish.
 - .6 Cab ceiling to be 14 gauge factory baked enamel finish or other durable finishes..
 - .7 Cab lighting to be energy efficient fluorescent lighting, consisting of T8 lamps and electronic ballasts.
 - .8 LED illumination make LED recessed pot lights a power smart option.
 - .9 Cab walls to be raised, horizontal, removable plastic laminated panels above the cab handrail. Raised stainless steel brushed #4 finish removable panels below the cab handrail. Plastic laminate or stainless steel panel reveals.
 - .10 Cab kick plate/ base plate to be stainless steel #4 brushed finish.
- .4 Finishes for Passenger Elevators Only
 - .1 Suspended ceiling and lighting coves – suspended ceiling types to be durable and easily accessible for maintenance. Lighting coves to be on the cab side walls with factory baked enamel finish.
 - .2 Preferred cab finished flooring to be linoleum flooring.. Where moisture is anticipated, flooring shall be resilient sheet vinyl flooring. Porcelain or ceramic tiled flooring is not acceptable.
 - .3 Cab handrails to be standard 1½" tubular stainless steel handrails on all non-access walls.
 - .4 **(Vancouver)** Finishes for passenger elevators to be reviewed by the UBC Accessible Buildings Planner.

.5 Finishes for Service Elevators Only

- .1 Suspended ceiling/lighting coves -suspended ceiling type to be durable and easily accessible for maintenance. Lighting coves to be two (2) light coves on the cab side walls with factory baked enamel finish.
- .2 Cab finished flooring to be steel checker plate.
- .3 Cab handrails to be 4" high flat bar stainless steel.

.6 Finishes for Freight Elevators

- .1 Freight elevators shall be equipped with steel checker plate floors and painted metal cab and entrance finishes.
- .2 Cab finishes including cab walls, doors or gates, ceiling, etc. shall be finished in a factory applied powder coat or baked enamel finish.. Entrance components including frames, headers and landing door panels shall be finished in a factory applied prime coat finish suitable for finished painting by others.
- .3 Lighting for freight elevators to consist of recessed fluorescent light fixtures.
- .4 Provide bumper rails to prevent damage to cab walls from pallet jacks etc.

3.5 Rails

- .1 Standard size "T" section car and counterweight guide rails, with tongue and groove joints, together with suitable splice plates at the connections are required. As a minimum use 22 Kg/m rails for the car.

3.6 Voice Communications

- .1 For each elevator, provide a hands-free emergency voice communication system and mount as a separate fixture or as an integral part of the car operating panel. Provide a telephone system for communications to be monitored by UBC Security via an auto dialer.

(Vancouver) Provide a telephone for mounting behind the car operating panel faceplate. Make all connections required to activate the communication device with the wiring provided. Program the device to dial the number(s) provided by the Owner. A separate telephone activation button shall be provided. This button shall be provided with a tactile and Braille marking displaying the international symbol for a telephone.

(Okanagan) All elevator Emergency phones are monitored by security and must dial 78111. Each elevator emergency phone shall have a dedicated cable run to the building communication room and terminated as specified in Division 27 of the Technical guidelines.

- .2 The telephones shall be non-proprietary third party phone systems that can be easily adjusted, reprogrammed, volume adjusted or other features easily adjusted.
- .3 **(Vancouver)** The auto dial number to be programmed in all elevator cars for UBC Point Grey campus ([except for SHCS Buildings](#)) is 604-822-0445.

- .4 UBC Information Technology (IT) requires a demarcation point for each telephone line installed for elevator use. This demarcation is typically located in the elevator machine room. It allows UBC IT to test the phone line without entering the elevator equipment.
- .5 The elevator contractor shall test the operation of the communication system from each elevator cab to a Lobby Station (when provided) and to UBC Security. Provide UBC Facilities Electrical (Vancouver) / Facilities Management (Okanagan) with a report containing the total time from in cab activation until UBC Security could both identify the cab and communicate with the person in the cab.

3.7 Door Protection

- .1 Door re-opening devices shall be of the multi-beam infrared light detector type designed to detect obstructions without contact. Approved products are Janus - Panaforty, Formula Systems - Safe screen 547 and Otis - Lambda.

3.8 Hall Tactile Markings

- .1 Provide quality embossed metal jamb plate markings. Provide EJ3 markings with WB Finish and four-hole mechanical mounting available from Stencil Cutting and Supply Company, Ph. 1-800-783-4633 or approved equivalent product. Markings shall be attached with pins or other mechanical means. Do not use stamped or etched plates, and do not use only adhesive for attaching.

4.0 LESSONS LEARNED AND COMMON MISSES ON UBC PROJECTS

Items in this section are lessons learned or misses from past projects. These may also include code or industry best practices. If not applicable to a project, a variance is not required.

- .1 Some buildings do not have service/freight elevator and passenger elevators are used for deliveries. Heavy load deliveries damages porcelain/ceramic tiled flooring. This flooring type is not be used for any elevator type.

END OF SECTION