Vancouver Coastal Health Facilities Management

Elevator Technical Guidelines and Requirements

Division 14 – Vertical Transportation

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Revision	Description	Date
0	First Draft check for formatting and overall direction.	April 16, 2014
1	Add Elevator Selection Criteria, Create Six (6) Separate Sections	July 3, 2014
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DEFINITIONS AND ACRONYMS

Term	Acronym	Definition
Best Practices	-	The preferred solution for Health Care Facilities between discretionary options.
British Columbia Safety Authority	TSBC	The Authority having jurisdiction over elevators in the Province of British Columbia.
Elevator Modernization	-	The elevator is deemed to be modernized when a majority of the parts have been replaced with new parts. This should include the motor, machine, controller, and the door operator.
Health Authority	HA	British Columbia Health Authority, primarily referring to Vancouver Coastal Health in this document
Handling capacity	-	Handling capacity refers to the number of passengers that are transported by the elevator for a certain period of time)
Health Care Facility	HCF	A building operated by personnel involved with providing health care for people, including but not limited to Acute Care Hospitals, Residential care homes, specialty care centres, and administration offices
Intellectual Property	IP	This is a legal term that refers to creations of the mind. Examples of intellectual property include music, literature, and other artistic works; discoveries and inventions; and words, phrases, symbols, and designs.
Interval	-	The average time between elevator departures from the ground floor during a peak period.
Keys	-	Where the term “key” is used in this document, this refers to keys directly related to the function of the elevators and are in the form of barrel keys, flat keys, or other arrangements
Medical Emergency Operation	MEO	Medical Emergency Operation (previously referred to as “Code Blue”) is a priority elevator operation mode that allows medical staff to call an elevator to their location as a priority, over-riding all other elevator calls made. It allows medical staff to obtain and retain control of an elevator to move a patient/equipment in an urgent manner.
Medical Emergency Operation Stage 1	MEO Stage 1	The operation where an elevator is recalled directly to a specific level as requested by HCF Staff

Term	Acronym	Definition
Medical Emergency Operation Stage 2	MEO Stage 2	The operation of the elevator after MEO has been initiated from within the cab. This is considered a form of “attendant” operation as defined by the B44 Safety Code for Elevators
Non-Proprietary	-	Non-proprietary shall refer to all elevator systems and equipment meeting established standards for Universal Serviceability and Maintainability. Refer to Part 1 - Section 4 Non-Proprietary Equipment for further detail.
Original Equipment Manufacturer	OEM	Original Equipment Manufacturer
Operations and Maintenance Manual	O&M Manual	An O&M Manual contains all information that a technician requires to install, operate and maintain the equipment provided.
Priority Service Operation	PSO	An elevator operation that dispatches an elevator for staff use such that the elevator will arrive to the landing as an empty cab.
Restricted Access	-	An elevator operation that restricts access to the elevator and/or certain floors that the elevator serves.
Standards	-	The minimum requirement of these guidelines
Vancouver Coastal Health	VCH	Vancouver Coastal Health is a Provincial Health Services Authority. The Manager, Contracts and Optimization for Vancouver Coastal Health manages the Elevator Program.

PART 1 – GENERAL REQUIREMENTS

1 INTRODUCTION

1.1 These Technical Guidelines (the “guidelines”) are provided to project and operational maintenance delivery teams - including but not limited to design consultants, facility managers, project managers, project directors, contract managers hospital staff, and other stakeholders – as the basis for “Division 14 – Vertical Transportation” specifications for new elevators in new and existing facilities, and for modernization of existing elevators in existing facilities. A Division 14 specification shall be provided for each HA Project that includes an elevator, for review and approval by Manager, Contracts and Optimization. Deviations from the Technical Guidelines and Requirements require acceptance by Manager, Contracts and Optimization and VCH stakeholders.

1.2 It is the responsibility of the consultant responsible for authoring the specification for each Project to address any questions or concerns arising from these guidelines, including but not limited to conflicts between these guidelines and regulatory requirements, best practices and/or professional disagreement. The HA is not responsible for errors in specification produced for Projects. Deviations from the Guidelines shall be presented in a simple format spreadsheet as per Appendix

1.3 Elevators are the primary means used for vertical movement in HCFs and are expected to transport of patients, staff, visitors, animals, and materials in a safe, reliable, effective, and responsible manner. The intent of the guidelines, as appropriate to each Healthcare Facility (“HCF”) in the HA portfolio, is to:

.1 Establish the highest level of elevator service, maintenance, repair and upgrade achievable and appropriate to each HCF;
.2 Provide consistency of operational features including but not limited to features such as Medical Emergency Operation (“MEO”, previously referred to as Code Blue) and Infection Control standards;
.3 Provide standard interfaces between elevator control equipment and HCF signals.
.4 Provide design considerations, performance expectations, operational features, and equipment characteristics for elevators.

1.4 The guidelines are considered to be best practice and are mandatory unless otherwise indicated. HA’s expect these guidelines to be followed unless justification for non-compliance is provided and accepted by the Manager, Contracts and Optimization. Final specifications, including any deviations from these guidelines, require written approval from the Manager, Contracts and Optimization for each project prior to the procurement of contractors.

1.5 These guidelines cover the following types of equipment:

.1 Passenger Elevators (including service elevators in a variety of usages)
.2 Freight Elevators
.3 Dumb waiters
.4 Lifts for Persons with Physical Disabilities (B355 Handicap Lifts)
.5 LULA (Limited Use Limited Application Lifts)

1.6 The guidelines are subject to revision due to changes including but not limited to changing technology, safety code requirements, infection control standards and/or other best practices that are deemed suitable for inclusion at any time.

1.7 The guidelines are based on facility experiences and lessons learned, all specific to HCFs.

2 CODES AND STANDARDS

All codes and standards shall be the latest edition for the project location.

2.1 Applicable codes and standards shall include but are not limited to the following and in every case the latest adopted version shall apply:

.1 A17.1/B44 Safety Code for Elevators
.2 B355 Lifts for Persons with Physical Disabilities
.3 CSA Z8000 - Canadian Health Care Facilities - Planning, Design and Construction section 12.2.6 – Elevators
.4 BC Building Code
.5 Vancouver Building By-Law
.6 Canadian Electrical Code
.7 CSA Z317.13 - Infection control during construction, renovation and maintenance of Healthcare Facilities
.8 Fire Code
.9 Safety Orders, Directives and Information Bulletins as published by the BC Safety Authority

3 STANDARD KEYING

3.1 The following keys shall be used as standard for elevator functions. Keys shall be provided with bow covers colour or anodized colour coded to their function on the respective key switches. Key switches shall have a matching colour coded ring. Review with Contract Manager, Facilities, FMO and project team for items that do not have designated colours TBD :

.1 Fire Fighter Operation:	FEO-K1	Red
.2 Standby Power Operation:	FEO-K1	Red
.3 Medical Emergency (formerly Code Blue):	X4004	Blue
.4 Independent (Porter/Cleaner) Service:	X4001	Green
.5 Service Panel Covers:	X4001	Green
.6 In Cab Lights:	X4001 (6)	Green
.7 Access Enable Restricted to Elevator technicians only	X4002	No colour used.
.8 Hoistway Access Restricted to Elevator technicians only	X4002	No colour used.
.9 Priority Service OperationMedical Staff	X4005	Yellow
.10 Restricted Access – Medical Staff	X4006	TBD
.11 Restricted Access - Facilities Staff	X4007	TBD
.12 Reserved for Other Restricted Access	X4008	TBD

.13	Security Override	X4009	TBD
.14	Special Feature (Run/Stop Key Switch COP	X4010	Black
.15	Emergency Communications Failure	X4011	TBD
.16	Special Feature	X4012	TBD

4 NON-PROPRIETARY EQUIPMENT

4.1 Non-proprietary shall refer to all elevator systems and equipment meeting established standards for Universal Serviceability and Maintainability.

These standards shall include but are not limited to the following elements:

.1 Parts and equipment can be purchased, installed and maintained by any qualified elevator maintenance provider, as certified by the TSBC at a reasonable cost.
.2 Repairs, upgrades, parts integration, replacement, diagnostic and programming information, tooling at sale (or upon request), technical support and training where required to support the products shall be readily available for the life of the product not less than 25 years.
.3 Control systems shall include diagnostic tool functions on-board that such maintenance, adjustment and troubleshooting device or system provides unrestricted access to all parameters, levels of adjustment, and provides alerts for necessary maintenance of the equipment.
.4 A proprietary tool shall not be required for any reason. Any lost or damaged tool may be promptly replaced or repaired at reasonable market cost.
.5 Manuals, engineering drawings, circuit diagrams and prints shall be provided with the equipment at time of delivery. All documentation shall be available for replacement purchase, at reasonable cost, by any installing or maintaining elevator contractor or persons so designated by the building owner.
.6 Software or software keys shall not expire.
.7 Software operation shall not degrade and all service updates to the original software shall be provided by the control manufacturer free of charge to the end user for the life of the product not less than 25 years.
.8 The control manufacturer shall provide direct support and diagnostic information to the "end user" and their designated maintenance company. Factory and/or on-site training regarding installation, adjustment, maintenance and troubleshooting the equipment shall be available from the original equipment manufacturer for the life of the product not less than 25 years. Training fees shall be reasonable and appropriate to the market.

5 ELEVATOR CONTROLLERS AND OUTSIDE SIGNALS INTERFACE

5.1 Each elevator controller shall be equipped with an interface panel, separate from the elevator controller, to provide connection points for both inputs from various building systems including but not limited to security, building automation systems, backup power, and automatic emergency recall operation.

5.2 The interface panel shall be a minimum of an 18” x 18”’ box with adequate terminal blocks for the amount of inputs and outputs between the elevator controller and the signals being provided.

PART 2 – TECHNICAL REQUIREMENTS

6 INTRODUCTION

6.1 Part 2 of these guidelines is intended to provide consistent technical processes across all HCFs.

7 BARRIER FREE ACCESS

7.1 All elevators shall meet requirements of the latest edition of the B44-16 Safety Code for Elevators for barrier free access.

7.2 Additional requirements to the information specified in the Appendices of B44-16 (per applicable clause) shall be provided at facilities identified as requiring greater access, including but not limited to residential care facilities, specialty HCFs (i.e. GF Strong and Blusson), or providing services to Clients with limited mobility security requirements.

7.3 All elevators shall be equipped with the required functionality to restrict access. The inputs for security shall be separate from the cab (or hall) inputs.

7.4 An interface between the elevator controller and the security system shall be provided to facilitate isolation of the systems from one another for testing purposes.

7.5 Elevator software shall be programmed to ensure Fire Service Phase II shall override any call restrictions.

8 SECURITY

8.1 Secutiry requirements are to be assessed on a case by case basis for Healthcare Facilities and approved by the HA, FMO and IPS.

9 ELEVATOR PERFORMANCE

9.1 Elevator performance shall be based on industry standards with respect to speed, levelling accuracy and door operation times. At a minimum, performance specifications shall meet all relevant code requirements and any additional site specific requirements, including per Appendices to this document.

9.2 Elevator performance criteria shall be considered when evaluating, calculating and specifying the quantity, speed, and capacity of the elevators in each HCF. Elevator performance shall meet or exceed the intended specific requirements of each HCF.

9.3 Door Hold/Re-Open Process

If an obstruction is encountered that prevents the elevator door from closing, the following process shall occur:

.1 The door shall stop and re-open. The elevator nudging sequence shall commence as follows:

a) Doors shall close at reduced speed and energy (in accordance with the B44 Safety Code for Elevators).
b) If the doors cannot close, they shall re-open and wait for 30 seconds before attempting to close again.
c) The elevator shall cycle through this sequence three (3) times before removing itself from service.
d) After a five (5) minute interval has elapsed, the elevator shall re-start the sequence.
e) If after three (3) complete cycles the doors fail to close, the elevator shall be removed from group operation.
f) If the elevator is equipped with remote monitoring, it shall be programmed to alert the Elevator maintenance provider, and/or a facility designates(s), of the issue.
g) The cab operating panel information display screen shall be programmed to inform the public of the issues as it cycles though the program cycles noted in this clause.

.2 MEO and PSO shall have the ability to override the nudging sequence at any time.

10 PERFORMANCE REPORTING

10.1 One (1) eight (8)-digit electromechanical trip counter shall be provided in each elevator controller. It shall be programmed such that the number will advance for each trip the elevator makes and will not advance for door re-opening.

10.2 Recording of elevator faults and events shall be included as part of the elevator control system.

10.3 If the elevator is equipped with remote monitoring, it shall be programmed to alert facility designate(s), of any faults that arise for each elevator.

11 RIDE QUALITY

11.1 Horizontal and vertical acceleration within the cab during all ride and door operating conditions shall typically be not more than 20mg peak to peak (adjacent peaks) in the 1-10 Hz range.

11.2 Acceleration and deceleration shall be smooth, constant and typically not less than 3 feet/second, with an initial ramp between 0.5 and 0.75 seconds.

11.3 Sustained jerk shall be not less than 6 feet/second.

11.4 Measurement and evaluation of the ride quality shall be consistent with ISO 18738, using a low pass cut-off frequency of 10.

12 RUNNING CLEARANCE

12.1 Where achievable based on the design of the elevator equipment, the running clearance between the hall sill and the cab sill shall be reduced to less than 1” and not exceed the code

maximum of 1.25” to provide a smooth transition for wheeled carts and/or equipment over the gap.

13 VIBRATION AND ACOUSTICAL ISOLATION

13.1 Elevator equipment shall be sufficiently isolated to avoid transmitting noise and vibration to the structure.

13.2 Design for vibrations and isolation of structural components shall meet the requirements of CSA Z8000.

13.3 Design of all elevator components shall consider the frequency of the surrounding building.

14 ACOUSTICAL LIMITS

14.1 Machine room noise levels shall not exceed 80 dBA.

14.2 Door operation noise levels shall not exceed 63 dBA (CSA 8000).

14.3 Sound levels shall be measured in accordance with industry standard sound meters and specification.

14.4 Sound meters, if deemed necessary for clinical reasons shall be provided in the machine room, the cab and in any areas deemed sensitive to acoustical limits by the HCF. The sounds meters shall monitor and record data, that can be provided to the HCF.

15 PAINTING

15.1 At the end of the construction or modernization project, elevator pits shall be thoroughly cleaned to remove any residual grease, oil and any debris. Elevator pit floor and walls, shall be painted with a grey, high-gloss durable paint up to the level of the lowest landing. The Elevator pit floor shall be painted with a white or grey semi-gloss durable paint.

15.2 At elevator construction completion, the machine room floor shall be thoroughly cleaned to remove any residual grease, oil and debris. Any holes in a concrete floor will be patched or repaired with concrete to match existing floor. The floors shall be painted with a white or grey semi-gloss durable paint.

15.3 For clean and sterile processing elevators (including dumbwaiters), the full height of hoistway walls, including the elevator pit walls, shall be painted with a white high-gloss, anti-microbial, durable paint to aid infection control.

15.4 Paint product specifications shall be provided by the contractor to the Project Manager for approval by HA before painting commences.

15.5 Paint safety guards and moving parts such as the outside of the elevator sheave related components safety yellow.

15.6 Where practical, provide a painted yellow line 8” wide on the floor with the word “CAUTION” stencilled in contrasting colour separating the immediate machine area(s) from remaining elevator equipment room.

16 EMERGING TECHNOLOGIES

16.1 Proposals for new technologies shall be provided including but not limited to those that aid in limiting patient risk, increase infection control and improve passenger circulation times.

16.2 Particular consideration shall be given to technologies that address energy efficiency and environmental performance.

16.3 All technologies proposed for implementation must have an established and proven track record to be included in the specification. Final approval is required from the Manager, Contracts and Optimization.

17 GUIDES

17.1 Elevators shall be equipped with roller guides for the cab and counterweights.

18 TRAVELLING CABLES

18.1 Travelling cables shall be designed for the appropriate elevator use.

18.2 A suitable number of spare conductors shall be provided:

.1 Four (4) shielded pairs above those pairs used for the control and operation of the elevator
.2 Two (2) spare #14 gage conductors
.3 Ten (10) spare #18 conductors

18.3 Travelling cables shall take into account future technological needs at the time of installation.

18.4 Travelling cables shall be round, not flat, for all elevators.

19 DOOR OPERATORS

19.1 Heavy duty door operators with closed loop control shall be provided to all elevators.

19.2 Preference shall be given to heavy duty linear door operators. Acceptable products are the VFE2500 Linear Door Operator by GAL Canada or approved equivalent.

19.3 Where linear door operators are not practical, spring door operators shall be utilized. Acceptable products are the MOVFR or ECI 2500 Harmonic Operator by GAL Canada or approved equivalent.

19.4 Where door operators are replaced, all door rollers, linkages and guides shall be replaced.

20 FRONT AND REAR ENTRANCES

20.1 Front and rear elevator entrances in the same cab shall only be used when there is an unavoidable operational necessity. Their use shall be limited as much as possible to reduce ongoing MEO requirements, increased risk of damage to elevators and to simplify way-finding.

20.2 The design of the elevator and elevator cab must be able to withstand heavy use and bumping without damage to doors and panels rendering the elevator inoperable.

21 CAB OPERATING PANELS

21.1 Every elevator and associated operating panel(s) shall be wired to provide fire service, security, priority service and Medical Emergency Operation (MEO) features, regardless of the whether the feature is deemed a requirement of the facility at the time of design.

21.2 Medical Emergency Operation shall be wired in all elevators as the building and elevator requirements may change over time, exceptions may be made for Freight Elevators.

21.3 Floor/level labels shall match the floor/level labels of the facility.

21.4 For certain situations, touch screens may be considered for ease of cleaning and maintenance. Buttons are preferred. Areas that may be considered for touch screens are:

.1 Towers such as JPS at VGH or Columbia Tower at RCH
.2 MDRD elevators (for infection control purposes)
.3 Heliport Elevators for providing information in the Elevator cab (ie: MEO operation)

21.5 At a minimum, the following components shall be provided to each operating panel:

.1 A single button per floor (except for front and rear doors where necessary)
.2 An emphasis mark for the lobby/main floor such as a star or asterisk
.3 Door open and door close buttons
.4 A door hold button shall be provided for each front and rear doors (where applicable).
.5 A surface mounted independent service keyed switch with the appropriate designated coloured ring
.6 A fire service operation keyed switch with the appropriate designated coloured ring
.7 An emergency call button An alarm button
.8 A card reader (for MEO, Priority Service etc.) preferably integrated flush with the operating panel

21.6 Door open, door close, and door hold buttons shall be engraved in English with the description of their function in addition to the code requisite international symbol.

21.7 Car call and door operation buttons shall be equipped with LED illuminating rings or elements.

21.8 All components of the operating panel shall be selected to minimize joints, recesses and dirt traps to aid in the management of infection control. Approved manufacturers of car and hall operating panels include Dupar, MAD and Schaefer with these specifications incorporated.

21.9 All operating panel materials shall be selected to tolerate the regular use of hospital grade cleaning agents without degradation.

21.10 All operating panel materials shall be selected to tolerate occasional sterilizing cleaning agents (such as bleach) without degradation.

21.11 Where front and rear doors are required, front door call buttons shall be located on the left side of the operating panel; rear door call buttons shall be located on the right side of the operating panel, front and rear line up on the same level. Door operation buttons shall be clearly labelled as the front and rear doors e.g. [F3, R3] or [F1, R3].

21.12 Where front and rear doors are required, two operating panels shall be provided, one at each end of the elevator cab adjacent to the doors.

21.13 Cab operating panels shall include a hands free phone and activation button which shall have a priority call service connection to 24/7 personnel (not voicemail) monitoring, per the facility emergency response protocols, procedures and contracts.

21.14 A cab position indicator shall be mounted at the top of the panel, or programmed into the display screen of the operating panel, to indicate the current location and direction of travel of the elevator.

21.15 At least two (2) spare slots shall be provided in the service panel for future services.

21.16 An electrical outlet shall be provided with ground fault circuit protection in the service panel and in the side of the cab. For clarity, the cab electrical outlet is provided for convenience.

21.17 An emergency cab light shall be provided.

21.18 Subject to HCF request and approval, options for in-cab display screens (in addition to touch screens for elevator operations) that meet the TSBC requirements shall be provided if requested by the HCF.

21.19 For elevators that are equipped with a display screen, floor/level labels shall be programmed specific to the HCF requirements. Text and information presented shall be agreed to in writing with the Facility Manager and/or designate(s), prior to preparation of shop drawings by the contractor.

21.20 Stainless steel buttons and components of the operating panel are often preferred in Healthcare settings. Stainless steel, or, copper alloy plating of all elements on the operating panel – with the intent of improving infection control - shall be included as an alternate option for pricing in construction documents.

21.21 Layout examples of operating panels are included in the Appendices to this document and shall be used as the basis of design for all operating panels.

21.22 Integrated flush mount card readers (for MEO, Priority Services, etc.) shall only be considered when specifically requested by the HCF. In most cases, they should be avoided.

21.23 Options for in-cab display cases for advertising and media that meet infection control and TSBC requirements shall be provided when requested by HCF's.

22 DOOR HOLD

22.1 A door hold function shall be installed on every elevator installed in a HCF with the exception of Freight Elevators which are application specific.

22.2 The door hold function is initiated by a push button in the cab to extend the door dwell time and allow the movement of slower passenger, beds or other equipment that requires extra time to load or unload.

22.3 The door hold button shall be centrally located on the operating panel, adjacent to the door open and close buttons, clearly labelled "DOOR HOLD".

22.4 The door hold button shall illuminate while in door hold mode.

22.5 Door hold mode shall be canceled by pressing the door close button.

22.6 The door hold function shall be adjustable for each elevator to extend the door dwell time between 20 - 120 seconds. By default, the door hold dwell time shall be set to 45 seconds

23 HALL CALL BUTTONS

23.1 Hall call buttons shall be located in the most convenient location (e.g. closest to the main circulation route) for single elevators or groups of multiple elevators.

23.2 Hall call buttons intended for staff use only shall be located adjacent the elevator or bank of elevators in consultation with the HCF's, fully separated from call buttons used by the public. Signage shall indicate staff use only.

23.3 Where practical, preference shall be given to Vandal Resistant Jumbo Hall Call Buttons.

23.4 If the cab operating panels utilize touch screens, obtain alternative pricing for touch screen hall call buttons.

23.5 Supplementary information is included in the Appendices to this document.

24 HALL LANTERNS AND POSITION INDICATORS

24.1 Hall lanterns and position indicators shall be provided above each elevator door, at each landing location.

24.2 Where only one (1) elevator is provided, a hall lantern and position indicator shall be provided at each elevator lobby above the doors.

24.3 The specification of the position indicators shall also be selected to allow the display of exception indicators to indicate, as a minimum, the following signals:

.1 Elevator Travel Direction
.2 Fire Fighter Operation
.3 Medical Emergency Operation
.4 Out-of-Group Operation (including independent service, priority service, inspection etc.)
.5 Out of Service

25 IN-CAB LANTERNS

25.1 Where only one (1) elevator is provided, in-cab lanterns are acceptable in lieu of hall lanterns.

26 VOICE ANNOUNCER

26.1 In-cab voice announcers shall be provided capable of broadcasting audible messages that shall, as a minimum:

.1 Be mounted in the cab operating panel
.2 Shall have a field programmable selection for type of voice and basic messages which include but not limited to:

i. Landing where cab is stopping
ii. Direction of travel
iii. Nudging Operating
iv. Fire Fighter Operation
v. Emergency Power Operation

27 PHONES

27.1 Separate elevator phone lines are required for each elevator run to the elevator machine room or agreed termination point for the building from the elevator cab.

27.2 Approved phone products for installations and upgrades are Emercom, , Rath MicroTech and Webb. Phone products for the elevator must be non-proprietary and able to be re-programmed at any time by any qualified elevator technician.

28 IN CAB POSITION INDICATORS

28.1 Cab position indicators shall be provided in each cab operating panel.

28.2 Cab position indicators shall have digital displays with a minimum display height of 50 mm.

28.3 Cab position indicators shall show at least:

.1 Landing where elevator has stopped
.2 Arrows showing direction of travel when the elevator is moving

28.4 Where a display panel is provided in the operating panel, the position indictor shall be integrated into the programming of the display panel.

29 CAB INTERIOR FINISHES

The objective for all cab interiors is to provide aesthetically pleasing results that effectively complement infection control requirements, patient, staff and public transport and comfort. Cab interior finishes shall vary based on the type and usage of each elevator and HCF. The following are considered general best practices.

29.1 All cab interior finishes shall be selected to tolerate the regular use of hospital grade cleaning agents without degradation.

29.2 All cab interior finishes shall be selected to tolerate occasional sterilizing cleaning agents (such as bleach) without degradation.

29.3 Cab Interior Finishes – Flooring

.1 All Elevators shall be equipped with a durable flooring surface suitable for healthcare such as Tarkett Healthcare Flooring, Marmoleum by Forbo, or approved equivalent. Products shall be slip resistant, resilient flooring with anti-microbial properties and installed between cab walls and/or bumpers rails such that the flooring can be removed independently of other elevator components. In new elevator installations the elevator sub floor shall be steel to increase the longevity of the elevator.
.2 No jointing shall be permitted in floor covering.
.3 Checker plate floor covering shall not be utilized unless in a specialized application such as a garbage freight elevator.

29.4 Cab Door Finishes (Interior)

.1 Cab door panels shall be finished with an ASTM type 304 brushed stainless steel #4 finishes with a vertical grain.

29.5 Cab Wall Finishes

.1 Laminate finishes shall be provided from the floor to the intersection with the ceiling.

.2 For larger cabs where seams are necessary, they shall be vertical and placed symmetrically in the cab. Seams shall be minimized and as flush as possible to avoid dirt traps and facilitate ease of cleaning.
.3 An electrical outlet shall be provided in the sidewall of the Cab in addition to any that may be in the COP/Service Panel.
.4 Trespa, stainless steel or other approved product equivalents are to be used for Cab interirors.

29.6 Elevator Handrails

.1 Handrail terminations shall be turned into the cab wall to prevent snagging. Handrail ends shall terminate tightly flush to the cab wall.
.2 Handrails shall be continuous around cab walls to minimize terminations and fixtures.
.3 Handrail profiles – circular or flat – and offsets from the cab wall shall be selected to suit the predominant requirements of patients at the HCF.
.1 If the elevator is a Service or Freight Elevator used for patient transfer, food transfer, housekeeping, or facility operations flat hand rails should be considered
.2 If the elevator is a passenger elevator used in acute hospitals, residential care facilities, or specialized HCF's (i.e. BC Cancer) then round hand rails should be considered.
.4 An option for copper alloy film coating – to aid in managing infection control - shall be requested as an alternate option in the tender/RFP documents.
.5 All handrails shall be easily demountable for replacement if/when damaged.

29.7 Bumper rails

.1 Service cabs, freight elevators or other elevators where the HCF requires additional cab protection due to predominant usage, shall be equipped with durable timber bumper rails to protect the lower walls from damage from carts and other vehicular traffic on all cab walls without doors.
.2 In passenger elevators, lower bumper rails are optional based on feedback from the HCF, but if installed shall be stainless steel located on all cab walls without doors.
.3 All bumper rails shall be easily demountable for replacement if/when damaged.
.4 Finished height off finished flooring should be equal or close to 3.5" to the bottom of the bumper rails or as otherwise specified by the HCF.

30 CAB LIGHTING

30.1 All elevators that are primarily used for Patient Transport shall be equipped with indirect lighting. The HCF shall be consulted on the use of direct/indirect lighting. LED strip lighting is preferred. Lighting provided shall meet the minimum requirements per the Safety Code for Elevators (100 lx).

30.2 Elevators that are not primarily used for patient transfer may utilize LED pot lights. LED strip lighting is preferred in most cases unless pot lights already exist. The HCF shall be consulted on

the use and type of direct/indirect lighting. Lighting provided shall meet the minimum requirements per the Safety Code for Elevators (100 lx).

30.3 Designs shall avoid the collection of dust, minimize cleaning requirements, and meet minimum infection control requirements.

30.4 Lighting fixtures shall be located in the ceiling recesses. Bulbs where used shall be replaceable without the requirement to gain access above the ceiling space. See Appendices for indicative sketch.

31 ELEVATOR ENTRANCES, DOOR FRAMES AND DOOR FINISHES

31.1 The finish of lobby/hall doorframes and doors shall be specified as appropriate to the HCF.

.1 In hospital and acute care facilities, door frames and hall door panels shall be stainless steel.
.2 In care homes or administration buildings, alternative finishes such as painted or baked enamel, or wood shall be considered, as appropriate for the HCF.
.3 Laminate or stainless steel corner returns, as appropriate to the facility, shall be provided as protection to all hall wall returns.

31.2 Infrared detectors shall be provided to all elevator entrance doors to signal the door to stop and re-open when the curtain of light beams is disrupted.

31.3 Detectors shall be provided for all elevators, excluding freight, to signal the operation of the door (i.e. green if open, flashing red if closing). Acceptable products include Panachrome by Avire, or approved equivalent.

32 REQUIREMENTS FOR HYDRAULIC ELEVATORS

32.1 The use of hydraulic elevators shall be limited to appropriate building applications in lieu of traction elevators.

32.2 Where an elevator machine room wall is also an external building wall, a tank heater shall be provided.

32.3 An oil level indicator, with a visual display of the oil level, shall be provided on each hydraulic elevator tank.

32.4 Gate valves shall be provided, both in the machine room and in the pit of each elevator.

32.5 A motor soft starter shall be provided on all hydraulic elevators.

33 REQUIREMENTS FOR TRACTION ELEVATORS

33.1 Cab frames and platforms shall be balanced to ensure the cab frame rests, without putting unnecessary pressure on the cab guides.

33.2 Traction machines shall be mounted such that they are adequately isolated from the building structure to prevent the transmission of noise and vibration through the building structure.

33.3 Cab platforms shall be suitably isolated from the cab frame to allow for smooth ride quality.

33.4 Traction motors shall be placed in a machine room.

33.5 All parts of the traction motor and machine shall be non-proprietary as outlined in these Technical Guidelines.

34 MACHINE GUARDING

34.1 Guards shall be provided to machines with traction sheaves to:

.1 Provide a safe machine room environment;
.2 Protect the ropes from any machinery or equipment that may fall.

35 CONTROLLERS

35.1 Controllers shall be non-proprietary as defined by these guidelines.

35.2 Controllers shall have built-in, on-board diagnostics. Access to diagnostics and fault codes shall be readily available with the control equipment, and shall be displayed and logged on a non-proprietary network.

35.3 Controllers shall be approved in accordance with the A17.1/B44-07 Safety Code for Elevators.

35.4 Controllers shall be provided with suitable electrical protection in the event of power fluctuations and other low, high or zero voltage conditions.

35.5 Controllers shall have all of the operational capabilities to meet the requirements in these specifications.

35.6 Controllers shall be equipped with an RFI Filter to reduce EMI and RFI noise.

35.7 Controllers shall comply with IEEE 519.

35.8 Acceptable manufacturers for non-proprietary controllers include MCE I-Control for high demand elevators or groups, MCE 4000 for low demand traction elevators or groups, MCE 2000 for low demand hydraulic elevators or groups, and approved equivalent(s). Preference shall be given to I-Control systems, or approved equivalents, for car groups with high demand or additional features such as MEO, Priority Service, Fire Service, Security, etc.

35.9 All controller(s) mounts shall be seismically restrained.

35.10 All controllers shall be installed on a raised platform provide by the OEM in the machine room.

35.11 Controller shall be located in the machine room of the elevator.

36 ELEVATOR IDENTIFICATION

36.1 Elevator identification is noted as a critical design element, in particular at HCFs with multiple buildings and multiple elevators.

36.2 All elevator identifications shall be coordinated with the existing HCF where there are existing buildings and elevators.

36.3 Elevator identification shall be logical numbers/codes that relate to the HCF and existing elevators.

36.4 Repetition of numbers/codes and/or identifiers that are similar shall be avoided, including between buildings at the same HCF.

36.5 All proposals shall be approved by the Manager, Contracts and Optimization, Facility Manager, prior to design completion.

36.6 All motors and controllers shall be clearly labelled with the elevator name and TSBC identification number clearly visible for any inspection or maintenance.

37 ELEVATOR DISPATCHING

37.1 Collective Operation for Single Elevators:

.1 Cabs shall operate from call buttons located within the cab and hall call buttons located at each floor landing. When a cab is available, it shall automatically start and dispatch to the registered hall call location. Once the cab starts, it shall respond to registered calls in the direction of travel and in the order the floors are reached.
.2 The cab direction shall not reverse until all calls have been answered, or until all hall calls ahead of the cab and corresponding to the direction of cab travel have been answered.
.3 Calls shall be answered corresponding to the direction in which the cab is traveling, unless the call in the opposite direction is the highest (or lowest) call registered.
.4 Call buttons shall illuminate to indicate call registration. Extinguish call buttons once calls have been answered. In cab calls shall be cancelled in the same manner.
.5 The elevator shall remain at the last call answered for an adjustable time period, by default set at five (5) minutes. Once this time period has expired, the elevator shall return to the main lobby.

37.2 Group Control and Dispatching

.1 The cabs shall operate as a group, capable of balancing service and providing continuity of group operation with one or more cabs removed from the system.
.2 A hall call(s) shall be rendered ineffective until cab doors begin to close after passenger transfer. In cab calls shall be cancelled in the same manner. Priority shall be given to coincidental cab and hall calls in the cab assignment.

.3 The controls shall be programmed to meet changing traffic conditions on a service demand basis. Provisions shall be included for to control heavier traffic in either direction, intermittent or low demand. As traffic demands change, group and individual cab assignments shall automatically and continually change to provide the most effective and efficient means to handle current traffic flow. Means to detect long-wait hall calls shall be provided with preferentially service response capabilities.

.4 Priority shall be provided to coincidental cab and hall calls in hall call assignment.

.5 Cab direction reversal shall be achieved without closing and reopening cab doors.

.6 System software shall be easily reprogrammable. A basic algorithm shall be designed to optimize service, based on equalizing system response of registered hall calls and equalizing passenger trip time to the shortest possible time.

.7 Floors below main floor shall be programmed to logically minimize delays in passing or stopping at the main floor in both directions of travel. Manual means shall be provided to force a stop at the main floor when passing to or from lower levels.

.8 Backup dispatching shall function in the same manner as the primary dispatching.

.9 Delayed cabs shall automatically be removed from group operation until the delay has been resolved.

.10 The cab position shall update on position indictors (hall and cab) when passing or stopping at each landing.

.11 Multiple power sources and separate fusing shall be provided for call button risers to avoid hall call button failure.

.12 Serial or duplicate communication links for all group and individual cab computers shall be provided.

38 REMOTE ELEVATOR DISPLAY, MONITORING, AND CONTROL

38.1 Unless otherwise provided in writing by the Manager of Contracts & Optimization, Facility Manager or Clinical Operations, independent monitoring screens shall be provided at designated locations in the facility or other designated locations within the HCF site.

38.2 All remote monitoring systems shall be non-proprietary.

39 ELEVATOR MANAGEMENT SYSTEM

39.1 Non-proprietary Elevator Management Systems (EMS) shall be provided as appropriate to the size and complexity of the HCF.

39.2 All elevators shall be equipped with programmable inputs to accept signals from the facility Building Automation System to provide multiple functions including but not limited to restrict the ability to put additional cabs on independent service, if one (1) cab in a group is already out of service.

39.3 The elevator shall be equipped with programmable outputs to allow discrete signals to be sent to the facility building automation system, including but not limited to when the:

.1 Cab is out of service;

.2 Cab is on medical emergency;
.3 Cab is on inspection operation;
.4 Cab is on independent service;
.5 Cab is in fire service.

39.4 The EMS shall maintain a record of every status point change occurring on the monitored equipment and provide the ability to replay these events in simulation at a later date in real time, slow speed, single-step, reverse or fast forward. This information shall be retained for a period of at least twenty-six weeks and archived and automatically sent monthly to the Facility Manager or their delegate (delegates) thereafter.

39.5 The EMS shall store traffic fault and statistical data for a period of at least three (3) years. The system shall log error type, cab number, floor position, and major system status points whenever a fault or logged event occurs.

39.6 The EMS shall provide interactive control of required features provided in the elevator control system. These features shall be revised as the requirements of the building change. Interactive controls may include but are not limited to security floor lockouts, entering cab and hall calls, firefighters' service, lobby recall, priority service and up/down peak service.

39.7 In the case of a power failure, the EMS shall be capable of connecting to an emergency power back-up unit. The loss of power shall not affect any stored data. The system shall have the capability to detect the loss (disconnect) of any individual unit from the monitoring system, by periodically polling all units to ensure that normal communications between the unit(s) and the terminals/server are maintained.

39.8 The EMS shall automatically and immediately re-boot the program and continue to operate after a power loss or other system malfunction.

40 INDEPENDENT SERVICE

40.1 A keyed switch shall be provided with the appropriate designated coloured ring, surface mounted to each cab operating panel marked "Service".

40.2 When the key is turned to the "ON" position, the cab shall be removed from group operation and not accept any hall calls.

40.3 The elevator shall park with the doors open at the required floor.

40.4 An in-cab call can be registered, and operation of the elevator shall be initiated, when the cab call or door close button is continually pressed, until the cab doors are completely closed.

41 INSPECTION OPERATION

41.1 Inspection operation shall be provided in all elevators in accordance with Safety Code regulations.

42 HOISTWAY ACCESS OPERATION

42.1 Hoistway access operation shall be provided in all elevators in accordance with Safety Code regulations.

43 MEDICAL EMERGENCY OPERATION (MEO)

43.1 Note: Medical Emergency Operation (MEO) was formerly referred to as “Code Blue”.

43.2 Definitions

.1 MEO Stage 1 is the operation where an elevator is recalled directly to a specific level as requested by HCF Staff

.2 MEO Stage 2 is the operation of the elevator after MEO has been initiated from within the cab.

43.3 MEO shall be installed to provide rapid response in a Medical Emergency.

.1 MEO should be installed on the majority of elevators in a HCF as the purpose of the areas the elevators serve tend to change over time. Exceptions are freight elevators, bed lifts, scissor lifts, and barrier free lifts.

.2 MEO is installed to provide medical staff priority use of the elevator to provide rapid response in a medical emergency.

43.4 MEO Stage 1 shall be initiated by standard keys in all cases and a corresponding key switch ring with the appropriate designated matching colour. They shall be equipped with:

.1 Three (3) positions: CANCEL / OFF / CALL. The “Off” position shall be the neutral position where the key can be inserted and removed. The “CANCEL” and “CALL” positions shall be a momentary position to toggle the request between call and cancel requests.

.2 An illuminating indicator adjacent to the switch shall indicate that a cab is being called for a MEO.

.3 Remote call locations may be required to initiate MEO operation from other locations for the convenience of the medical emergency staff. The locations include but are not limited to Nursing Stations, Emergency Rooms, Heli-Pad landings or other location where expediting the MEO operation will ensure better and faster cab response times for the patient. Design considerations shall be included to prevent false calls from remote call locations.

44 PRIORITY SERVICE OPERATION (PSO)

44.1 Priority Service Operation shall be provided where elevators are required to move patients on beds or other large equipment that requires an empty elevator.

44.2 PSO initiating buttons are to be mounted in a discrete location, to be agreed with the Facility Manager, away from the main hall push button risers.

44.3 Priority Service initiated by a proximity reader shall be arranged as follows.

.1 A key switch with the appropriate designated colour ring shall be provided at every elevator landing location designated by the Facility Manager and/or delegate(s) and labelled “STAFF ONLY”.
.2 The key switch shall have three (3) positions: CANCEL / OFF / CALL. The “Off” position shall be the neutral position where the key can be inserted and removed. The “CANCEL” and “CALL” positions shall be a momentary position to toggle the request between call and cancel requests.
.3 An illuminating indicator adjacent to the switch shall indicate that a cab is being called for a PSO.
.4 The actuation of a priority service switch shall remove the elevator from group operation, complete any cab calls previously made by current passengers, and then respond directly to the priority service level called with the intent that the elevator should then be empty.
.5 The elevator shall make one (1) express run once it has responded to an express priority call and then return to normal group operation.

44.4 Priority Service initiated by a keyless system shall operate as follows:

.1 A switch shall be provided and labelled “STAFF ONLY”
.2 The actuation of a priority service switch shall remove the elevator from group operation, complete any cab calls previously made by current passengers, and then respond directly to the priority service level called with the intent that the elevator should then be empty.
.3 The elevator shall make one (1) express run once it has responded to an express priority call and then return to normal group operation.

45 WANDERING PATIENT / INFANT THEFT SYSTEM REQUIREMENTS

45.1 Elevators shall be equipped with software that shall interface with a third party wandering patient / infant theft system. Requirements shall be determined at each HCF during the design specification phase.

45.2 If the wandering patient / infant theft system detects that a patient is in an elevator, the elevator shall not accept any cab calls.

45.3 The elevator system shall have the means to accept an additional input for an override of the wandering patient / infant theft system, to permit the activation of cab and hall calls by a third party external to the elevator.

45.4 The wandering patient / infant theft system shall be connected to the elevator control system in the machine room and provide dry contacts to activate the lock out of floor calls. These connections shall only be permitted in the elevator controller junction box described in Section 5 of the General Requirements for Elevators.

46 RESTRICTED ACCESS

46.1 Note: Restricted access to elevators is intended to fulfil two functions:

a) Restrict access to various floors from within the cab (restricting cab calls)

b) Limiting access to elevators (restricting hall calls)

46.2 The default standards for floor security access are as follows:

.1 The security systems shall be isolated from the elevator control system with an interface box and terminal strips (see also Section 5 of this document).
.2 Elevators shall have resident software capable of interface with security systems.

46.3 Restricted Cab Call Operation

.1 Restricted access to car calls is to prevent unauthorized access to various floors and provides secure access for designated users.
.2 The security system shall provide one (1) dry contact in the machine/control space per floor designated as under restriction.
.3 Fire Fighter Operation Phase II must override any restrictions on cab call buttons.

47 SECURITY

47.1 Where security cameras are provided within the cab interior (for safety, wandering patient, infant theft or other) the following criteria shall be met:

.1 Adequate conductors shall be provided to the travelling cable
.2 Mounting of camera shall be by an elevator contractor
.3 Site specific requirements and restrictions shall be coordinated with the facility

48 EMERGENCY BACKUP POWER

48.1 The number of elevators required to be equipped with emergency backup power shall be designated separately for each HCF.

48.2 When elevators are operating on emergency backup power, elevators shall automatically recall and park elevators at designated floors. This is typically the lobby but will vary at certain HCF for critical patient requirements.

48.3 The elevator software shall accept an input from the building to advise that the elevators are operating on emergency backup power

48.4 The elevators software shall accept a pre-transfer signal from the building, to advise that the source of power is about to change (either from Normal to Standby, or returning to Normal Power). If this signal is “ON” , elevators shall remain parked, or any elevators in motion shall stop at the next landing and open the doors to decant the passengers. Required response times shall be provided in each project specification suitable for the HCF.

48.5 The number of elevators required to run on emergency backup power shall be determined as appropriate to each HCF in conjunction with the Facility Manager, their designate(s) and/or the HA. Typically a minimum of 1 elevator per group shall be equipment with emergency backup power.

48.6 During specification preparations, any current generator capacities and connections required for designated elevator emergency backup power shall be confirmed. If the information is not available from the facility, it shall be included for review and confirmation by the contractor.

48.7 When power at a facility is lost but immediately reinstated, all elevator systems shall have the capacity to automatically return to service, within 5 minutes, without the requirement for servicing or the maintenance vendor to reset the system.

48.8 All emergency back-up systems must be tested prior to commissioning including under load to ensure generators, switchgear, controllers and transfer systems are fully operational and function as intended for the elevator to function. The tests must be documented, witnessed and signed off by the elevator consultant of record, elevator installation company, Facility Manager or Contract Manager, Facilities or their designates.

49 EMERGENCY RECALL OPERATION

49.1 Emergency Recall operation is required on all new elevators.

49.2 The selection of the designated recall level and any alternate recall levels shall be determined based on the minimum requirements of the safety code, and for the safety of the patients and non-ambulatory passengers. For example, a parkade level may be a better alternative for wheelchair bound passengers to safely exit the building.

49.3 The requirements of the fire department shall be considered where conflicts in requirements are identified.

50 SIGNAGE

50.1 Elevators shall be provided with signage and markings per all relevant codes.

50.2 Elevators shall be identified at the main recall level and all levels of buildings more than 3 stories.

50.3 Elevators shall be provided with hall tactile identification markings on both sides of the jambs at each landing for the visually impaired.

50.4 The Designated Fire Fighter Elevator shall be identified as the recall level.

50.5 The alternate recall level of the elevators shall be marked on the fire service keyed switch and at remote fire service switch locations.

51 TRAUMA PATIENT ELEVATOR CABS

51.1 Non-public use elevators used to transport patients shall have the capacity to accommodate a bariatric bed, up to four staff, four IV pumps, extra corporeal life support equipment, portable ventilator, oxygen tanks and monitors; and have enough space to allow for staff to complete emergency procedures within the elevator.

51.2 Custom sizing of these elevators shall be provided by the trauma team at each HCF. Where achievable, the elevators shall be designed through the assessment of actual simulations prior to specifications.

52 SERVICE ELEVATORS

52.1 Any elevator that is used primarily to move heavy services, including but not limited to linen, food, supplies or portable MRI machines, shall be rated as Class C loading (in accordance with the most recent edition of the B44 Safety code for Elevators).

52.2 Service elevators for movement of food services supplies and/or other heavy loads (e.g., portable X-ray) shall be provided. Where service elevators are provided, at least one shall have a minimum loading capacity to accommodate a single piece load of at least 2270 kg and single axle loading of 1135 kg.

53 MEDICAL DEVICE REPROCESSING VERTICAL TRANSPORTATION

53.1 Where vertical transportation is required for medical device reprocessing, preference shall be given to elevators rather than dumbwaiters and separate elevating devices provided for each of the sterile and soiled processes. Any installation of dumbwaiters in Acute Care facilities requires the approval of the Manager of Contracts & Optimization and Vancouver Coastal Health.

53.2 Where Medical Device Reprocessing is the elevators main function the level of infection control shall increase and the final design shall be signed off by the clinical staff on site, infection control, and the manager/director for the medical device reprocessing department for that HCF.

53.3 All devices for Medical Device Reprocessing using dumbwaiters shall be of robust design with special consideration given to doors, locks, motors and equipment to ensure reliable and continuous operation without failure or breakdowns and continuity of supply and technical support.

54 ALLOWANCE FOR ADDITIONAL WEIGHT

54.1 Elevators shall be provided with the capacity to accommodate 10% extra weight for cab finishes above the rated capacity.

55 EQUIPMENT ACCESSIBILITY

55.1 Provisions shall be made to elevator components and/or designated spaces to enable the removal and/or replacement of the largest elevator component from the space for servicing and/or replacement at a later date. This includes but is not limited to machine room doors and, where required, access hatches in the machine room floors and/or walls and/or external cladding to transfer and land equipment. Special consideration shall be shown provided if a crane is required designating where they will set and the limits available to operate within up in any future modernization or repair required. Where required, particularly at sites with restricted access to

the machine room and/or HCF surroundings, elevator components shall be designed to be removed in smaller components to facilitate reasonable removal and/or replacement.

55.2 Hoist beams shall be provided in hoist ways, machine rooms and control spaces to facilitate servicing of elevator components and removing sections of the elevators and equipment as required.

56 ELEVATOR MACHINE ROOMS

56.1 All elevators shall be equipped with a machine room.

56.2 Where requested, an IT drop shall be provided in machine rooms for the purposing of transmitting information from the local controller to a remote monitoring station.

PART 3 – ELEVATORS IN NEW HEALTHCARE FACILITIES

57 INTRODUCTION

Part 3 of these guidelines is intended for use in specifying new elevators in new HCFs.

57.1 Elevators shall be located and designed to accommodate the diverse activities of each HCF, and their crucial role in HCF operations, care, staff and patient circulation, Elevators must contribute to the overall efficiency and effectiveness of facility operations for staff and patients,. Elevator systems shall be designed to accommodate the wide range of user and functional requirements to satisfy requirements for safety, reliability, longevity, responsiveness, accessibility, and operational efficiency. In most acute hospital settings, the impact of patient flow will be a major consideration when designing the elevator. In conjunction with associated architectural, structural, and related design provisions, elevators shall be designed to accommodate potential vertical expansion, increased capacity and/or change-in-use of the HCF, with a minimum of alterations. This may be accomplished through the inclusion of additional elevator shafts for future development.

58 ELEVATOR DESIGN BY FUNCTIONAL REQUIREMENT

58.1 Elevator design shall take into consideration the end use of the equipment. The purpose of the elevator shall be defined at the commencement of every project and the necessary technical guidelines incorporated into project specifications for approval by HA and Manager, Contracts and Optimization.

58.2 Various Elevator Purposes include but are not limited to:

.1 Heavy Passenger Use (Acute Hospital with Heavy Use).
.2 Patient Transfer – Traditional
.3 Patient Transfer – Trauma
.4 Patient Transfer – Bariatric
.5 Administration
.6 Research (requiring to carry sensitive, often heavy freight)
.7 Residential Care Home
.8 MDRD (Clean and Soiled for Materials Reprocessing)
.9 Parkades
.10 Elevator dedicated to carrying freight, garbage, linen, food
.11 Clinical
.12 Helicopter Landing Pads
.13 Wheelchair Lift

59 ELEVATOR QUANTITY, SPEED, SIZE AND CAPACITY

59.1 Elevator service in a HCF shall be evaluated based on demands placed on the system during a typical, fifteen-minute, heavy, two-way traffic period, (i.e. considerable traffic is being handled in both the UP and DOWN directions), with passenger and vehicles entering and exiting the cabs at various floors throughout the elevator round trip.

59.2 An elevator analysis, to provide service excellence at all HCFs, shall be provided and be predicated on the projected number of patient, staff counts in the facility and the projected vehicle traffic. The number and grouping of elevators required for a specific project shall be determined following traffic studies by an experienced vertical transportation professional.

59.3 For each HCF, calculations shall be based on actual facility operations, anticipated traffic movements and populations. Additional guidelines and examples are included in the Appendices to this document and shall be integrated into all designs.

59.4 The design shall assume that staff shall travel on both general public and patient transfer systems.

59.5 Passenger elevators shall have a handling capacity of at least 12% of the total population for a peak 5 minute period.

59.6 For adequate elevator service, the following average wait time (AWT) interval is required, unless stated otherwise:

.1 Public (ambulatory passenger) elevators 40 seconds
.2 Patient elevators, 30 seconds
.3 Service elevators, 35 seconds
.4 Clean and soiled, 45 seconds
.5 Load Factor: Passenger elevators shall provide adequate service with a load factor below 40%. Load factor refers to the number of passengers transported by each elevator during one trip, expressed as a percentage of the maximum number of passengers permitted by the Safety Code for Elevators and Escalators.

59.7 Distinct separation of traffic types shall be provided, with passenger elevators for public, patient; and trauma elevators for inpatient traffic; and service elevators for materials and logistical traffic.

59.8 Grouping of elevators, rather than providing single units or small groupings at various locations, shall be provided.

59.9 Elevators shall be located to provide separation of traffic types in addition to minimization of walking distances. Horizontal walking distances of up to 45-60m (150-300 feet) are generally acceptable for staff and visitors. Distances of 86-93m horizontal meters (250-300 horizontal feet) are generally acceptable for materials handling elevators.

59.10 When more than one elevator group is available, a person or vehicle origin does not necessarily dictate which vertical transport element that will be used. A certain percentage of the population will migrate to other areas of a facility and may not use the same elevator throughout the day. Elevator design shall accommodate a minimum migratory imbalance of 10%.

59.11 Elevator system capacity shall be based on the peak traffic conditions. The design shall address the following service criteria:

.1 Traffic Patterns
.2 Handling capacity

.3 Average interval
.4 Average cab loading

60 TYPE OF ELEVATOR

60.1 Hospital facilities with three or more levels shall employ traction type elevators with a machine room for public and other high traffic elevators.

60.2 Machine room less elevators shall not be permitted or installed.

60.3 Roped hydraulic type elevators shall not be permitted or installed.

60.4 Basement traction elevators shall not be permitted.

60.5 If hydraulic elevators are utilized, consideration and preference shall be given to holeless type (i.e. not requiring excavation to install) employing single stage, direct acting piston/cylinder configurations). Hydraulic elevators shall be limited to facilities with no more than three levels and a maximum vertical rise of 8.25 meters and shall only be used where adequate justification is presented for acceptance by the Manager, Contracts and Optimization and/or the HA

61 ELEVATOR CONFIGURATION

61.1 Elevators for public use shall be configured with platforms that are wider than they are deep, with centre opening doors, to facilitate efficient loading and unloading.

61.2 Size of Elevators

.1 Elevators shall be sized in accordance with actual needs for the HCF based on the intended purpose. This shall include consideration for special clinical requirements including but not limited to bariatric, trauma, helipad or other special requirements.
.2 Whenever possible, elevators shall be selected from industry standard dimensions. Custom sizing shall only be accepted by the HA in exceptional circumstances.
.3 Cab heights shall be 3048mm (10’-0”) clear to underside of ceiling.
.4 Door type and size shall be matched with the platform size and orientation.
.5 Where a facility has both Service and Public elevators, and the Service elevators are designated for the transportation of patients in beds, the team shall also consider sizing the Public elevators to accommodate the flow of patients in beds for redundancy and to ensure clinical and facility options in the case of failures, repairs or breakdowns.
.6 In most applications, whenever possible the elevator cab should be sized to accommodate HFC beds.

62 COMMISSIONING AGENT

62.1 HA may directly procure a Commissioning Agent for all projects. All consultant and construction teams shall provide the requirements set out by the Agent and this document.

63 AUDITS

63.1 Near or at the end of the warranty period for each elevator in a project, a full audit shall be completed to establish the current condition of the elevator. Every component of the elevator shall be comprehensively assessed and reported to the Manager, Contracts and Optimization. Where there are deviations in overall performance of the equipment or maintenance of the elevators or machine room, the Elevator Contractor shall remedy the issues and the elevators shall be re-audited to establish an approved baseline condition. The audit will follow a procedure established by the HA and a pre-audit conference shall be attended by all parties.

PART 4 – MODERNIZATION OF EXISTING ELEVATORS

64 INTRODUCTION

64.1 The purpose of this section is to provide guidelines for the modernization of existing elevators in existing HCFs.

64.2 The objective of an elevator modernization is to provide safe, reliable, sustainable and consistent elevator performance for a minimum of 25 years from the time of completion of the elevator project.

64.3 The scope for modernization of existing elevators shall be determined on a case-by-case basis. Scope shall be defined clearly by the elevator consultant, approved by the Manager, Contracts and Optimization or his designate Contract Manager, Facilities and a specification prepared for tender or competitive bid by the elevator consultant.

64.4 Complete replacement of elevator equipment may be required in certain locations in the HA facility portfolio.

64.5 Where any new components are required, the design specification shall be prepared per “Part 2 – Technical Requirements” of this document.

65 PERMISSION TO WORK AT EXISTING FACILITIES

65.1 Five(5) days’ notice of any work that is to be undertaken at a facility, including investigations and inspections, shall be notified to the Project Manager for their approval and the approval of key stakeholders which include the HFC FMO Site Manager and Contract Manager, Facilities.

65.2 No work shall commence on site without the prior approval of the Project Manager.

65.3 Where input is required from facility stakeholders (e.g. security, fire alarm etc.) the vendor shall provide a detailed account of their expectations of the work required, the start time and duration of the work and any affect the work may have on the facility. If necessary, alternate circulation routes shall also be proposed with the request for permission to perform the work.

66 RENEWAL PROCESS – WORKING IN EXISTING FACILITIES

66.1 Where elevator renewal projects are required in existing buildings, the project must adhere to all requirements of infection control requirements as listed in CSA Z317, in addition to any site specific requirements mandated by the facility.

66.2 It is the responsibility of the Contractor to ensure all standards in this document required by each facility are strictly adhered to, particularly in areas that impact at-risk patients.

66.3 Construction methods, work zones required and scheduling of disruptive work shall be reviewed and agreed with all key Project stakeholders, prior to the implementation of any work on site.

66.4 All Project team members shall note the sensitive nature of working in a live HCF where most occupants are either vulnerable or in a life threatening circumstance due to illness or injury, or there is treatment in those who are vulnerable due to illness or injury and/or their close friends and family attending at HFCs.

66.5 Safety, infection control and deference to site users shall be the top priorities at all times when working in a live HCF environment and shall be strictly enforced by the Project Manager.

67 INFECTION CONTROL PLANNING DURING CONSTRUCTION

67.1 Ante-rooms shall be provided to all construction zones. Pre-fabricated ante rooms shall be utilized to minimise site construction in vulnerable areas.

67.2 Specific infection control requirements for each HCF shall be included in the project specification, with critical areas emphasised to ensure clear understanding and implementation by the contractor. Requirements shall be determined as follows:

.1 The elevator consultant shall prepare a project scope outline for presentation to the Infection Control team at the project HCF, clearly marking affected areas on drawings.
.2 Estimates of construction duration in affected areas shall be provided.
.3 The Infection Control team shall have a period of two weeks to review the scope and affected areas, and to provide their specific site requirements for infection control for the project.
.4 The site specific requirements for infection control shall be included in the tender for construction services.

67.3 Contractors providing infection control measures during construction shall meet the following requirements:

.1 The site superintendent shall have a minimum of three (3) projects experience in the delivery of construction projects in a healthcare environment requiring infection control measures.
.2 The site superintendent shall provide a minimum of three references from previous projects successfully delivered, with a minimum of two references from the infection control officers for the project facility.
.3 The site superintendent shall be the same individual throughout the duration of the project. Where a change is unavoidable, the contractor shall provide continuity of service, additional training and additional reporting until the HA is satisfied that the new site superintendent is fully informed and in control of the project requirements. No additional costs shall be charged by the contractor for changes in their personnel.
.4 Weekly reporting, including photographs of all infection control measures, shall be provided by the contractor to the Project Manager for HA for the duration of the project.

68 MODERNIZATION SCOPE

68.1 The decision to modernize elevator equipment shall be based on the following criteria, which shall be weighted differently and appropriately to each HCF:

.1 Critical ranking of the elevator for facility usage (critical, high, normal, low)
.2 Age of equipment and components
.3 Quality of the original elevator equipment
.4 Condition of existing equipment and components
.5 Availability of spare parts to replace existing equipment or components if they are retained
.6 Ride quality objectives
.7 Reliability of the equipment
.8 Ease of long term maintenance and availability of parts

69 ELEVATOR MACHINES

69.1 Where geared machines are being considered for replacement, an alternate gearless machine equipment option shall be considered.

69.2 A report on the average power consumption of the geared versus gearless options shall be provided for review by Manager, Contracts and Optimization.

69.3 If existing machines are retained they shall be refurbished as follows:

.1 At a minimum, the machine shall be serviced in accordance with sentence 8 of TSBC Directive D-L4 100311 2 as follows:

h) Cleaned to ensure safe and proper operation, including but not limited to residual pads, linings, pins, springs, sleeves, discs.
i) A brake marking plate must be provided.
j) The brake setting and method of measurement must be permanently and legibly marked on the driving-machine brake.

.1 Any worn parts must be replaced and tested.
.2 The machines shall be:

- Thoroughly cleaned and painted.
- Flushed and replaced with new gear oil
- Have the seals replaced where leaking
- Any adjustments made to have a proper gear mesh between the crown and worm gear.
- The machine shall be painted, use a contrasting colour for components that rotate such as the main drive sheave as outlined in 15.6
- Stencilled with the elevator name and TSBC number

.1 Driving machine sheave rope retainers shall be provided for seismic requirements in accordance with 8.4.3.1 of the B44-07 Safety Code.
.2 New machine isolation pads of equivalent properties of the original equipment manufacturer shall be provided.

70 ASCENDING CAR OVERSPEED AND UNINTENDED MOTION PROTECTION

70.1 A system and associated devices necessary to provide ascending car overspeed and unintended motion protection for the elevator shall be provided.

70.2 Pre-approved products include a Hollister-Whitney Rope Gripper or equivalent.

70.3 The device shall be mounted directly to the elevator machine beams and an engineered drawing must be provided, and the installation must be in accordance with the submitted plans.

71 HOIST ROPES

71.1 Hoist ropes shall be replaced when elevator machines are replaced.

71.2 The hoist ropes shall match the original manufacturer specifications for type, diameter and rope lay, and new rope shackles shall be provided.

72 GOVERNORS

72.1 Governors that are not equipped with overspeed switches shall be replaced.

72.2 Governors that meet all current code requirements and remain in good operating condition shall be retained upon review on a case-by-case basis.

72.3 Where governors are located in the overhead and are not self-resetting, these shall be replaced with self-resetting governors.

72.4 When existing governor tension sheaves are retained, the bushings shall be cleaned and lubricated as part of the project to restrict acoustical issues and limit maintenance requirements.

72.5 All governors shall be calibrated to trip the overspeed switch and drop the mechanism that actuates the car safeties, in accordance with the contract speed and code requirements.

73 ELEVATOR DRIVES

73.1 Variable Voltage Drives with generators shall be replaced with AC Variable Frequency Drives.

73.2 Regenerative drives shall be considered on gearless applications and on geared applications that are 350 feet per minute and 8 stops or more.

74 HOIST MOTORS

74.1 Hoist motors shall be replaced unless justifiable evidence and reasoning to retain is presented which shall be considered.

74.2 New AC motors shall be provided to match the characteristics of the new AC Variable Frequency Drive being provided.

74.3 Motors shall have invertor spike resistant (ISR) windings.

74.4 The motor shall be sized accordingly to match the speed and capacity required to meet elevator performance requirements.

74.5 The motor shall be aligned with the existing machine with care and attention to accurate tolerances. The connection between the motor and machine shall be installed and commissioned to eliminate acoustical and vibration issues, and to extend the life of the equipment.

75 CONTROLLERS

75.1 The existing controllers shall be replaced with new, non-proprietary microprocessor control systems.

75.2 The controller shall have all of the operational capabilities to meet the requirements in these specifications as outlined in “Part 2 – Technical Requirements” of this document. Thermal potential and machine room environment shall be controlled appropriately to the equipment supplied.

75.3 All existing controller(s) mounts shall be seismically restrained.

75.4 Thermal monitoring of elevator systems shall be provided, with automated alarm to the facility 24/7 monitoring station or as otherwise designated by the HFC, FMO and HA.

75.5 Minimum operating range of all elevator equipment shall be 90 degrees Fahrenheit for 5 hours.

76 CLOSED LOOP CONTROL

76.1 Motion control systems shall be equipped with closed loop control.

76.2 Closed loop feedback power controls shall be arranged to continuously monitor the actual elevator speed signal from the velocity transducer and compare it with the intended speed signal to verify proper and safe operation of the elevator. The power factor shall remain continuously at 95%.

77 MACHINE ROOM FLOOR PATCH AND PAINT

77.1 All holes shall be repaired. In addition to structural and other design requirements, special attention shall be given to providing a smooth, seamless floor and wall finish.

77.2 The machine room floor shall be cleaned, prepared and painted with a durable white or grey semi-gloss paint.

78 SEISMIC MOTION SENSOR

78.1 Where required by code, provide and mount on a solid appropriate wall surface in the elevator machine room, a device to detect seismic activity and send a signal to the elevator controller.

79 HALL DOOR EQUIPMENT

79.1 Door Interlocks

.1 Replace existing door interlocks with new interlocks and new wiring in accordance with the most recent requirements of the B44 Safety Code for Elevators.
.2 Where door locks are of good original quality, effort shall be made to retain instead of replacing. Examples are Otis 6940 Door Interlocks.

79.2 Hall Door Tracks and Redundant Retainers

.1 The existing door tracks and door retainers shall be retained if possible.
.2 If there is notable damage to the door tracks they shall be replaced
.3 All hall sills shall be cleaned for the full width of the sill and in like new condition or replaced.
.4 Otis J tracks shall be replaced with new conventional tracks and all hall door rollers shall be replaced.

79.3 Door Closers

.1 Weighted and spring type closers shall be replaced with new Spirator Door Closers from Smartork or similar approved.
.2 Sill type closers shall be retained unless they are worn or proven problematic through the maintenance contract.

79.4 Drop Key Access

.1 Provide drop key access at each hall door.
.2 Each door interlock shall be equipped with means to allow the door lock to be lifted with a drop key device.
.3 All holes in each hall door shall be filled with a sleeve that is positively tightened such that it cannot be removed.

79.5 Door Hardware, Rollers, and Linkages Renewal

.1 The intent of a modernization is to renew the door equipment and hardware to new/near new operational condition.
.2 Replace all damaged or worn astragals on each hall door panel.
.3 All cab sills shall be replaced.
.4 Replace all hall door rollers

79.6 Door Restrictors

.1 Unitec Folding Door Restrictors shall be installed.

80 TOP OF CAR INSPECTION AND STOP SWITCH

80.1 Where existing top- of-car inspection stations are not code compliant, a new top-of-car inspection station shall be provided, conveniently located for safe operations and access while performing maintenance from the car top.

80.2 The inspection station shall be designed with redundant and protected buttons in accordance with elevator safety code requirements.

80.3 If the inspection station cannot be mounted within easy reach from the lobby, an auxiliary stop switch shall be provided that is within easy reach from the elevator lobby. The stop switch shall be wired in series with the stop switch on the top of car inspection station.

81 CAB AND COUNTERWEIGHT GUIDES

81.1 The replacement of guide rollers on cars and counterweights are to be determined on a case by case basis. Typically, older roller guides that do not have provisions for the adjustment or spring tension in the rollers shall be replaced.

81.2 New Roller Guides to the car and counterweight shall be provided in most cases. Elsco Model B (or similar approved) is the minimum quality permitted for the car and Elsco Model D (or similar approved) is the minimum quality permitted for the counterweight.

81.3 Where additional seismic supports are required, cab upper and lower guiding member position restraints shall be provided in accordance with 8.4.5.1 and 8.4.7.2.1 of the B44 Safety Code.

82 CAB COUNTERWEIGHTS

82.1 Typically, counterweight frames shall be retained when modernizing elevators. Any new weight added to the counterweight shall be suitably fastened to prevent weights from slipping free of the counterweight and to eliminate any acoustical issues due to rattling weights or fasteners.

82.2 Upper and lower guiding member position seismic restraints shall be provided in accordance with 8.4.5.1 and 8.4.7.2.1 of the B44-07 Safety Code.

83 HOISTWAY FLOOR MARKINGS

83.1 If not already provided, each landing shall be identified from the inside of the hoistway by marking the floor level on the inside of each hall door panel at the top and bottom with a stencil a minimum of 4” tall.

84 SAFETY PLANK

84.1 Typically, unless the speed or capacity of the elevator is changing or there is a mechanical reason that prevents the re-use of the safety plank, it shall be retained, cleaned and refurbished in addition to the actuating rod and safeties.

85 BUFFERS

85.1 Typically, existing buffers shall be retained. For oil buffers, buffer fluid shall be flushed and replaced.

85.2 Where oil buffers are provided, a buffer return switch shall be installed if not already in place.

86 PIT STOP SWITCH

86.1 All pit stop switches that are not protected from accidental actuation shall be replaced.

86.2 Additional pit stop switches shall be provided when the main switch cannot be actuated from the pit. For example, elevators with exceptionally deep pits that are only equipped with one pit stop switch.

87 PIT LADDER

If not already provided, the elevator contractor shall provide a pit access ladder.

88 APRON (TOE) GUARD

88.1 Where achievable, new sheet metal apron guards shall be provided to replace the existing apron (toe) guards providing as much protection as possible below the car sill.

88.2 New apron guards shall extend 48” below the car sill, unless limited by the existing pit depth and car over-travel.

88.3 The apron guard shall be fastened on both sides to prevent deflection when loaded horizontally from the lobby.

89 SEISMIC REQUIREMENTS

89.1 Where deflector sheaves are located in the overhead, provide deflector sheave rope seismic retainers in accordance with 8.4.3.1 of the B44-07 Safety Code for any overhead deflector sheaves.

89.2 A counterweight displacement detector device shall be provided if the counterweight has been displaced from within the guiderails.

.1 The counterweight displacement detector device shall be connected to the elevator controller and cause the elevator to slow down, stop and level to the floor where the car travels away from the displace counterweight.

90 CAB INTERIOR VENTILATION

90.1 Where ventilation is not already provided, a new ventilation fan shall be installed with the capacity and design to provide adequate quiet air flow through a HEPA filter (MERV14 or as approved by HCF) into the cab occupancy space so the cab is pressurized and air is vented out through the required elevator code floor and ceiling openings into the elevator shaft.

90.2 Existing ventilation shall be redesigned to function as outlined above in like-new operating condition or replaced where required.

90.3 A fan grill cover shall be provided and painted to match the ceiling of the cab.

91 HOISTWAY ACCESS KEYED OPERATED SWITCHES

91.1 Hoistway access shall be provided at the top and bottom landings regardless of the speed of the elevator.

.1 The keyed switch shall be mounted in the sight guard or entrance jamb of the door at each respective landing. They shall not be installed in the hall station.

91.2 The contractor shall be responsible for any cutting and patching required for new fixtures and to make-good the existing elevator entrance finishes.

92 PANEL FOR EMERGENCY PERSONNEL

92.1 Where required by Code, or when considered necessary by the HCF, a fixture shall be provided within close proximity of the main floor elevator lobby that shall contain the following:

.1 A remote telephone and handset that can call directly into every elevator hands free phone;
.2 A two position keyed switch for fire fighter operation;
.3 An illuminating indicator to advise emergency personnel that elevators are set on recall-operation.

93 HALL DOOR FRAMES AND ENTRANCES

93.1 Existing entrances and frames that are not finished in stainless steel shall be fully wrapped up to at least 40 inches off the floor to protect existing finishes and include all floor and code required markings and barrier free access information.

94 HOUSEKEEPING

94.1 All elements of the cab, machine room and any areas impacted by construction activities shall be thoroughly cleaned and all debris removed prior to final inspections of any elevator modernizations.

94.2 Where alterations to existing areas are required, all impacted areas shall be made good and returned to previous or better condition.

PART 5 – OPERATIONS AND MAINTENANCE

95 INTRODUCTION

95.1 Part 5 of these guidelines is intended for use in determining operations and maintenance requirements for elevators, new and modernized.

96 PERFORMANCE REPORTING

96.1 Performance reporting information shall be available and provided upon request for all elevators after elevator commissioning by Manager, Contracts and Optimization, Facilities Manager or their designates.

96.2 Where an entrapment or elevator shut-down occurs, provision shall be made to notify the Facility Manager, the Manager, Contracts and Optimization and/or appointed delegate(s) with a priority communication.

97 AUDIT REPORTING

97.1 Following the completion of project scope for each elevator modernization in a project, a full audit shall be completed to establish the new baseline condition of the elevator. Every component of the elevator shall be comprehensively assessed and reported to Manager, Contracts and Optimization.

98 WIRING SCHEMATICS

98.1 Wiring Schematics shall be provided for each elevator control system provided.

98.2 The Schematics shall be:

.1 “As built” and shall match the actual wiring of the controllers.
.2 Complete and cover all components of the elevator without any exceptions.
.3 Specific for the actual elevator
.4 Submitted in both hard copy (2 copies, full size) and electronic (.pdf) format

99 MANUALS

99.1 The OEM Manual and Owner’s Manual shall be provided for each elevator and/or specific component included in the scope of each project.

99.2 The Owner’s Manual shall include all procedures and protocols required to operate all installed equipment, including but not limited to the following:

.1 Simple description of the reset procedure for automatic emergency recall operation
.2 A description of the operation of all special features including but not limited to Medical Emergency Operation, Priority Service, Standby Power testing and independent service etc.
.3 What HCF staff can check and do before they place a call to the elevator contractor for service.

.4 Routine housekeeping procedures that are recommended by the elevator contractor to sustain the equipment shall be included such as cleaning procedures for hall sills, cab sills, door detector edges, stainless steel finishes and cab/hall call buttons.
.5 All lighting manuals shall be provided in the Owner's Manual.
.6 Submitted in both hard copy (2 copies in separate hard cover binders with labelled section dividers) and electronic (.pdf) format

99.3 The OEM Manual shall include all information required to install, service, maintain, repair and replace all components of the elevator and its operations.

99.4 The OEM Manual shall include:

.1 A detailed spare parts list for all elevator components including but not limited to control boards, hall door rollers, top of cab inspection, door operator, roller guides, lighting specifications, hall and cab call buttons;
.2 Details of all fault codes and diagnostic/troubleshooting instructions;
.3 Instructions for mandatory testing including but not limited to brake tests, governor tests and other tests that are required, in accordance with elevator safety code regulations;
.4 Emergency backup power procedures;
.5 Fire alarm testing procedures;
.6 Submitted in both hard copy (1 copy in a hard cover binder with labelled section dividers) and electronic (pdf) format.

100 WARRANTY REQUIREMENTS

100.1 Contractor obligations during the warranty period shall be under the current and required VCH Scope of Work contract documents referenced in the Appendix at the end of this document.

101 MAINTENANCE TRAINING

101.1 During construction, training shall be provided to all affected vendors to address temporary conditions e.g. alternate fire procedures, alternate security/infant theft procedures etc.

101.2 When turning over an elevator or group of elevators to the HCF, the local building operators and appropriate staff shall be provided an orientation of the various elevator operations and any keyed switches. These features include and are not limited to automatic emergency recall and reset procedures, medical emergency operation, and priority recall operation.

.1 Training sessions shall be video recorded for use by personnel not available at the training sessions.

102 CHECKLISTS

All construction team members, including all consultants and contractors, will be required to complete project checklists as part of project deliverables to the Project Manager for quality and assurance monitoring.

APPENDICES

These appendices are provided as supplemental information to the guidelines. Numbered references correspond to their host sections in the main body of this document.

A1 – Introduction

1.2 – Technical Guidelines Deviation Submission

Documentation shall be provided with clause references to these Technical Guidelines for all deviations for approval to the Manager of Contracts, Facilities

A7 - Barrier Free Access

A7.1 Best practices for additional barrier free access shall include vertical switches mounted on the side and rear walls of the cabs that extend from the handrail to the floor to allow users to:

- Place cab calls without having to use their hands.
- Activate the hands free phone

The Blusson Building at Vancouver General Hospital is equipped with a good example of this type of barrier free access.

A13 – Vibration and Acoustical Isolation

The technical requirements require all elevator equipment in particular the elevator driving machines to be mechanically isolated from the rest of the building to prevent the transmission of noise through the building structure.

Suggestions to assist in the isolation of the machinery equipment can be found at http://www.vibra-sonic.com, where details describing the isolation of overhead traction machines are documented as guidance.

A21 Cab Operating Panels

Figure 1 shows key operating panel components and layout. Designs shall include clear instructions, latest technologies, and complement infection control measures effectively. This figure is **INDICATIVE ONLY** – final approved HFC design by the Elevator Consultant or Installer for the Project.

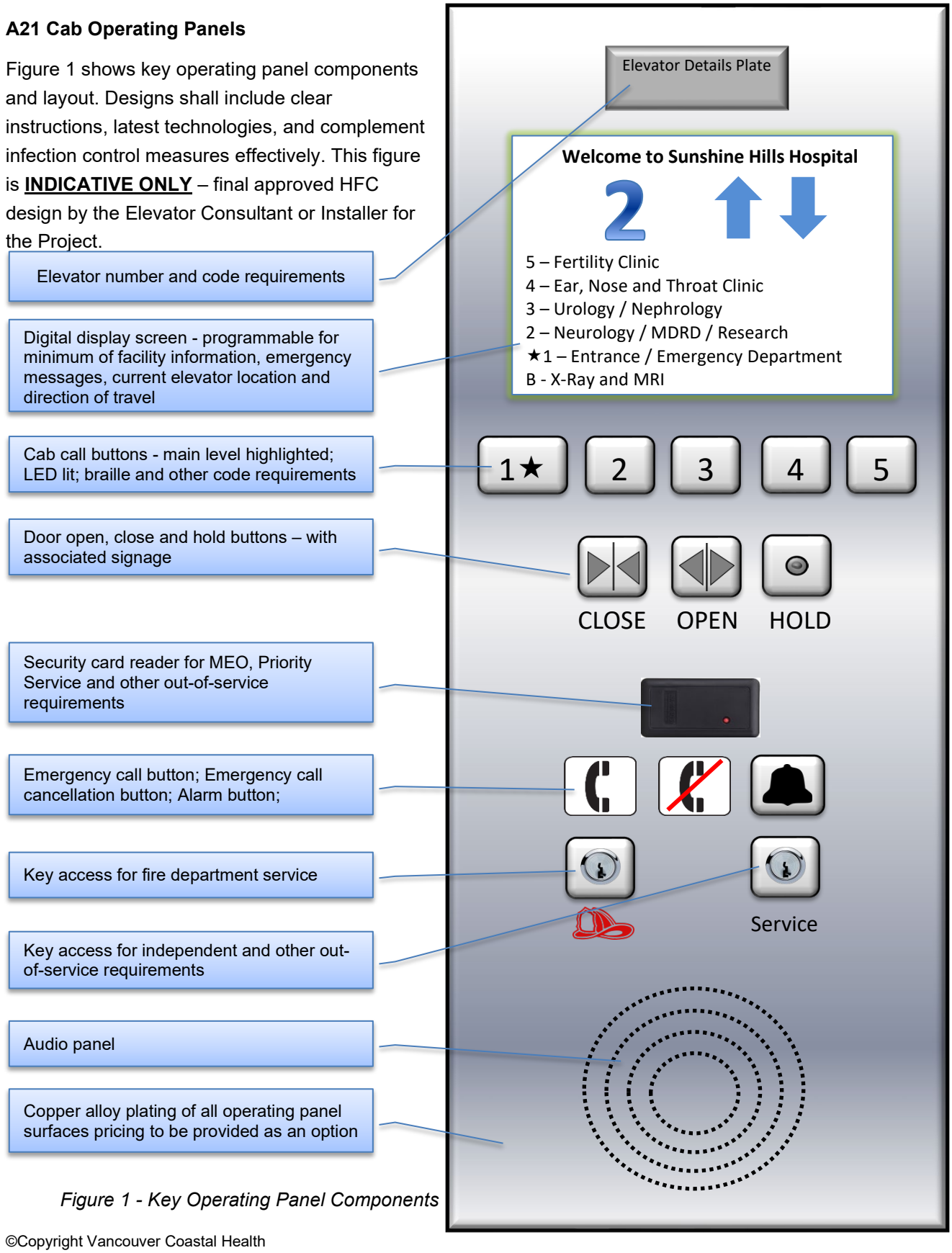

Figure 1 - Key Operating Panel Components

A28 – Cab Interior Finishes

The intent of the cab finishes design and specifications, as shown **INDICATIVELY** in Figure 2, is to:

a) Maximize patient comfort by avoiding direct lighting for patients lying on beds. All lighting fixture components requiring regular maintenance (e.g. bulbs) shall be replaceable from the inside of the cab, without the requirement to access the cab roof. LED lighting is preferred including strip lighting as outlined in Figure 2 or other configurations in line with approved elevator cab design.
b) Minimise the spread of infection that can occur when ceiling panels are disturbed for maintenance or repairs, by avoiding the requirement to access the cab roof from within the cab.
c) Minimise the spread of infection by limiting all joints, recesses, seams etc. of cab finishes, including floors, walls, ceilings, handrails, bumper rails, operating panels, lanterns etc.
d) Air intake rather than exhaust into elevator cab through a HEPA filter with a MERV 14 rating or HFC approved alternative.

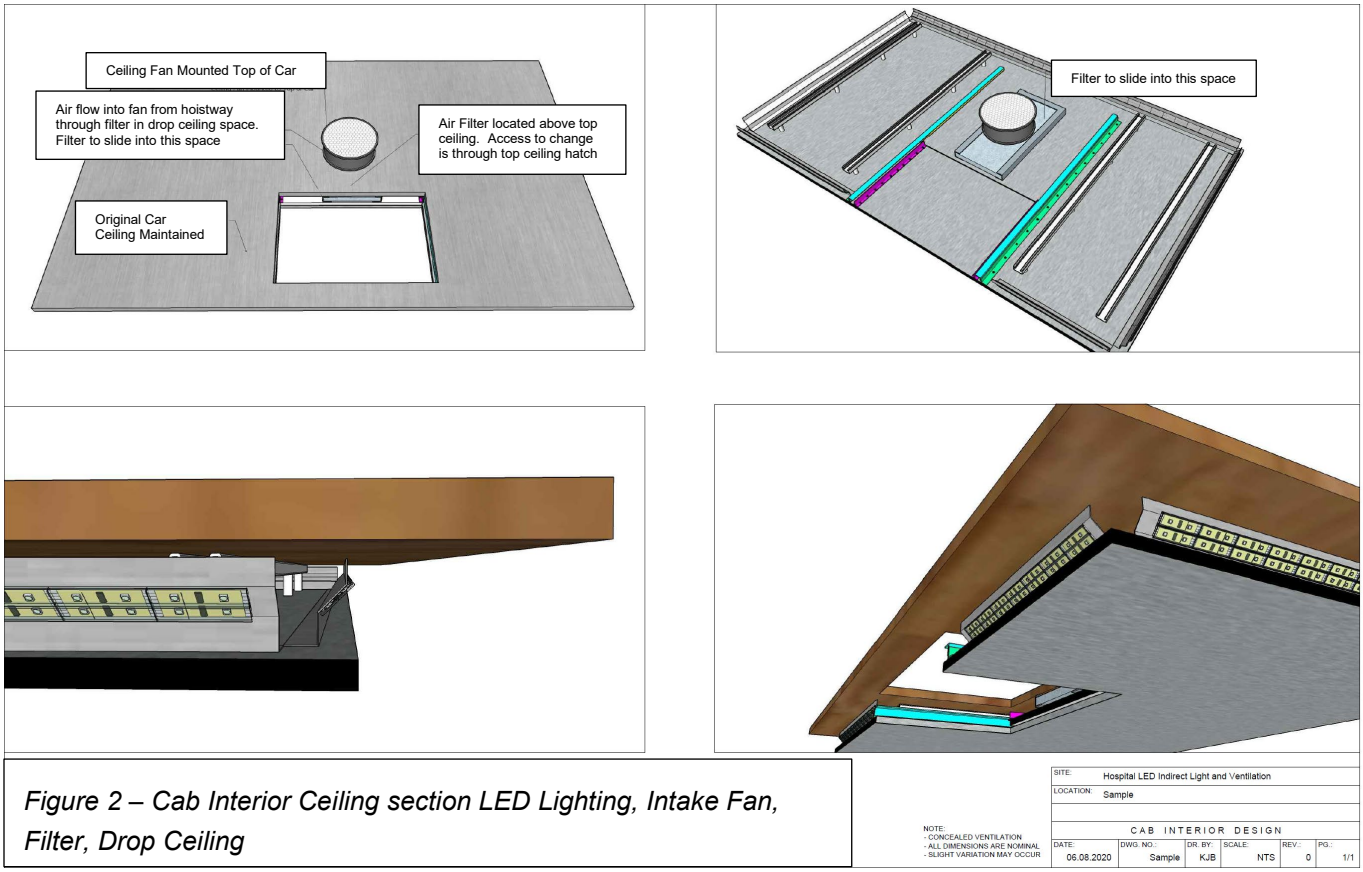

Figure 2 – Cab Interior Ceiling section LED Lighting, Intake Fan, Filter, Drop Ceiling

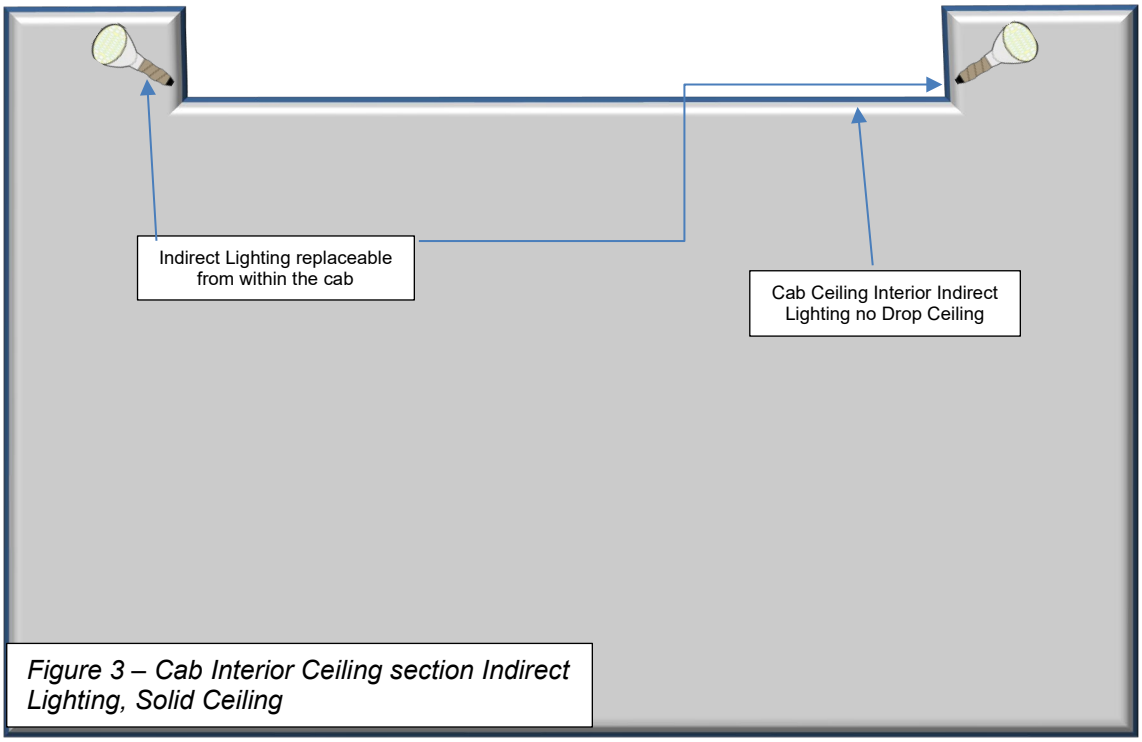

Figure 3 – Cab Interior Ceiling section Indirect Lighting, Solid Ceiling

A36 – Elevator Dispatching

A36.1 Calculations based on anticipated traffic movement shall be taken into consideration, rather than assumptions for overall building population.

For example, a floor with ambulatory patient day procedures may need to move more people that the actual static population counted at any given time.

As another example, 10 treatment rooms - where the average treatment time is 15 minutes - might have a population of 24 people at peak periods. Traditional calculations would take 12% of 24 people and move 2.88 people every 5 minutes. In reality, every 15 minutes you will have 10 patients coming in with one person accompanying them and the same amount leaving. This amounts to 40 people in 15 minutes, which is 13 people in a 5 minute interval, which is larger than the 2.88 people calculated with traditional methods.

A36.2 Dwell Times

For public elevators, the door dwell times shall be as follows: (latest version of CSA Z8000)

- Nominal cab call dwell time shall be 3.5 s.
- Nominal hall call dwell time shall be 5.0 s.
- Nominal nudging initiation time shall be 20.0 s.

Dwell times shall be adjusted to suit particular HCF requirements as required for specific purpose.

A42 – Medical Emergency Operation

A42.1 When Medical Emergency Operation Stage 1 has been initiated, the elevator shall respond as follows:

a) Upon receiving a Medical Emergency signal, the elevator group control system shall select the elevator available in the shortest time, cancel all existing hall and cab call demand and send the cab directly to the MEO level.
b) An audible signal shall be provided in the cab selected. This signal shall sound to alert any passengers to immediately exit the elevator at the next landing.
c) An illuminating Medical Emergency notice shall be provided in the cab(s) selected that reads “Medical Emergency, Please Exit” or similar. The sign shall illuminate for the duration of the MEO.
d) A hidden indicator shall be provided in hall lantern stations to illuminate “Medical Emergency” when that cab has been selected and entered into MEO operation.
e) Hall lanterns with indicators shall be provided at all landings to advise passenger and emergency personnel that the elevator is on MEO operation.

A42.2 When Medical Emergency Operation Stage 2 has been initiated, the elevator shall respond as follows:

a) Elevators designated as MEO shall be equipped with a two (2) position momentary keyed switch to initiate MEO operation inside the cab labelled “OFF” and “ON”. The OFF position is the neutral position where the key can be inserted and removed. Turning the key momentarily to “ON” shall initiate MEO within the cab.
b) When the elevator has arrived at the required MEO landing, they shall have five (5) seconds to initiate MEO operation within the cab before it is automatically restored to group operation.
c) The Code Team shall initiate the MEO operation in the Cab by rotating the switch to the MEO “ON” position.
d) Upon actuation of a cab call, the elevator shall proceed directly to the target floor.
e) The elevator shall be automatically restored to normal operation once the elevator has reached the destination called by Code Team. All audible and visual indicators shall be extinguished.
f) If extra time is required by the Code Team, or if the elevator needs to remain at the designated floor, then independent service shall be initiated.
g) Cab doors shall operate in normal mode during an MEO, thus the door hold button can be used to extend the time if required.

A41.3 Cancelling MEO Operation - MEO Operation can be cancelled in the following ways:

a) MEO Operation shall be cancelled at the hall station where MEO was initiated by rotating the key to the cancel position. This shall cancel the MEO operation if the elevator has not yet arrived at the landing.
b) If a proximity card reader system is used, the MEO operation shall be cancelled by swiping the hall call proximity reader a second time.
c) The cab shall automatically time out and return to normal group operation and all audible and visual indicators for MEO operation will stop and extinguish respectively.

A42.4 MEO Operation Identification and Marking

a) Key orientation shall have the neutral “OFF” position at the 12 o’clock position. The key shall rotate 90 degrees clockwise to the “ON” position to initiate Stage 2 MEO operation.
b) The MEO Operation initiation devices shall be provided with a blue ring or collar.
c) The MEO Operation initiation devices shall be labelled with “Medical Emergency” blue, or white on blue.
d) The MEO Operation initiation devices shall be engraved with blue infill or white on blue, and shall state “MEDICAL EMERGENCY OPERATION”.
e) All keyed switches used to initiate Stage 1 or Stage 2 Medical Emergency Operation shall have their positions labelled in BLUE.

A42.5 MEO Operation and Automatic Emergency Recall

a) If Automatic Emergency Recall Phase 1 is initiated when an elevator is in MEO Stage 2 operation, that elevator shall recall in accordance with Automatic Emergency Recall operation, once the Medical Emergency Operation has been completed or cancelled.

A42.6 MEO Operation in banks of Multiple Elevators

a) For a bank of elevators, all elevators shall be capable of operating in MEO at one time. If an MEO is initiated while an elevator is currently in Medical Emergency operation, the HCF staff shall be able to call another elevator in the same bank for MEO operation.

QUALIFIED ELEVATOR CONTRACTORS ONLY

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TK ELEVATOR CONTRACT C03593

RICHMOND ELEVATOR CONTRACT C03594

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ABOVE ELEVATOR CONTRACTS REQUIRED FOR INSTALLATION, WARRANTY AND SERVICE

–

TO PRE-QUALIFY CONTRACTORS FOR ELEVATOR INSTALLATION OR MODERNIZATION UNDER REQUIRED CONTRACTS AND THESE GUIDELINES CONTACT:

VANCOUVER COASTAL HEALTH

MANAGER OF CONTRACTS & OPTIMIZATION, FACILITIES, REAL ESTATE AND STRATEGIC DEVELOPMENT INITIATIVES