SCHEDULE 3

DESIGN AND CONSTRUCTION SPECIFICATIONS

TABLE OF CONTENTS

SCHEDULE 3

DESIGN AND CONSTRUCTION SPECIFICATIONS

1. INTERPRETATION

1.1 Defined Terms

In this Schedule, in addition to the definitions set out in Schedule 1 of this Agreement:

"**Building**" means the building to be constructed on the Site under this Agreement, and includes all additions and improvements thereto from time to time;

"**Campus**" means all of the lands on which the RJH is located;

"**Central Services**" means steam, electricity and medical gases supplied by the Authority;

"**Communication Systems**" has the meaning set out in Section 14.1(a) of this Schedule;

"**Coronation Annex**" means the coronation annex identified on the Site Plan;

"**CPTED**" means Crime Prevention Through Environmental Design;

"**Data Room**" means the website established by the Authority and containing documents related to the Project;

"**Diagnostic and Treatment Building**" means the diagnostic and treatment building identified on the Site Plan;

"**End-Use Equipment**" has the meaning set out in Section 15.1(a)(3) of this Schedule;

"**Heritage Chapel**" means the heritage chapel identified on the Site Plan;

"**Indicative Design**" has the meaning set out in Section 4.2;

"**Information Technology and Telecommunications Infrastructure**" has the meaning set out in Section 15.1(a)(2) of this Schedule;

"**Japanese Garden**" means the Japanese garden identified on the Site Plan;

"**Medical/Surgical Inpatient Units**" or "**Medical/Surgical IPUs**" has the meaning set out in Section 9.1 of this Schedule;

"**Mental Health Inpatient Units**" or "**Mental Health IPUs**" has the meaning set out in Section 10.1 of this Schedule;

"**Parking Garage**" means the parking garage identified on the Site Plan;

"**Pemberton Heritage Pavilion**" means the Pemberton heritage pavilion identified on the Site Plan;

"**PICU**" has the meaning set out in Section 10.2(b) of this Schedule;

"**Program Requirements**" has the meaning set out in Section 4.1 of this Schedule;

"**Summary of Accommodations**" has the meaning set out in Section 4.2 of this Schedule;

"**TAB**" means testing, adjusting and balancing; and

"**West Block**" means the west block identified on the Site Plan.

2. GENERAL

2.1 Standards

General Standard of Design and Construction

(a) Project Co will undertake all Design and Construction:

(1) in accordance with the standards set out in this Schedule;

(2) in compliance with all applicable Laws;

(3) having regard for the concerns, need and interests of:

(A) all persons who will be Facility Users; and

(B) all Governmental Authorities;

(4) in accordance with Good Industry Practice; and

(5) to the same standards that an experienced, prudent, and knowledgeable long term owner of a first class health care facility in North America, whether to be operated publicly or privately, would employ.

(b) If more than one of the above standards is applicable then the highest of such standard will apply.

(c) Without limiting any of the above and notwithstanding any other provision of this Schedule Project Co will undertake all Design and Construction:

(1) to at a minimum meet the requirements of the BC Building Code; and

(2) in compliance with codes that are not specifically referred to in this Schedule if required to meet Good Industry Practice or other standards set out above.

(d) If Project Co wishes to make reference to a code or standard from a jurisdiction outside of Canada then Project Co will demonstrate to the Authority's satisfaction that such code or standard meets the requirements of this Schedule.

2.2 Output Specification

(a) This Schedule is written as an output specification for the purpose of defining what Project Co must achieve in the Design and Construction.

3. ARCHITECTURAL DESIGN PRINCIPLES AND REQUIREMENTS

3.1 Site Conditions

Project Co will, in undertaking the Design of the Facility:

(a) integrate the following existing elements:

(1) the Pemberton Heritage Pavilion;

(2) the Heritage Chapel; and

(3) the Japanese Garden;

(b) provide smooth transitions between the Site and adjacent buildings, open space and public sidewalks;

(c) provide appropriate access to the Site to meet the needs of ambulances to the Site for emergencies, staff and visitor traffic, and service and delivery vehicles including:

(1) minimize general and service vehicle traffic interference with ambulance and other emergency vehicle access to the Site; provide for the functional separation of traffic for emergency vehicles, visitors and staff, and service vehicles; and

(2) maximize access to the Facility and provide a drop-off area with no less than five temporary-parking vehicle spaces outside of the traffic flow;

(d) consider the impact of the Facility on adjacent neighbours and land uses including, where practical, preserving visual privacy and sunlight for adjacent properties;

(e) consider the micro-climatic effects of parking, walkway, building location and Facility entrance orientation on patient, staff and visitor comfort and safety; and

(f) provide well-lit bicycle locking/parking facilities for a minimum of twenty-four bicycles.

3.2 Interior Design

Project Co will undertake the Design of the interior of the Facility as follows:

(a) incorporate the principles of evidence-based design;

(b) maximize opportunities for access to natural light and views;

(c) employ materials and detail surfaces to absorb and minimize sound;

(d) conceal the clinical infrastructure wherever possible;

(e) maximize opportunities for patient empowerment through control of lighting, sound, décor (personalization) and daylight;

(f) create points of interest within a patient care unit by varying colours, textures and lighting;

(g) avoid 'blank' hallways with solids at the end: provide views and/or direct or borrowed natural light;

(h) impart a residential feel;

(i) balance the openness required for patient monitoring with privacy considerations regarding confidentiality of patient information and with the security needs of staff at all hours of the day;

(j) design workplaces so that they are flexible and adaptable to change and promote patient and staff safety;

(k) respect processes, workflow and ergonomics in the design of workspaces;

(l) provide 'rest stops' and intuitive meeting points for patients and visitors to pause, rest, consult; and

(m) include suitable spaces throughout the Facility for the display of two- and three-dimensional art, donor recognition systems that provide appropriate lighting, power and data connectivity.

3.3 Staff Requirements

Project Co will undertake the Design of the Facility to consider the requirements of staff as follows:

(a) permit and facilitate economical and flexible staffing to meet the healthcare needs of the patients including:

(1) patient-lifting equipment;

(2) proximity between staff workstations and patient rooms; and

(3) support rooms such as clean and soiled utility rooms.

(b) consider that the staffing complement will consist of multi-disciplinary care teams including but not limited to nurses, physicians, rehabilitation therapists, clinical dieticians, pharmacists, social workers, pastoral care workers, students/interns/residents from a wide variety of healthcare education programs;

(c) permit the arrangement of functions on the units, while supporting the team in their relationship with their patients, to facilitate the creation of a 'team' environment for the

staff, even though they will spend much of their time in dispersed locations on the units; and

(d) accommodate the Equipment to create a positive and efficient work environment that is free of obstacles for staff and patients.

3.4 Technology

Project Co will undertake the Design of the Facility to utilize leading edge technology for the benefit of patients and staff.

3.5 Flexibility of Planning and Systems

Project Co will undertake the Design of the Facility to be able to accommodate future changes as follows:

(a) so that it is adaptable to change, including connections to the West Block or the Coronation Annex and eventual changes in use;

(b) so that all aspects of the Facility, including services distribution, building systems, footprint and mix of rooms, allow efficient, economical and minimally-disruptive physical and operational changes throughout the life of the Facility; and

(c) to allow for additions, deletions and relocations of services to clinical and non-clinical areas over the life of the Facility, including by consolidating risers and hubs in strategically accessible and expandable locations and planning appropriate closets, cabinets, chases and shafts for access and growth.

3.6 LEED Certification and Pacific Green

At a minimum, subject to Section 4.6 of Schedule 2 [Design and Construction Protocols], Project Co will undertake the Design of the Facility so that the Facility is constructed and certified to the Canada Green Building Council's Leadership in Energy and Environmental Design LEED Canada-NC 1.0 (including Addenda dated March 2007) Gold standard. It is the responsibility of Project Co to compile and submit the required documentation for certification.

In undertaking the Design of the Facility, Project Co will take into account a "Pacific Green" approach that emphasizes sustainability and environmental awareness. Pacific Green, as a core guiding principle for the Facility requires safer building products, safe working practices, energy, water, and equipment efficiency, low VOC emissions, education, and a commitment to public health through reduced waste volumes and toxicity levels. Project Co will under take the Design and Construction and services to consider the Green Guide for Health Care – Version 2.2, LEED EB (Existing Building) and current version of LEED for Health Care.

3.7 Bariatric Enabled

Project Co will undertake the Design of the Facility so that the Facility can effectively care for bariatric patients and will consider the design recommendations for a bariatric friendly hospital that are set out in "*Planning and design guidelines for bariatric healthcare facilities*" published by the American Architectural Institute.

3.8 Elder Friendly

Project Co will design the Facility as an elder friendly hospital. In undertaking the Design, Project Co will consider the design recommendations for an elderly friendly hospital that are set out in "Code Plus: Physical Design for an Elderly Friendly Hospital" published by the Fraser Health Authority.

4. PLANNING AND DESIGN

4.1 Program Requirements

Project Co will design the Facility to accommodate the following (collectively the "**Program Requirements**"):

(a) public spaces (lobby/atrium/washrooms/waiting areas) – see Section 6;

(b) retail space – see Section 6(a);

(c) external space (circulation, access, courtyards) – see Section 8;

(d) medical/surgical/specialized – see Section 9;

(e) mental health and addictions – see Section 10; and

(f) material resources – see Section 11.

4.2 Indicative Design and Summary of Accommodations

The Authority's architectural consultant, Zeidler Partnership Architects, undertook an indicative design of the Facility (the "**Indicative Design**") as part of the Authority's application to the City to re-zone the Site to permit the construction of the Facility. Drawings describing the Indicative Design are included in the Data Room.

The Authority and its consultants prepared an indicative summary (the "**Summary of Accommodations**") based to some degree on the Indicative Design, and but also reflecting consultations with users. The Summary of Accommodations lists types of rooms or space, number and size of rooms, and the contents of some rooms, and other significant design features which the Authority has identified as being necessary so that the Facility can accommodate the Program Requirements. A copy of the Summary of Accommodations is attached as Appendix 3A [Summary of Accommodations].

Project Co may, but will not be required to, use the Indicative Design or the Summary of Accommodations as a basis for its design of the Facility, but the Authority makes no representation as to the accuracy or completeness of any aspect of the Indicative Design or the Summary of Accommodations.

The Summary of Accommodations includes a column entitled "Preferences" that contains design features and building elements that the Authority would like to see included in the Facility but which are not mandatory. The column entitled "Minimum Requirements" describe design features and building elements that are mandatory and that Project Co is responsible to include in the Facility.

Project Co will be completely responsible for all aspects of the Design and Construction whether or not it uses all or any part of the Indicative Design Drawings and Project Co will be responsible to independently verify the accuracy of any information contained in or inferred from the Indicative Design or the Summary of Accommodations if Project Co uses any of such information in its Design.

5. TECHNICAL DESIGN REQUIREMENTS

5.1 Infection Control

In undertaking the Design, Project Co will:

(a) design the Facility to mitigate and prevent where possible, the spread of infection including via contaminated surfaces and airborne pathogens;

(b) select appropriate materials and use simple detailing leading to quality workmanship and ease of accessibility for routine cleaning and maintenance; and

(c) design the Facility to contain infections during an outbreak at the room level and at the level of a group, e.g. 18 rooms.

5.2 Building Envelope - Exterior Walls, Wall Systems and Roofs

Project Co will:

(a) complete all Design and Construction so as to prevent the accumulation and stagnation of rain, snow and dirt on the horizontal and vertical surfaces of the envelope;

(b) design exterior walls in accordance with the rain-screen principle; and

(c) ensure that materials and systems of the roof assemblies contribute to reducing heat gains and losses with minimal decline in performance over their expected lifespan.

5.3 Safety and Security

(a) Project Co will:

(1) utilize CPTED (Crime Prevention Through Environmental Design) principles along with workplace safety and security considerations:

"The proper design, effective use and maintenance of the built environment can lead to a reduction in the incidence and fear of crime and an improvement in the quality of life."

(2) minimize the visibility of security devices in patient care areas to reinforce the therapeutic nature and residential qualities of treatment spaces. In interior and exterior public spaces such as lobbies, reception and waiting areas, rest areas, access and egress points, security devices may be visible. Design the Facility and all outdoor areas with Facility Users safety and security in mind.

5.4 Disaster Preparedness

(a) Architectural

Project Co will design the Facility to include:

(1) features and flexibility for use in response to disasters and emergency situations including but not limited to an epidemic, chemical spill, extended power interruption, contamination of water supply and earthquake;

(2) a vestibule at the entry to each unit so that patients may be cohorted in a pandemic situation. If a unit or floor is isolated, a quiet room at the entry can be converted into a change area for staff to don Personal Protective Equipment (PPE); and

(3) space and the necessary infrastructure to support and serve as post-disaster communications and control centres for up to fifteen people on the top floor and the second-from-the-top-floor (possibly, but not necessarily, in conference/meeting rooms); each such room will require an appropriate locked closet for storage of emergency disaster equipment such as communications equipment.

(b) Post Disaster Mechanical Design:

Project Co will:

(1) design the mechanical piping and equipment seismically to post disaster methods as outlined in the BC Building Code;

(2) provide a domestic water inlet connection on the exterior of the Facility to allow for supply of water from a tanker truck (this water would be drawn through the domestic water booster station to feed the building systems);

(3) provide a sanitary sewer pump out connection on the exterior face of the Facility for connection to a sewage pump truck; and

(4) provide inlet connections on the exterior face of the Facility for medical gas connections (one inlet for each medical gas being supplied to the Facility).

5.5 Way finding/Signage

(a) Way finding

Project Co will:

(1) provide a simple configuration of the Facility's circulation systems and functions so that way finding is inherently easy;

(2) locate major destinations such as department entrances, along primary circulation paths for easy access, make waiting areas as open as possible to build comfort in way finding and design waiting areas to be distinct from circulation;

(3) provide significant recognizable, easily named and identified elements in key and easily found locations that can become ‘meeting points’ for patients and visitors; and

(4) design elevator and stair lobbies and public circulation routes to be distinct service routes from other non-public routes.

(b) Signage

(1) Overriding Principles

Project Co will:

(A) provide all signage required for building operations;

(B) provide highly visible and simple signage that is similar in size, appearance and location to the signage used in the Diagnostic and Treatment Building;

(C) design signage such that the materials, colours, letter fonts, sizes and other aesthetic and functional considerations conform to the overall way finding design system;

(D) provide signage that is resistant to graffiti and physical damage;

(E) use international symbols where and as applicable;

(F) orient building plan directories facing direction viewer is located;

(G) provide signage that directs visitors to departments, not just buildings;

(H) provide signage that is clearly visible day or night; and

(I) avoid multi-layered naming hierarchies.

(2) Authority Approval

(A) Project Co will:

(i) prior to installing any signage at the Facility, provide to the Authority’s Design Representative samples of such signage for approval by the Authority, such approval not to be unreasonably withheld;

(ii) not install any signage at the Facility until it receives approval from the Authority;

(3) Design Requirements

(A) Project Co will design the internal directional signs to include:

(i) a main directory, installed at the main public entrances to the Facility, that indicates the Facility in relation to the overall campus and the location of every area and department within the Facility that is accessible to the public;

(ii) a continuous trail from entrances to each of the reception/information points listed on the directories;

(iii) installation of signage at each point at which a directional decision is required; and

(iv) consistent terminology.

(B) Project Co will design door signage to indicate restrictions on entry and warn of hazard;

(C) Project Co will design door numbering:

(i) that is not obscured by the emergency systems and Code Blue system call;

(ii) to identify every space (e.g. rooms, alcoves, corridors and stairwells) in the Facility;

(iii) that is located in a consistent location for every room in the Facility;

(iv) that is consistent with the following room numbering protocol:

(iv).1 the Authority utilizes a consistent protocol for numbering rooms across the Campus;
(iv).2 each room has a unique identifier number;
(iv).3 rooms are numbered in a manner that reflects normal movement through a building;
(iv).4 labeling anticipates a person attempting to follow numbering along corridors in sequence;
(iv).5 blocks of numbers are periodically skipped to allow for future expansion of the numbering system if rooms are added through renovations;
(iv).6 when room(s) are contained within a large room off of a corridor (for example, the first door is numbered

PCC 012A and door(s) to rooms within the room are numbered PCC 012B, PCC 012C, etc.)
(iv).7 corridors require unique numbers which are two digits:
(iv).7.1 eg. PCC 01, PCC 02 (indicates basement) PCC 11, PCC 12 (indicates main floor)
(iv).8 stair wells utilize a single digit in each building:
(iv).8.1 eg. PCC 1, PCC 2, etc. (Note: labelled the same on all levels);
(iv).9 each room requires a number for service reasons and since many rooms will not have formal wall numbering panels, each door frame must be equipped with a lamacoid number plate approximately one inch high by two inches long, attached to the head of the door frame on the hinge side; and
(iv).10 as this numbering system is used for deliveries, repairs, fire alarm notifications, etc., it is important that room numbers be determined early in design and maintained following occupancy. Project Co will follow the same numbering system on design and construction documentation for all disciplines (architectural, mechanical, electrical, etc.).

(D) Project Co will ensure that external directional signage:

(i) clearly indicates Facility access for the public;

(ii) clearly indicates restrictions to 'after-hours' access and closest accessible entrance;

(iii) is well illuminated, backlit, reflective or high contrast and easily visible at night;

(E) Project Co will ensure that illuminated external Facility signage:

(i) clearly identifies the Facility;

(ii) minimizes light spillage;

(iii) indicates the accesses, parking and restrictions for various vehicle types, as required; and

(iv) includes at least one large exterior illuminated sign at Richmond and Bay streets to replace the existing illuminated sign at that location.

5.6 Accessibility

(1) Project Co will provide barrier-free accessibility throughout the Facility and across the Site except as specified otherwise in writing.

6. PUBLIC SPACES

Project Co will provide public lobby space that accommodates orientation and way-finding amenities, public telephones, public washrooms, seating, waiting areas, fund-raising and information displays, all in a pleasant and secure environment, including:

(a) natural light, a discrete area for breastfeeding mothers, an area for visual and performing arts, a clear visual link to the exterior patient pick-up area and provides direct access to retail areas;

(b) visible and well-lit secure areas for waiting, including a seating area for visitors/families waiting for rides/taxis, to meet others, etc. and for discharged patients awaiting pick-up by family members;

(c) centrally and conveniently located public washrooms that include at least one wheelchair accessible stall capable of accommodating bariatric people;

(d) a holding area for wheelchairs for patients who have been discharged to keep the wheelchairs out of circulation space; and

(e) a suitably located wall or other appropriate space for the Authority to recognize persons that have made donations to the Authority.

7. RETAIL SPACE

7.1 General

Project Co will provide a minimum of 1,000 square meters of shelled retail space at ground level that can accommodate complementary uses such as restaurant, coffee shop, pharmacy, fitness shop, fitness centre, daycare, dry cleaning, seniors' care, bookshop, gift shop, health facilities, and general commercial uses. The Authority intends to lease this space and have third party tenants assume operational costs for their respective retail spaces. Accordingly, Project Co will design and construct the retail space so that it is suitable for leasing to third parties, on usual commercial terms and conditions, including separate metering and mechanical/electrical connections.

Project Co will design the retail space to include exterior as well as interior (lobby, atrium or corridor) access, with exterior and interior design that is suitable for retail tenancies (including for example, full height glazing, door access and provision for signage).

7.2 Conversion to Program Space

Project Co will design the retail space so that it is capable of being cost effectively converted into program space at the option of the Authority.

8. EXTERNAL SPACES

8.1 Quality of Space

Project Co will:

(a) make exterior environments of the Site conducive to use by visitors, patients, staff and community, as appropriate;

(b) encourage year round use through the inclusion of shade devices and protection from wind and rain;

(c) incorporate spaces for solitude, small groups and larger gatherings;

(d) design outdoor spaces so that they are conducive to healing and recovery;

(e) design outdoor spaces for visual appeal year round; and

(f) protect existing trees on and adjacent to Richmond Road and include them within the design of outdoor spaces.

8.2 Environmental Considerations

Project Co will:

(a) design all hard and soft landscape elements for low maintenance and durability;

(b) use surface drainage techniques for landscape areas wherever possible; and

(c) use native or naturalized plant materials wherever practical.

8.3 Circulation

Project Co will:

(a) design the Facility to allow for pedestrian circulation between the following areas:

(1) from Bay Street to major entrances;

(2) from Facility lobby to retail space;

(3) from West Block to Heritage Garden; and

(4) from Facility lobby to Heritage Garden;

(b) make all pathways or roadways hard surface and barrier free;

(c) provide lighting of all pathways.

8.4 Outdoor Access

Project Co will design the Facility:

(a) so that visual and physical access is provided from the neighbourhood wherever possible and practical;

(b) to allow for access between the following areas:

(1) from the psychiatry units to secure outdoor space;

(2) from the ground floor to outdoor space; and

(3) from retail space to outdoors.

(c) so that it is possible for maintenance and emergency vehicles to access all at-grade outdoor spaces such as courtyards, parks and patio areas.

8.5 Outdoor Courtyards

Project Co will provide outdoor spaces in the design of the Facility to accommodate programmed activities, including:

(a) space to accommodate spill-out retail/commercial activities, including space for a restaurant patio, retail vending and special events;

(b) space and hard landscape elements conducive to healing and recovery that may be used as a component of physical and occupational therapy;

(c) space which acts as the “front garden” of the Facility which should be fully accessible to the public with strong connections to the RJH site and the neighbourhood;

(d) space to accommodate semi-public/private activities; and

(e) spaces for activities including patient/family visiting, staff breaks/retreats.

9. ACUTE MEDICAL / SURGICAL / SPECIALIZED INPATIENT CARE UNITS

9.1 General

Project Co will include in the Facility medical/surgical inpatient units (“**Medical/Surgical Inpatient Units**” or “**Medical/Surgical IPUs**”) for the delivery of secondary and tertiary acute care to medical and surgical adult inpatients as follows:

(a) include a minimum of 418 Medical/Surgical Inpatient Unit beds in the Facility with types as indicated in the Summary of Accommodations;

(b) provide for an enhanced focus on design that is beneficial to patients, families and staff; and

(c) place emphasis on the presence and participation of family in the care and support of the patient.

9.2 Scope of Services to be provided by the Authority

(a) Project Co will design the Medical/Surgical IPUs and the Facility to accommodate the following healthcare services to be provided by the Authority:

(b) Scope of Clinical Team Services

(1) Nursing services in the Medical/Surgical IPUs will include:

(A) provision of routine and emergency nursing care (vital signs, wound care, physical assessments, providing assistance with activities of daily living, treatments, observing and documenting progress, medication administration, consultation with other members of the clinical care team including physicians, pharmacists, social workers, rehabilitation therapists, pastoral care advisors and other interdisciplinary team members);

(B) conducting shift reports and participating in interdisciplinary patient conferences;

(C) preparing patients for diagnostic and treatment services;

(D) maintaining patient electronic charts/records;

(E) educating patients, family, staff and students;

(F) mentoring students and new/younger staff; and

(G) facilitating patient comfort and relaxation, recreation and activation; and

(H) providing family/visitor support, consultation and counselling.

(2) Physician services in the Medical/Surgical IPUs will include:

(A) admitting patients directly or via the emergency areas;

(B) documenting historical medical information;

(C) documenting patients' medical progress on patient electronic charts;

(D) providing physical examinations and some medical procedures;

(E) prescribing medications, consulting with nursing staff and pharmacists;

(F) providing emergency medical examination and treatment;

(G) ordering medical diagnostic and treatment procedures;

(H) participating in interdisciplinary patient conferences; and

(I) educating patients, family, staff, students, and residents.

(3) Clinical professional service team members (e.g., social work, physiotherapy, occupational therapy, respiratory care, laboratory, pharmacy, education, spiritual care, etc.) will provide support to the Medical/Surgical IPUs; the Authority intends to provide team members shared work and counselling space on the units or in the shared support areas between units as follows:

(A) members of the clinical teams requiring an office will only be allocated 1 office; when working on other units, they will use one of the multi-use workstations or multi-use/shared offices;

(B) some clinical professional service team members (e.g., physiotherapy, occupational therapy, respiratory care, medical laboratory, pharmacy, education, spiritual care, etc.) will respond to the Medical/Surgical IPUs from their operational base, as required; this operational base may be in another building at RJH;

(C) physiotherapy/occupational therapy will have access to one satellite treatment area on each unit or floor to support medical/surgical beds;

(D) social workers will have dedicated office space if they have dedicated program assignments; counselling will occur in the office, in the patient's room or in a quiet/counselling room on the floor;

(E) pharmacists will have dedicated office space if they have dedicated program assignments;

(F) dieticians will have dedicated office space if they have dedicated program assignments; and

(G) these associated clinical professionals will be involved in interdisciplinary patient conferences from time to time.

(c) Scope of Education Services

(1) Each Medical/Surgical IPU will provide clinical resources in support of teaching programs; participation in on-unit care activities may occur for the following types and numbers of students:

(A) medical/surgical residents, 2 - 4 at a time;

(B) medical undergraduates, up to 4 - 6 at a time;

(C) nursing (diploma, undergraduate and graduate) students, up to 8 at a time per IPU (on one shift);

(D) pharmacy undergraduates/residents, 2 at a time;

(E) physiotherapy students, up to 2 at a time;

(F) occupational therapy students, up to 2 at a time;

(G) respiratory therapy students, up to 2 at a time;

(H) dietetic intern, 1 at a time; and

(I) social work students, up to 1 at a time.

(2) Clinical teaching programs will be accommodated in patient care areas. Clinical teaching will occur at the bedside, in other team spaces on the units and in the teaching spaces on each floor. The teaching spaces will be a shared resource.

(3) Inservice education and patient teaching programs will be conducted on a regular basis throughout the unit's patient/ clinical care spaces as well as in staff conference/meeting room(s) and patient/family teaching room(s) equipped with videoconferencing facilities.

(d) Scope of Research Services

(1) The Authority may undertake research activities but will not require unique staff or facility resources in the Facility. Office/work space will be made available to clinical researchers on an as-needed basis in the IPU floor support areas.

9.3 Current Trends

Project Co will take into account the following trends in designing the Medical/Surgical Inpatient Units and the Facility:

(a) increasing treatment of infectious disease, immune suppressed patients,

(b) increasingly elderly patients with conditions such as confusion, cognitive impairment, dementia, memory loss, difficulty in ambulation and personal care self-management;

(c) increasing incidence of co-morbidities;

(d) increasing co-ordination with primary care for discharge arrangements;

(e) increasingly specialist-oriented and more complex surgery;

(f) increasing range of procedures, both invasive and non-invasive, including at the bedside;

(g) increasing numbers of tertiary referrals; and

(h) increase in the services delivered by multi-disciplinary teams, involving physicians, surgeons, radiologists, specialist nurses, laboratory, rehabilitation and technical staff.

9.4 Operational Description

(a) Project Co will design the Medical/Surgical IPUs and the Facility to accommodate the following operations:

(b) Hours of Operation

(1) Services will be operated 24 hours a day, 7 days a week and every day of the year.

(c) Patient Management Processes

(1) Reception/Admission

(A) Patients will be admitted to an IPU through the emergency department, as scheduled patients by pre-arrangement through the admitting office, or through inter-hospital transfers. Each IPU will have its own designated reception desk. On admission, ambulant patients will report to the reception desk. The reception desk will act as the unit clerk's base.

(2) Care

(A) Patients will be admitted to a specific bed based on their need for observation, assistance, diagnosis or acuity.

(d) Family Visitation and Participation

(1) Patients' families will be encouraged to participate in the care of the patients.

(2) Each patient room will provide space for family members to be in the room and not be in the way of care staff; in consultation with the care team, a family member will have the option of staying overnight in the patient room.

(e) Staff Work Processes

(1) Communications

(A) Each IPU will be administered from a reception desk, which will also act as a reception/control point for access to the unit; and

(B) a multi-disciplinary team approach to care will be followed on the units and this team will vary in composition and size over time and with the needs of the patients.

(f) Care Delivery

(1) Care delivery will be based on a patient-centred, family-involved service supported by an interdisciplinary team.

(2) RN's, LPN's and other care providers will generally be assigned for all of the nursing care provided

(3) Staff utilize visual and audible supervision of patient bedrooms in their delivery of care; maximum visibility between staff work areas and the head of patients is preferred.

(4) Staff require spaces to rest (including the ability to lie down in a quiet environment), view educational content, access the internet and prepare and consume meals.

(5) Reduced travel distances increases the effective capacity of care providers.

(g) The Care Station

(1) Supports the administration and preparation of medications, including hand washing.

(2) Accommodates communications including telephones, nurse call, patient's records and charts, storage, and computer terminals.

(3) Supports multidisciplinary clinical staff to enter information to clinical records by electronic means, discuss clinical issues, make confidential telephone calls, and review digital x-rays and other diagnostic results.

(h) General Medical/Surgical - Staff Services

(1) Staff Services will generally be provided on each floor, as close to staff as practical.

(i) General Medical/Surgical - Pharmacy Services

(1) Pharmacy delivery is designed to be at point of care.

(j) General Medical/Surgical - Storage

(1) Provide adequate and appropriate storage areas and space for all furniture and equipment within the units including, in particular, space for furniture and equipment that is temporarily not being used;

(k) General Medical/Surgical – Clean supplies

(1) General medical/surgical supplies, including sterile supplies, are generally transported by the Authority staff to the appropriate locations on the unit using a scheduled top-up cart system;

(2) Negative pressure private rooms are supported through delivery to a location out of the general corridor where isolation carts would be stored.

9.5 Functional Content

(a) General Medical/Surgical - Staff Requirements

(1) The Authority estimates that the Medical/Surgical IPUs will have a total staff complement of 400 - 450 full-time equivalents staff (excluding physicians, residents, clerks, students, volunteers), estimated as follows:

(A) 10 - 12 patient care managers;

(B) 10 - 12 patient care coordinators;

(C) 12 - 14 nurse clinicians;

(D) 175 - 200 registered nurses;

(E) 70 - 80 licensed practical nurses;

(F) 10 - 14 social workers;

(G) 6 - 8 clinical dieticians;

(H) 70 - 80 aides; and

(I) 30 clerical/administrative personnel.

(b) General Medical/Surgical – Volume of People

(1) The following is an example of the volume of people that may occupy the noted functional areas at a given time. The figures provided are an example only and will vary over each unit, floor, time of day and day of week.

Functional Areas	Patients	Staff	Visitors	Others	Total
9-18 Bed Care Cluster					
Patient Care Area	10-12	4-5	20-25	3-5	37-47
32 – 36 Bed Support Area					
Patient Care Support Area	2-4	15-20	8-10	1-2	26-36
64-72 Bed Support Area	8-10	30-40	4-5	10-15	52-70

Note: High numbers of people in the support areas reflect numbers during an 'event' such as change of shift report, rounds in the conference room, or the use of some of the flex space on certain units for a Rehabilitation therapy satellite, which would attract a number of patients during certain portions of the day.

9.6 Design Requirements

(a) Security of Wanderers

(1) Project Co will include special provisions in the design of the Medical/Surgical IPUs to prevent cognitively impaired patients from wandering away from the Medical/Surgical IPU.

(b) Universal Room

(1) Project Co will design the inpatient rooms to include the minimum requirements described in the Summary of Accommodations and within the space available to provide features of a universal room, including:

(A) a washroom that is fully accessible in a location that minimizes travel distances within the room and the potential for falls;

(B) maximum observation of the patient from the corridor;

(C) a headwall located immediately adjacent to the intended location of every inpatient bed that, except as set out below, is designed with duplicate, symmetrical services on both sides of the bed; in a two-bed room layout where each bed shares a common wall the head wall services between the two beds may be shared; design and install to meet or exceed all relevant CSA & ULC codes and regulations for the full range of requirements of an Acuity Adaptable Direct Patient Care Area, environment and use, include the following:

(i) Oxygen: 2 connections (1 on each side of the bed);

(ii) Medical air: 2 connections (1 on each side of the bed);

(iii) Vacuum: 2 connections (1 on each side of the bed);

(iv) Nurse Call Stations: 1 which includes the following functions: Nurse Call, Staff Assist, Code Blue, Aux Input, 2-way Communication;

(v) Electrical Duplex Receptacles: 10 duplex receptacles total (2 low and 3 high on each side of the bed). Electrical service type per code based on Acuity Adaptable room requirement;

(vi) Bed connection “Jack” for LV control of lighting, nursecall, bed monitoring, and patient entertainment as per currently accepted industry standard: 1 connection wire and connect to appropriate interface(s);

(vii) Data/Tele outlet: 4 outlets (2 on each side of the bed);

(D) Include separate lighting control within the inpatient room for each of the care givers zone, the patient zone and the family zone;

(E) provide adequate designated storage areas and space for all furniture and equipment that will be used in the impatient room and that does not have designated storage space elsewhere in the Facility; and

(F) a family zone and a staff work zone with its own hand washing sink.

(c) Safety in the Workplace

Project Co will design staff workstations to be secure at all times, including at night, to provide safety for staff, such as using glass walls for visibility and/or staff emergency call system systems.

10. MENTAL HEALTH AND ADDICTIONS – INPATIENT UNITS

10.1 General

Project Co will include in the Facility mental health and additions inpatient units ("**Mental Health Inpatient Units**" or "**Mental Health IPUs**") for the delivery of care to adult and geriatric mental health and addictions inpatients as follows:

(a) include a minimum of 82 Mental Health Inpatient Unit beds;

(b) provide for an enhanced focus on design that is beneficial to patients, families and staff; and

(c) place emphasis on the presence and participation of family in the care and support of the patient.

10.2 Scope of Services to be provided by the Authority

(a) Project Co will design the Mental Health Inpatient Units and the Facility to accommodate the following services to be provided by the Authority:

(b) adult and geriatric inpatient services currently anticipated to be in the following distribution:

(1) Adult Program: a 55 bed program for adults less than 75 years old with:

(A) 10 of the beds organized as a psychiatric intensive care unit ("**PICU**");

(B) locate the 15 beds associated with the mood disorder populations are adjacent to the PICU;

(C) 30 beds serve the schizophrenia and general psychiatric populations and may be operated as locked or unlocked units;

(2) Geriatric Program: a 27 bed unit designed for geriatric patients (older than 74 years old) divided into three groups of 9 beds; one of the 9 bed grouping designed as a locked unit with its own dining, activity areas and seclusion rooms;

(c) the services of both programs described above in Section 10.2(b) are intended to be fully integrated with other related service components of the Authority's mental health program, including other programs in the community;

(d) patients will undergo assessments including physical, functional and psychiatric evaluations; physicals will be performed by hospitalists, functional assessments by occupation therapists, psychiatric assessments by psychiatrists, residents and medical students; nurses and social workers will also do evaluations;

(e) care is intended to diagnose, stabilize, provide intensive treatment for acutely ill individuals, most of whom suffer from major mental disorders, and prepare them for discharge;

(f) the objective of both programs is to sufficiently stabilize and treat individuals to allow treatment and appropriate supports to enable discharge to a community setting;

(g) therapeutic modalities will include individual and group therapy, pharmacotherapy, ECT (this therapy is not located in the Facility), occupational, physiotherapy and recreational therapy;

(h) all programs subscribe to the principles of broad-based care, being offered through a multi-disciplinary care team. This team will include the following mental health workers:

(1) nurses/health care worker (RN, RPN, LPN);

(2) psychiatrists;

(3) social workers;

(4) rehabilitation therapists (recreational therapists, physiotherapists, occupational therapists (including therapy assistants));

(5) hospitalists;

(6) psychologists;

(7) psychology associates (psychometrists);

(8) family physicians;

(9) pharmacists;

(10) clinical nutritionists;

(11) addiction workers;

(12) health promotion workers;

(13) residents, students of many disciplines; and

(14) spiritual care staff.

(i) Education Services

(1) A wide range of educational and research functions will take place within the Mental Health IPUs, including:

(A) the training and supervision of residents and medical students; sound proofed consultation rooms, one way mirror rooms and group therapy rooms are critical to support this function.; these rooms need to be separate from the offices needed for nurse coordinator, occupational therapist, social worker, and psychometric assessments;

(B) educational programs both in person and via video conferencing for a wide variety of clinicians and staff including, but not limited to: medical students and residents, rehabilitation therapy students, social work students, pastoral care students, psychology students and interns and nursing students (telemedicine and telehealth capacity is critical to support and provide distance education, communication and research functions);

(C) telehealth possibilities also involve ability to teach, do consultations, do enhanced skills training up island; and

(D) opportunities for the ongoing education and skills training of community-based providers of mental health services, family members and patients.

(j) Research Services

(1) Research services will include the following:

(A) development, implementation and evaluations of programs and continuous quality improvement (CQI) initiatives;

(B) ongoing monitoring of client outcomes and consumer and family satisfaction; and

(C) participation in rigorous research studies, such as clinical trials and epidemiological studies including basic science research.

(k) Exclusions

(1) The Authority's mental health/psychiatry program excludes emergency/crisis intervention services and clinical decision unit services that are provided in the emergency department.

10.3 Current Trends in Care Delivery

Project Co will take into account the following trends in designing the Mental Health Inpatient Units and the Facility:

(a) increasing development of mental health databases, outcome measures, and best practices;

(b) increasing integration of hospital community services;

(c) increasing integration with island medical school and residency program;

(d) increasing number of self-help groups;

(e) increasing patient acuity and complexity;

(f) increasing numbers of patients with addictions and mental disorders (concurrent disorders);

(g) increasing numbers of elderly mental health and additions patients and therefore more patients with co-morbid medical disease; and

(h) increasing electronic record and other technical innovations.

10.4 Operational Description

(a) Project Co will design the Mental Health IPUs and the Facility to accommodate the following operations:

(b) Hours of Operation

(1) Services will be operated 24 hours a day, 7 days a week and every day of the year.

(c) Patient Management Processes

(1) Patients are admitted voluntarily or involuntarily (under the *Mental Health Act*) and may be switched from voluntary to involuntary or vice versa during their admission;

(2) depending on the needs of the patient and the staff, there may be a need to control or restrict inpatient activity;

(3) patients will be admitted through the admitting office, by pre-arrangement, to an inpatient unit, or as unscheduled patients through the emergency department, and/or through inter-hospital transfers;

(4) ambulant patients will need to report to appropriate care station and, when admitted, are checked for drugs, weapons etc.

(5) patients will be admitted to a bed based on their needs; and

(6) inpatients may be introduced to outpatient programs for a few days prior to discharge.

(d) Treatment

(1) Programs will combine assessment with treatment focusing on:

(A) thorough psychiatric assessment, nurse assessment and physical examination;

(B) rapid stabilization;

(C) crisis resolution; and

(D) treatment of acute disorder, stabilization and implementation of relapse prevention strategies and preparation for discharge.

(2) Treatment will strive to move a patient from the deteriorated or acutely disturbed state to a condition where appropriate discharge can be arranged.

(3) Based on individual patient needs, the team will provide for:

(A) pharmacological intervention;

(B) behaviour control;

(C) individualized or group education/therapy, and social rehabilitation programming focusing on self care, task performance, and social competence, job finding skills;

(D) leisure/recreation, education and physical exercise;

(E) ECT treatment (procedure conducted outside of the Facility); and

(F) family and social network assessment and interventions.

(4) There will be a close liaison between inpatient and outpatient mental health services so that patients transferred from one mode of care to the other will receive coordinated treatment.

10.5 Design Requirements

(a) Project Co will:

(b) provide two entrances for every unit – one for staff and one for patients/visitors.

(1) The patient/visitor entrance has a door at each end of a vestibule – entry and exist through these doors is controlled by the care team station – administrative

of that unit. The vestibule is equipped with CCTV and 2-way audio communication that communicates to the care team station – administrative.

(c) as practical, design the Mental Health program with separate direct access from outside of the Facility to a separate landscaped area that provides access to off-Site;

(d) in undertaking the design of secure rooms, consider the technical standards for psychiatric secure room section of “Standards: Hospital Based Psychiatric Emergency Services: Observation Units” published by the Ministry of Health and include:

(1) special treatment of fixtures;

(2) an absence of handles;

(3) tamper-proof fixtures;

(4) solid ceilings;

(5) water control shut-off from the nursing station;

(6) sound proofing;

(7) observation windows in each secure room door and in external windows, if any, have internal blinds;

(8) doors that swing in both directions; and

(9) configuration such that the general population could readily use the rooms, when they are not being utilized as secure rooms;

(e) provide blocking to allow for installation of ceiling lift tracks in every bedroom;

(1) provide ceiling lift tracks in three bedrooms in the Adult Mental Health program, and in 7 of the bedrooms in the Geriatric Mental Health program;

(f) include lockable access to an operational medical/surgical headwall in 3 bedrooms in the geriatric program and three bedrooms in the Adult Mental Health program (see Section 9.6(b)(1)(C));

(1) provide bariatric sized rooms as per Appendix 3A

(2) design to enhance noise control and to avoid disturbance of other activities;

(3) provide for seamless flooring - do not use carpets in clinical areas;

(4) ensure that all room windows in areas accessible to patients, as well as any internal glazing is secure and break proof;

(5) provide as much natural light as possible;

(6) provide adjustable and indirect lighting as required in all patient areas and offices;

(7) provide for the ability to control the amount of lighting in every bedroom with the ability to adjust the lighting separately for the care givers' zone, the patient zone and the 'family zone';

(8) provide lighting to patient bedrooms that can be controlled from the hallway as well as from the bedside (by the patient);

(9) provide opportunities for patients to express their independence and individuality;

(10) provide patients with direct access to group activity areas as well as to have the opportunity for privacy;

(11) select materials that allow for severe wear and are as resistant to damage as possible;

(12) provide adequate and appropriate storage areas and space for all furniture and equipment within the units including, in particular, space for furniture and equipment that is temporarily not being used;

(13) design to enhance the psychological effect of colour and décor;

(14) design to avoid items, colours and patterns that can be disturbing to patients, e.g. patterns with spots, camera "on" lights;

(15) provide an appropriate amount of countertop (with a minimum of 12 linear feet), lockable base cabinet and lockable wall cabinets in each activity/recreation room;

(16) minimize recesses, alcoves and places where patients can hide. Where this is not feasible provide devices to assist with visual access to these areas;

(17) ensure that all supply/utility rooms are secure from patient access and include a lockable cupboard for housekeeping/cleaning supplies;

(g) for bedrooms:

(1) provide patients with unobstructed exterior views from their beds while respecting patient safety and privacy;

(2) provide patient bedrooms that are lockable by staff but not lockable by patients;

(3) cause all bedrooms and bathrooms to be wheelchair accessible;

(4) provide all patient bedrooms with an appropriate area for personal effects that, if lockable, can be opened by staff; and

(5) include in every bedroom a ensuite bathroom with a shower that can be locked by staff but not by the patient.

(h) Care Team Stations - Administrative:

(1) for administration of Mental Health IPUs, to act as a reception/control point for access, and which should include or have direct access to:

(A) he unit clerk's workstation,

(B) volunteer station

(C) clean supplies;

(D) recycling;

(E) workstations (for PCs, a printers, fax machine, dictation, reference materials);

(F) intercom to vestibule;

(G) pneumatic tube station,

(H) remote door operator of vestibule doors,

(I) a hard wired emergency call button,

(J) CCTV monitor c/w multiplexer, connected to Mental Health IPU cameras;

(K) medication distribution and storage;

(L) location for automated external defibrillator

(M) staff lounge;

(N) staff washroom;

(O) patient wandering and staff duress - monitoring and control; and

(P) closets for storage of outer clothing for staff, students and volunteers located in a lockable area;

(Q) a conference/report room.

(2) that allow a space to where staff can retreat when their safety is at risk; Project Co will ensure that each Mental Health care team station administrative is internally monitored by CCTV sufficient to allow visual coverage of the entire care station administrative. These cameras are to be monitored and controlled from the Authority's Parking Garage central security office;

(3) that provide for direct visual supervision of patient activity areas with the highest priority first to common patient areas (e.g. activity room, dining room, lounge).

(i) for the Island Medical School and Residency Program, provide

(1) five pairs of interview/consultation rooms sufficient to hold interviewer, patients, supervisor, and case manager and possible family members with two of these pairs partitioned by one way mirrors (all interview/consultation rooms should have two entrances and CCTV);

(2) group therapy rooms should have two entrances and CCTV.

(j) for the Adult Program:

(1) Adult Units (45 beds)

(A) provide office spaces per Appendix 3A;

(B) provide access from the lounge area to its own secure outdoor area.

(C) provide two inpatient secure rooms spaced apart, one in each of the schizophrenia and the general units and:

(i) within quick response of the care station; and

(ii) avoid adjacency of these two rooms with activity, quiet areas or entrances.

(2) Psychiatric Intensive Care Unit (10 bedrooms and 4 secure rooms)

(A) design the PICU to consist of 4 intensive observation and treatment secure rooms and 10 step-down bedrooms;

(B) as practical, design the PICU with separate direct access from outside of the Facility to allow for the direct transfer of patients;

(C) provide access from the lounge area to a secure outdoor area.

(D) for the step-down unit (10 bedrooms):

(i) provide a common activity/lounge area visible from care station (ensure that patients do not have visual access to workstation monitors, charts and other information) that supports the following activities:

(i).1 dining;
(i).2 lounge for quiet games, reading, TV; and
(i).3 activity area (exercise machines, etc.);

(ii) provide glazed and direct access to its own secure outdoor space.

(E) the intensive observation and treatment unit (4 secure rooms) is a separately secured area that is monitored by CCTV and has functions as outlined in Appendix 3A.

(i) securely mount all furniture and equipment to the structure;

(ii) provide access from the lounge area to its own secure outdoor area and/or views to a natural area via glazing;

(iii) provide water control shut-off from the nursing station;

(iv) provide sound proofing;

(v) provide observation windows in the doors;

(vi) internal blinds built in to any external facing windows;

(vii) select and locate CCTV cameras to provide a complete view of each room at all light levels excluding washrooms;

(viii) offer clear visual observation from the nursing station but not from patients to the nursing station and provide an inter-communication system with the rest of the unit; and

(ix) ceiling height should be high, ideally around 3 meters.

(k) for the Geriatric Program:

(1) provide a central care team station;

(2) design all bedrooms in the geriatric program, and their associated washrooms, to accommodate patients in wheelchairs;

(3) provide a non-institutional home-like environment with security measures being unobtrusive;

(4) provide access from the lounge area to a secure outdoor area;

(5) provide 9 beds for each of:

(A) non-dementia (late onset psychiatric disorders);

(B) mild dementia complicated by psychiatric disorders; and

(C) complex dementia care (secured);

(6) the non-dementia and mild dementia programs may share activity/dining room/lounge type open spaces;

(7) Complex dementia

(A) provide 2 secure rooms in close proximity to the care station and avoid adjacency with activity, quiet areas or entrances;

(B) provide a separate activity/lounge area visible from care station that supports the following activities:

(i) dining;

(ii) lounge; and

(iii) activity area.

(l) Linen/Housekeeping Services

(1) Project Co will provide:

(A) on-unit, laundry facilities, consisting of washer(s) and dryer(s) for inpatients and/or their families to use for laundering personal clothing;

(B) All other laundry services will be provided through the off-unit laundry services.

(m) Dietary

(1) provide dining rooms sized to accommodate all patients on each unit in a single sitting at tables seating up to four patients;

(2) provide for the adult program an adjacent pantry sized to accommodate two food carts, a server line and a beverage station;

(3) provide a separate area where patients with eating disorders can eat with staff.

(n) Patient Safety

(1) Project Co will:

(2) provide durable, secured covers for items accessible to patients in unsupervised areas to reduce risk of tampering, removal, or unapproved operation;

(3) provide tamper resistant fasteners for all fasteners within the inpatient environment;

(4) design all items, objects, systems and fixtures incorporated into the Facility and accessible to patients in spaces where they are not under direct supervision so as to minimize the risk of self-harm including, but not limited to:

(A) design to be non-loopable or to release under a load of 20 kilograms and meet either the load release or non-loopability ligature release tests outlined in the Door and Hardware Federations Technical Specification DHF-TS-001: Door mounted anti-ligature devices for safety & security purposes: November 05;

(B) incorporate these features on all items, objects, systems and fixtures incorporated into Mental Health areas of the Facility, including:

(i) door hardware;

(ii) sprinklers;

(iii) shower heads;

(iv) lavatories;

(v) faucets;

(vi) lavatory valves;

(vii) shower actuators;

(viii) toilet seats;

(ix) toilet operator valves;

(x) plumbing traps and piping covers;

(xi) fire extinguisher and hose cabinets;

(xii) medical gas enclosures;

(xiii) HVAC terminal devices and covers;

(xiv) access doors;

(xv) light fixtures;

(xvi) electrical outlets;

(xvii) thermostats;

(xviii) fire alarm system components;

(xix) grab bars – make sure not filled in;

(xx) handrails;

(xxi) crash rails, rub rails;

(xxii) clothes hooks;

(xxiii) CCTV devices;

(xxiv) security and tracking devices and antennas;

(xxv) hanger rods;

(xxvi) toilet partitions;

(xxvii) mirrors;

(xxviii) bulletin boards;

(xxix) artwork hanging systems;

(xxx) window treatments;

(xxxi) shower curtains;

(xxxii) bed curtains;

(xxxiii) cabinetry; and

(xxxiv) cabinet hardware.

(o) Anti-barricade Strategies

(1) Project Co will provide patient bedroom and bathroom doors that are either out-swinging or equipped with pivot hinges (see Rixon 3065 as a measure of quality) and emergency hospital stops (e.g. McKinney DS6 as a measure of quality).

(p) Windows

(1) Project Co will provide windows that:

(A) are operable to the exterior to access fresh air, subject to design and life safety requirements;

(B) prevent patients from throwing things out of the window.

(q) Ceilings

(1) Project Co will in patient areas:

(2) not use dropped ceilings;

10.6 Functional Relationships and Key Adjacencies

(a) Project Co will:

(b) design the care station in the PICU so that it has direct visible observation of both the step-down and secure areas and has the following other features:

(1) restricted access for all doors (controlled by proximity cards and/or remote release from IPU reception/control desk);

(2) passageway between units that does not include passing through the care station;

(3) staff can directly enter both units from the care station; and

(4) the care station is secure from patient access, e.g. patients cannot climb into the care station;

11. MATERIAL RESOURCES

11.1 Scope of Services to be provided by the Authority

(a) Project Co will design and construct the Facility and provide all infrastructure required to accommodate the following services to be provided by the Authority:

(b) Food Services:

(1) The Authority will provide patient meal services through the following processes:

(A) meal production of either standard diets or special diets in the formats required for the various programs (e.g. medical, surgical, step-down care, mental health);

(B) transportation of meals to the appropriate areas in the Facility;

(C) transportation through service elevators to and from the individual patient care units;

(D) Marshalling of tray carts for return to be washed.

(2) The Authority will provide patient nourishments to the individual patient care units, including stocking individual fridges on the IPUs.

(c) Equipment Services (Central Patient Care Equipment Depot):

(1) The Authority intends to establish a new service (Equipment Tracking) that will track, dispense, collect, and ensure workability of a wide variety of patient care equipment, thereby reducing the amount of storage needed in individual patient care units, reducing congestion, reducing patient care staff time in finding and retrieving such equipment.

(2) Patient care equipment may include but not be limited to:

(A) wheelchairs;

(B) commode chairs;

(C) standard beds and mattresses;

(D) specialty beds and mattresses;

(E) patient care pumps (pain pumps, IV pumps, etc.) ;

(F) IV poles;

(G) general stretchers;

(H) specialty stretchers and stretcher beds;

(I) convenience tables (side tables, overbed tables, etc.); and

(J) bed attachments (orthopaedic frames, weights, etc.).

(3) Project Co will design the Facility so that it includes the rooms, spaces, equipment tracking system components, network components, antennas, and data cable infrastructure to support this program.

(d) Biomedical Engineering:

(1) The Authority will provide biomedical engineering services to support the programs and specialized patient care equipment in the Facility.

(2) Project Co will provide a satellite biomedical engineering workshop in the Facility for use by the biomedical team in their support to the patient care programs; only equipment not able to be dealt with in this satellite location will be transported to the RJH main biomedical engineering workshop.

(3) Project Co will provide small rooms on each floor to house racks for digital signalling systems (e.g. cardiac monitoring systems) for biomedical engineering.

(e) Medical Imaging:

(1) The Authority will provide medical imaging to support the imaging needs of the patient care programs.

(2) Patients needing X-rays, CT scans, MRI scans, Ultrasound imaging, Nuclear Medicine scans, etc will be transported by the Authority to the main Imaging Department in the Diagnostic and Treatment Building.

(3) Mobile imaging units (mobile x-ray) will be held in the Facility and will be moved to patient rooms as needed.

(f) Materials Management:

(1) The Authority will provide materials management services and will be responsible for the delivery of medical and surgical supplies to the destination locations in the patient care units.

(2) Supplies will be delivered by carts using a product top-up system.

(3) Authority staff will be responsible for identifying the quantities of medical and surgical supplies required at each location in order to meet its pre-determined quota level.

(4) Carts of supplies will be delivered to the Facility via tunnel from the main materials management stores.

(5) A secure holding/staging area will be needed at the base of the Facility service elevators in order to hold product secure as it is moved to the patient care units.

(g) Security

(1) The Authority will provide security services for the Facility. Project Co will include in the design of the Facility a space, consistent with Appendix 3A, to act as a base of security operations within the lobby for the hours that the Facility's exterior doors are unlocked.

11.2 Scope of Services Provided by Project Co

Project Co will design and construct the Facility and provide all infrastructure necessary for the performance of all Services to be performed by Project Co under this Agreement, including:

(a) separate rooms and spaces in the Facility, separate from rooms or spaces required by the Authority for its use of the Facility, as required to facilitate performance of the Services, including management offices, janitorial closets, service rooms, electrical and mechanical rooms, the mechanical penthouse, space for Housekeeping and Waste Management Services (including storage and sorting space near the elevators for waste and recyclables, and space at basement level for retail tenants to store waste and recyclables), landscaping equipment and materials storage and all other spaces needed to provide the Services and a fully functioning Facility; and

(b) screens and other pest control features.

11.3 Functional Relationships

Project Co will design the Facility so that it meets the following functional requirements:

(a) Food Services - requires direct access to a Facility service elevator that can be dedicated to meal cart delivery at meal times;

(b) Central Patient Care Equipment Depot - requires convenient access to Facility service elevators such that staff can deliver and return patient care equipment to and from the patient care units;

(c) Maintenance - requires convenient access to Facility service elevators such that maintenance staff move easily to the patient care units and other areas in the Facility;

(d) Biomedical Engineering – requires:

(1) convenient access to Facility service elevators such that these staff can move easily to the patient care units and other areas;

(2) convenient access to the tunnel linking the Facility to other buildings at RJH for ease of staff needing to move to the main Biomedical Engineering Department;

(e) Medical Imaging - Mobile X-ray alcoves will be dispersed through the floors of the Facility so as to be easily accessible to the units where patient imaging has been requested; such units are more likely to be those with step-down beds or with patients not able to move to the main Imaging Department (e.g. high care or infectious conditions).

(f) Materials Management:

(1) direct access is required between a secure staging room and the Facility service elevators;

(2) supplies rooms will be located in a place that is immediately accessible to care staff working on the IPUs.

(g) General: Food carts, supplies carts, linen carts, housekeeping bins will move between the Facility and the Diagnostic and Treatment and other RJH Buildings via tunnel.

12. TECHNICAL REQUIREMENTS FOR BUILDING SYSTEMS AND ASSEMBLIES

12.1 Site Development

(a) Municipal Off-Site Services

(1) General

Project Co will:

(A) design and construct the municipal off-Campus services to provide the infrastructure necessary to support the Facility to the satisfaction of Governmental Authorities;

(B) Project Co will obtain approval from the City for water and storm drain connections to City systems and if the City of Victoria determines that upgrades are required to the existing municipal system to service the Facility, the Authority will either:

(i) at its cost, complete such upgrades; or

(ii) pay the City for the cost of such upgrades;

(C) All works required for excavation, exposing and backfill of the proposed water and storm service connections will be the responsibility of Project Co.

(D) Project Co will provide water, storm sewer and sanitary sewer service connections to City of Victoria systems as required by the City, which requirements are as shown on Focus drawing No. 012166-20-01, sheet 1, rev. 2, a copy of which is located in the Data Room. This drawing has been accepted by the City of Victoria.

(2) Roads

(A) The Authority has completed a traffic impact study as part of the rezoning of the Site. A copy is available in the Data Room. If Project Co's design for the Facility changes the anticipated traffic impact, Project Co will provide an amended traffic impact study to the satisfaction of the City and Project Co will be responsible for the funding, design and construction of any additional required improvements.

(b) On-Site Services

(A) All on-Site servicing will meet or exceed the quality requirements for the corresponding off-site Municipal works.

(2) Sanitary Sewers

(A) The sanitary sewer system will be of a diameter, grade and depth to safely convey all effluent to gridline Q. The sanitary sewer system includes the pipes, manholes, if any, and all other required appurtenances to comply with applicable municipal and provincial standards.

(3) Storm Sewers and Drainage

(A) The storm sewer system will:

(i) be of a diameter, grade and depth to safely convey all storm water;

(ii) include storm water/oil separation devices as required by City bylaws;

(B) Project Co will provide site storm water storage and attenuation as may be required by with the City.

(4) Watermain and Appurtenances

(A) The watermain system (the main and appurtenances) will:

(i) be capable of providing domestic and fire fighting capacity for the Facility; and

(ii) include backflow preventers to protect the municipal system and on site facilities from contaminants;

(B) For the purposes of redundancy the domestic water services to the Facility will include a connection to the City system as well as a emergency only cross-connection to the Campus existing system;

(5) Road Works

(A) The on-site roadways, including the pavement, curbs and gutters, sidewalks, walkways, signage, pavement markings, and traffic calming devices, will provide safe passage between parking areas, loading areas, emergency vehicle areas, and drop off areas without requiring the driver to enter the municipal roadway.

(6) Street Lighting

(A) On-site roadways, walkways and parking areas will be lit during darkness to ensure safe vehicle and pedestrian traffic in respect to collisions, personal safety, and building access and egress. Lighting will be sympathetic to the proposed building and existing buildings on site. Lighting will be designed to not spill over into neighbouring residential areas.

(7) Electrical and Telecommunications Wiring, Gas Services

(A) The on-site work will include electrical and communications wiring and gas services to support the Facility.

(B) The electrical and emergency power tie connection points for the Facility will be located in the high voltage distribution vault that will be located in the Energy Centre on Lee Avenue. For reference see Section 13.16(g)(1)(B).

12.2 Structural Systems

Project Co will design and build the structural systems in the Facility in accordance with the following:

(a) obtain a concept review from a second Professional Engineer registered in British Columbia as described in the Association of Professional Engineers and Geoscientists of British Columbia Quality Management By-law prior to Building Permit application.

(b) Project Co will engage testing agencies to verify and document that the materials and construction methods used are in accordance with the BC Building Code, its referenced standards and the Quality Assurance Program.

(c) Design Loads

(1) Occupancy Loads:

Floors will be designed for dead and live loads according to their use and occupancy. The live load for the ground floor and any other level accessible by grade will not be less than 4.8 kPa. All other floors will be designed for a live load not less than 3.6 kPa. The structure will be designed to accommodate concentrated loads from floor, wall, or ceiling mounted fixtures, equipment and machinery, including ceiling-mounted patient lifting devices. Design loads in areas designated for storage items such as film, files, or supplies will be designed for the live load due to their intended use.

(2) Snow Loads:

S_s = 2.1 kPa

S_r = 0.3 kPa

I_s = 1.25 (ULS)

I_s = 0.9 (SLS)

Snow accumulation will be calculated in accordance with BC Building Code and the User's Guide - NBC Structural Commentaries (Part 4 of Division B).

(3) Wind Loads:

q 1/50 = 0.63 kPa

q 1/10 = 0.49 kPa

I_w = 1.25 (ULS)

I_w = 0.75 (SLS)

Wind pressures acting on the building will be calculated in accordance with the BC Building Code and the User's Guide - NBC Structural Commentaries (Part 4 of Division B).

(4) Seismic Loads:

$S_a(0.2)$ = 1.2

$S_a(0.5)$ = 0.82

$S_a(1.0)$ = 0.38

$S_a(2.0)$ = 0.18

PGA = 0.61

I_E = 1.5 (ULS)

Site Class B (Bedrock)

Site Class C (Compacted Granular Fills)

Seismic loading will be calculated in accordance with the BC Building Code and the User's Guide - NBC Structural Commentaries (Part 4 of Division B). The site classes provided are referenced from the geotechnical assessment dated April 15, 2007 by Thurber Engineering Ltd., a copy of which is contained in the Data Room.

(d) Vibration Limitations

(1) Machinery and equipment that could be a source of vibration will be located away from sensitive occupancies and be mounted on vibration isolators to eliminate undesirable effects. Structural floor systems will be designed to have an acceleration limit of .5% g with a damping ratio of .02 when an excitation force of .29 kN is applied.

(2) In areas where vibration-sensitive equipment will be installed, the structural system will be designed to provide vibration limitation in accordance with specific manufacturer requirements.

12.3 Building Envelope

(a) Project Co will design and build the building envelope of the Facility in accordance with the following:

(b) Exterior walls and wall systems

(1) Basic Requirements

(A) The exterior walls and exterior wall systems:

(i) may be part of the building structure or independent of the building structure. and

(ii) will maximize the area of windows serving patient care spaces.

(2) Performance Criteria

(A) Project Co will design and construct exterior walls in accordance with the following criteria and standards:

(i) Conform to the Environmental Separation requirements of the BC Building Code to prevent the penetration of water or water

vapour through or into the exterior walls and prevent condensation within the wall composition and in addition:

(ii) Resist the transmission of external airborne sounds detrimental to the needs of the Facility and the delivery of the health care services.

(iii) Minimize thermal bridging.

(iv) Exterior walls to Psychiatric units will be constructed to resist physical abuse and escape.

(c) Roofs and Roof Systems

(1) Basic Requirements

(A) The roofs and roof systems will:

(i) Comprise the external and complete horizontal barrier to weather and climate.

(ii) Provide at all roof tops, as required, fall restraint systems and accommodations for window washing equipment.

12.4 Interior Building Components

(a) Project Co will design and build the Facility's interior building components in accordance with the following:

(b) Internal Walls and Partitions

(1) Basic Requirements

(A) The interior walls and partition systems will:

(i) Provide acoustic separations as required for the specific functions to be carried out in the spaces affected.

(ii) Provide separations required for fire safety and protection

(2) Performance Criteria

(A) The following criteria and standards will govern and be integral to the composition of internal walls and partitions.

(i) Seismic resistance capabilities will conform to the requirements of CSA S832-06 Guidelines For Seismic Risk Reduction of Operational and Functional Components of Buildings.

(ii) Acoustic performance of internal walls and partitions will be to the values in Table 12.4: Sound Transmission Limitations set out below.

(B) Design and select interior walls and partitions, partition systems and interior finishes to comply with the following criteria as may be relevant for the particular or specific functions enclosed:

(i) Acoustic requirements listed above.

(ii) Cleaning, maintenance and infection control.

(iii) Permanence and durability including impact resistance.

(iv) Flexibility and adaptability of services.

(v) Aesthetic and design qualities to provide a healing environment for the benefit of patients, staff and public.

(vi) Low VOC emissions so as to minimize adverse impact on indoor air quality and indoor environmental quality.

(vii) Flexibility to permit adaptability of the internal spaces, if required to suit future process revisions.

(c) Ceilings

(1) Basic Requirements

(A) The ceiling systems will be part of the definition of interior spaces and may be accessible or inaccessible in total or in part.

(B) Accessible ceiling systems may provide access to the ceiling spaces throughout the system or at specific and particular locations.

(C) Ceiling systems will comprise a major component of the acoustic or sound attenuation function as required in the spaces in which they are installed.

(D) Ceiling systems will form a component of fire resistance rated separations for areas requiring such separation.

(E) Ceiling height will not be less than 2.7 metres above the finished floor in all areas except for the following:

(i) Ceiling heights in corridors, storage rooms and toilet rooms will be not less than 2.4 metres except that ceiling heights in small, normally unoccupied spaces such as storage closets may be reduced.

(ii) Suspended tracks, rails and pipes located in the traffic path for patients in beds and/or on stretchers, including those in inpatient service areas, will not be less than 2.2 metres above the finished floor.

(iii) For the sake of consistency with existing products and materials on the RJH site all components including tiles and suspension system will be of an imperial dimension standard.

(2) Performance Criteria

(A) The following criteria and standards will govern and be integral to the composition of ceilings.

(i) Acoustic performance will be to the values of Table 12.4: Sound Transmission Limitations set out below.

(B) Design and select ceiling systems and ceiling finishes to comply with the following criteria as may be relevant to the particular or specific functions of the space.

(i) Cleaning, maintenance and infection control.

(ii) Flexibility and access to the spaces above.

(iii) Compatibility with mechanical, plumbing, electrical, communications services and fixtures.

(iv) Compatibility with ceiling attached equipment or systems such as patient lifts, curtain track, IV tracks and TV monitors.

(v) Low VOC emissions so as to minimize adverse impact on indoor air quality and indoor environmental quality.

(vi) Aesthetic and design qualities to provide a healing environment for the patients, staff and public.

(d) Floor Finishes

(1) Basic Requirements

(A) The floor and floor systems will be a component of the definition of interior space and will be finished to be complementary and integral to the functional and aesthetic requirements of the interior space.

(B) Floor finishes will be selected to suit types and concentration of pedestrian and / or vehicular/wheel traffic to be anticipated.

(C) Flooring designs and patterns may comprise a component of the “way finding” system of the Facility.

(2) Performance Criteria

(A) The following criteria and standards will govern and be integral to the selection of floor finishes.

(i) Cleaning, maintenance and infection control including the frequency and quality of joints and also including ease of replacement if and when required.

(ii) Imperviousness to concentrations of moisture anticipated to be existing on the floors and duration of that moisture.

(iii) Permanence and durability and resistance to concentrated service traffic both pedestrian and wheel vehicular.

(iv) Aesthetic and design qualities to provide a healing environment for the benefit of patients, staff and public.

(v) Low VOC emissions so as to minimize adverse impact on indoor air quality and indoor environmental quality;

(vi) Patterns and textures compatible with the requirements for pedestrian safety and elder friendly design

Table 12.4: Sound Transmission Limitations

Adjacency between spaces	**STC[1] Class - Walls**	**STC[1] Class - Floors**
Between patient rooms	45	50
Between treatment rooms	45	50
Between patient rooms and public spaces i.e. lobby, dining room, activity room (excludes corridor serving patient room)	45	50
Between patient rooms and adjacent corridor	45	50
Between patient rooms and service areas i.e. elevator and elevator machine room, mechanical rooms on the same floor or above patient rooms, offices, care	50	50

stations		
Between toilet rooms and public space	45	-
Between patient rooms and conference rooms	50	-
Between conference rooms and public space	45	-
Between patient rooms and staff lounges	45	-
Between public space and staff lounges	40	-

13. ARCHITECTURAL AND STRUCTURAL SPECIFICATIONS (DIVISIONS 1 TO 14)

As this is a performance specification, named products or materials throughout this document represent the level of performance required and can be replaced with a product or material of equivalent or better performance characteristics.

13.1 General Requirements (Division 1)

This section not used.

13.2 Site Construction (Division 2)

(a) Basic Requirements

(1) The works must service the Facility and the expected land use with a reliable infrastructure.

(2) The infrastructure must be maintainable without disrupting the effective operation of the hospital and the related land uses.

(3) All existing services must remain in operation during construction of the new building.

(b) Municipal Servicing Works

Refer to Section 12.1 of this Schedule.

(c) Site Works, Site Improvements and Amenities

(1) Quality Requirements

(A) Site Works

(i) Streets, sidewalks and curbs that are required to be cut and restored during construction, or damaged during construction will be repaired to local municipal standards.

(B) Site Improvements and Amenities

(i) Planting materials and workmanship will conform to the following standards.

(i).1 Canadian Nursery Trades Association (CNTA).

(i).2 British Columbia Nursery Trades Association (BCNTA).

(i).3 British Columbia Landscape Standard (BCLA).

(2) Performance Requirements

(A) Site Improvements and Amenities.

(i) Planting and landscaping will conform to requirements of the British Columbia Landscape Standard.

(ii) Protection of existing trees as described in Section 8.1(f).

13.3 Concrete (Division 3)

(a) Basic Requirements

(1) Reinforced concrete design and construction, both cast-in-place and precast, that meets or exceeds current Canadian standards and practice as set out in this section, may be considered for building elements and systems, where appropriate.

(2) The list of technical references is not intended to be a complete list of applicable standards. Design and construction will comply with applicable standards and practices whether listed in this section or not.

(b) Technical References

(1) CSA A23.3-04 - Design of Concrete Structures.

(2) CAN/CSA-A23.1-04/A23.2-04 - Concrete materials and methods of concrete construction/Methods of test and standard practices for concrete.

(3) CSA A23.4-05 - Precast Concrete - Materials and Construction.

(4) CAN/CSA G30.18-M92 (R2002) - Billet-Steel Bars for Concrete Reinforcement.

(5) ASTM A185-06 - Standard Specification for Steel Welded Wire Fabric.

(6) CAN/CSA W186-M1990 (R2002) - Welding of Reinforcing Bars in Reinforced Concrete Construction.

(c) Concrete

(1) Overriding Principles

(A) Design and construct cast in place or precast concrete of appropriate properties for the intended use in accordance with the requirements of all applicable codes and specifications.

(2) Quality Requirements

(A) Inspection and testing of cast in place concrete and concrete materials will be carried out by a testing laboratory in accordance with CAN/CSA A23.1-04. Non-destructive Methods for Testing Concrete will comply with CAN/CSA A23.2-04.

(B) Inspection and testing of precast concrete materials and workmanship will be carried out by the precast concrete contractor as part of its quality control program in accordance with CAN/CSA-A23.2-04. Maintain plant records and a quality control program as required by CSA A251.

13.4 Masonry (Division 4)

(a) Basic Requirements

(1) Masonry design and construction that meets or exceeds current Canadian standards and practices as set out in this section, may be considered for building elements and systems, where appropriate.

(2) Masonry construction may be considered for exterior walls and walls systems where permanence of finishes, both visually and functionally, and ease of maintenance are primary considerations in the exterior fabric of the Facility.

(3) Masonry construction may be considered for interior walls and wall systems when priorities include, permanence and maintenance, sound transmission control, fire resistance and separation requirements and security.

(4) The following lists of technical references are not intended to be a complete list of applicable standards. Design and construction will comply with applicable standards and practices whether listed in this section or not.

(b) Concrete Masonry Units

(1) Technical References

(A) S304.1-04 - Design of masonry structures.

(B) CSA-A165 - Series-04 CSA Standards on concrete masonry units.

(C) CSA-A179-04 - Mortar and grout for unit masonry.

(D) CSA-A371-04 - Masonry construction for buildings.

(E) CSA-A370-04 - Connectors for masonry.

(F) CAN/CSA-A23.1-04/A23.2-04 - Concrete Materials and Methods of Concrete Construction / Methods of test and standard practices for concrete.

(G) ASTM A82/A82M-05 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

(H) CSA-G30.18-M92 (R2002) - Billet-Steel Bars for Concrete Reinforcement.

(2) Overriding Principles

(A) Concrete unit masonry may be considered for both independent exterior walls and in exterior wall systems as a structural backing to other finish materials or systems.

(B) Concrete unit masonry for interior applications may be considered as an integrally finished material, as a base for applied finish and as a structural backing to other finish systems.

(i) Painted or unpainted concrete unit masonry will not be considered an acceptable exposed finish in clinical areas.

(3) Quality Requirements

(A) Masonry design and construction will comply with all applicable codes and standards including, but not limited to, CSA S304.1-04, the BC Building Code, and the standards listed in the Technical References.

(B) Concrete unit masonry practices and work standards will comply with Canadian Masonry Contractors Association (CMCA) Masonry Practices Manual, CSA-S304.1-04, and CSA-A371-04.

(c) Brick Masonry

(1) Technical References

(A) S304.1-04 - Design of masonry structures.

(B) CSA-A82-06 - Fired brick made from clay or shale

(C) ASTM C216-07 Standard Specification for Facing Brick (Solid Masonry Units made from Clay or Shale).

(D) CSA-A179-04 - Mortar and grout for unit masonry.

(E) CSA-A371-04 - Masonry construction for buildings.

(F) CSA-A370-04 - Connectors for masonry.

(G) Canadian Masonry Contractors Association (CMCA) Masonry Practices Manual (BC & Yukon Chapter).

(2) Overriding Principles

(A) Exterior wall systems comprising brick masonry as a finish veneer to concrete, concrete masonry or metal framing will be a rain screen or cavity wall system.

(B) Brick masonry in interior applications will have integral finish and construction compatible to the maintenance and infection control requirements of Authority.

(d) Stone Masonry

(1) Technical References

(A) S304.1-04 - Design of masonry structures.

(B) ASTM C568-03 - Standard Specification for Limestone Dimension Stone.

(C) ASTM C615-03 - Standard Specification for Granite Dimension Stone.

(D) ASTM C503-05 - Standard Specification for Marble Dimension Stone

(E) ASTM C616-03 - Standard Specification for Quartz-Based Dimension Stone

(F) CSA-A179-04 - Mortar and grout for unit masonry.

(G) CAN/CSA-A5 - Portland Cement.

(H) CSA-A371-04 - Masonry construction for buildings.

(I) CSA-A370-04 - Connectors for Masonry.

(2) Overriding Principles.

(A) Stone masonry may be considered as a finish veneer to concrete walls or concrete masonry walls. Exterior wall systems in such applications will be a rain screen or cavity wall system.

(3) Quality Requirements.

(A) Stone will be sound, hard, durable, well seasoned and of uniform strength, colour and texture, free of quarry sap, flaws, seams, sand holes, iron pyrites or other mineral or organize defects.

13.5 Metals (Division 5)

(a) Basic Requirements

(1) Structural steel, steel deck, and cold-formed steel stud design and construction that meets or exceeds current Canadian standards and practices as set out in this section, may be considered for building elements and systems, where appropriate.

(2) The following lists of technical references are not intended to be a complete list of applicable standards. Design and construction will comply with applicable standards and practices whether listed in this section or not.

(b) Structural Steel and Steel Joists

(1) Technical References

(A) CSA S16-01 - Limit States Design of Steel Structures

(B) G40.20-04 - General Requirements for Rolled or Welded Structural Quality Steel.

(C) G40.21-04 - Structural Quality Steel.

(D) ASTM A325-06 Standard Specification for Structural Bolts, Steel, Heat Treated.

(E) ASTM A307-04e1 Standard Specification for Carbon Steel Bolts and Studs.

(F) CAN/CSA-G164-M92 (R2003) Hot Dip Galvanizing of Irregularly Shaped Articles.

(G) W59-03 - Welded Steel Construction (Metal Arc Welding).

(H) W55.3-1965 (R2003) - Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

(I) W47.1-03 - Certification of Companies for Fusion Welding of Steel.

(2) Quality Requirements

(A) Inspection and testing of materials and workmanship will be carried out by an approved testing laboratory. Testing procedures as specified in

CSA S16-01 to verify soundness of representative shop and field welds will be used.

(c) Steel Deck

(1) Technical References

(A) CSA S16-01 - Limit States Design of Steel Structures.

(B) CSA-S136-01 - North American Specification for the Design of Cold-Formed Steel Structural Members.

(C) CSSBI 10M-06 - Standard for Steel Roof Deck.

(D) CSSBI 12M-06 - Standard for Composite Steel Deck

(E) CSSBI B13-06 - Design of Steel Deck Diaphragms - 3rd Edition

(F) ASTM A653/A653M-06a - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

(G) ASTM A792/A792M-06a - Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process

(H) CSA W59-03 - Welded Steel Construction (Metal Arc Welding).

(I) CSA W55.3-1965 (R2003) - Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

(J) CSA W47.1-03 - Certification of Companies for Fusion Welding of Steel.

(d) Load Bearing Steel Studs

(1) Technical References

(A) CSA-S136-01 - North American Specification for the Design of Cold-Formed Steel Structural Members.

(B) ANSI/AWS D1.3-98 - Structural Welding Code - Sheet Steel

(C) CSA W59-03 - Welded Steel Construction (Metal Arc Welding).

(D) CSA W47.1-03 - Certification of Companies for Fusion Welding of Steel.

(E) CSA W55.3-1965 (R2003) - Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

(2) Overriding Principles.

(A) Load bearing steel studs may be considered as a component of the exterior wall systems to support exterior wall finishes and form an integral part of the building envelope.

(B) Load bearing steel studs may be part of the building structure or may be independent of the principle building structural system.

(3) Quality Requirements.

(A) Load bearing steel stud design and construction will comply with CSA-S136-01.

(B) Manufacturer will be certified in accordance with CSSBI Standard 30M-06 and CSA-A660-04.

(C) Fabricator and erector will be experienced in the type of work undertaken.

(D) Conform to the Association of Wall and Ceiling Contractor's Specification Standards Manual (AWCC).

(4) Performance Requirements.

(A) Limit maximum deflection under specified wind loads to L/360, unless a smaller maximum deflection is specifically required due to wall finishes.

(B) Design components to accommodate erection tolerances of the structure.

(C) Design wind bearing stud end connections to accommodate floor/roof deflections and to ensure that studs are not loaded axially.

(D) Design steel studs to take into account the anchorage of other materials being supported including but not limited to: sub-girts supporting metal cladding and composite panels, soffit finishes and the provision of lateral support at window heads.

(e) Miscellaneous Metals

(A) (1) Technical References

(B) CSA S16-01 - Limit States Design of Steel Structures.

(C) CSA-S136-01 - North American Specification for the Design of Cold-Formed Steel Structural Members.

(D) G40.20-04 - General Requirements for Rolled or Welded Structural Quality Steel.

(E) G40.21-04 - Structural Quality Steel.

(F) A53/A53M-06a Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

(G) ASTM A307-04e1 Standard Specification for Carbon Steel Bolts and Studs.

(H) CAN/CSA-G164-M92 (R2003) Hot Dip Galvanizing of Irregularly Shaped Articles.

(I) W59-03 - Welded Steel Construction (Metal Arc Welding).

(J) CSA W47.1-03 - Certification of Companies for Fusion Welding of Steel.

(K) CSA W55.3-1965 (R2003) - Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

(2) Quality Requirements.

(A) Primers and paints of miscellaneous metals will conform to Master Painters Institute (MPI) Architectural Specification Standards Manual.

13.6 Wood And Plastics (Division 6)

(a) Basic requirements

(1) Wood products and procedures required in the construction process and as integral components of the fabric of the building will conform to the requirements set out in this division.

(2) Urea formaldehyde may not be used.

(b) Rough Carpentry

(1) Technical references

(A) NLGA Standard Grading Rules for Canadian Lumber.

(B) CSA-B111 – Wire Nails, Spikes and Staples.

(C) CAN/CSA-0141 – Softwood Lumber.

(D) CSA-0151 – Canadian Softwood Plywood.

(E) CSA-0121 – Douglas Fir Plywood.

(F) CSA-080.1 – Preservative Treatment of All Timber Products by Pressure Processes.

(G) CSA-080.9 – Preservative Treatment of Plywood by Pressure Processes.

(2) Overriding Principles

(A) Rough carpentry work including but not limited to, wood blocking, backing and fasteners, wood preservatives, wood fire retardency treatment, forming, bracing, scaffolding will be provided as required to facilitate the construction of the Facility.

(c) Finish Carpentry and Architectural Woodwork

(1) Technical references

(A) ANSI/NEMA LD3 – High Pressure Decorative Laminates

(B) ANSI A208.1 – Particleboard, Mat-Formed Wood

(C) ANSI/HPVA-HP-1 – Hardwood and Decorative Plywood

(D) ANSI A208.2 – Medium Density Fibreboard

(E) CAN3-A172 – High Pressure, Paper Base, Decorative Laminates

(F) CAN3-0188.1 – Interior Mat-formed Wood Particleboard

(G) CSA-0121 – Douglas Fir Plywood

(H) CSA-0151 – Canadian Softwood Plywood

(I) CSA-0153 – Poplar Plywood

(2) Overriding Principles

(A) Provide finish carpentry and architectural woodwork as required for wood products exposed to view in finished interior and exterior installations, including cabinets, casework (excluding laboratory casework, which will be included in Division 12), frames, panelling, trim, installation of doors and hardware, and other wood related products and applications.

(B) Provide plastic laminate surfacing and/or solid polymer fabricated surfacing as may be required to create surfaces which require antiseptic or clean characteristics, special or regular maintenance and cleaning or as required to resist the caustic action of particular chemicals or agents.

(C) Low VOC emissions so as to minimize adverse impact on indoor air quality and indoor environmental quality.

(D) Provide acrylic plastic products as may be required for wall cladding, wall protection, casework finishing, trims, ornamental elements, or other

applications to complete the quality of interior finish suitable for the use of patients and staff.

(3) Quality Requirements

(A) Design, fabrication, materials and workmanship will conform to Architectural Woodwork Manufacturer's Association of Canada (AWMAC) Quality Standards Manual (2003 edition) for minimum "Custom Grade".

(B) Installation methods and locations for finish hardware will conform to Door and Hardware Institute (DHI) standards.

(C) Adhesives will be non-toxic, non-solvent glue to comply with AWMAC Quality Standards Manual. Adhesive will meet requirements of Canadian 'Eco-Logo' program or equivalent, and will have a Total Volatile Organic Carbon (TVOC) emissive content of 20gr/litre.

(D) Use plywood substrate to counterparts.

13.7 Thermal And Moisture Protection (Division 7)

(a) Basic requirements

(1) Provide construction assemblies to prevent the ingress of moisture or water vapour into the Facility and building fabric from the exterior and the passage of air through the building envelope from the interior spaces to the exterior or from the exterior to the interior spaces.

(2) Create comfortable, liveable interior environments by providing insulation and protection to resist the transfer of heat through the exterior walls and roofs.

(3) Provide resistance to the propagation and spread of fire through the exterior walls and through those interior walls designated as fire resistance rated separations.

(4) Prevent moisture ingress through foundation walls below grade.

(b) Damp proofing

(1) Technical references

Materials and workmanship for damp proofing applied to exterior face of foundation walls below grade will conform to the following standards, as applicable:

(A) Static Type Mineral Colloid Asphalt Emulsion: Conforming to CGSB-37-GP-2.

(B) Solvent Base Waterproofing Compound: Conforming to CGSB-37-GP-16. For use at temperatures below 40C.

(C) CGSB-37-GP-3 Application of Emulsified Asphalts for Damp proofing and Waterproofing.

(D) CGSB-37-GP-36 Application of Filled Cutback Asphalts for Damp proofing and Waterproofing.

(2) Performance Requirements

(A) Ensure sufficient coverage of foundation wall surfaces to repel moisture and prevent transmission through or ingress into the foundation walls.

(B) Damp proofing will prevent the penetration of moisture through foundation walls not subject to hydrostatic pressure.

(c) Waterproofing

(1) Technical references

(A) CAN/CGSB-37.50 – Hot Applied Rubberized Asphalt for Roofing and Waterproofing.

(B) CAN/CGSB-37.51 – Application of Hot Applied Rubberized Asphalt for Roofing and Waterproofing.

(C) CGSB-37-GP-52 – Roofing and Waterproofing Membrane, Sheet Applied Elastomeric.

(D) CGSB-37-GP-56 – Membrane, Modified, Bituminous, Prefabricated and Reinforced for Roofing.

(E) CAN/CGSB-37.58 – Liquid Applied Moisture Cured Polyurethane Waterproofing membrane.

(d) Vapour Barriers

(1) Technical references

(A) CAN/CGSB-51.34 – Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

(2) Overriding Principles

(A) Provide a continuous membrane vapour barrier to prevent water vapour transmission into the exterior wall assembly and the resultant condensation of the moisture in the wall assembly.

(B) Provide a continuous membrane vapour barrier in the roofing assembly.

(C) Provide continuous membrane vapour barrier under concrete slabs on grade within the building perimeter to prevent water and water vapour transmission through the slab.

(e) Air barriers

(1) Technical references

(A) ASTM E283 – Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen.

(B) CGSB-37-GP-56 – Membrane, Modified, Bituminous, Prefabricated and Reinforced for Roofing.

(2) Overriding Principles

(A) In order to maintain a consistent and comfortable interior environment and to allow for efficient and viable environmental systems, provide a continuous membrane air barrier to prevent the ingress and egress of air through the building envelope.

(3) Quality Requirements

(A) Air barrier assemblies will be designed to limit air ex-filtration and infiltration through materials of the assembly, joints in the assembly, joints in components of the wall assembly, and junctions with other building elements including the roof.

(B) The air barrier system will be based on rain-screen principles.

(4) Performance Requirements

(A) The air barrier will prevent air leakage caused by air pressure across the wall and roof assembly including interruptions to the integrity of wall and roof systems such as junctions with dissimilar constructions to the standards as listed above.

(f) Thermal protection

(1) Technical references

(A) CAN/ULC-S705.1 – Spray Applied Rigid Polyurethane Cellular Plastic Thermal Insulation.

(B) CAN/ULC-S102 – Test for Surface Burning Characteristics of Building Materials

(C) CAN/CGSB-51.39 – Spray Application of Rigid Polyurethane Cellular Plastic Thermal Insulation for Building Construction.

CCMC 12932-R – Air Barrier System.

(D) CAN/ULC-701 – Standard for Thermal Insulation, Polystyrene.

(E) CAN/ULC-702 – Standard for Thermal Insulation, Mineral Fibre for Buildings.

(F) CAN/ULC-703 – Standard for Thermal Insulation Polyurethane and Polyisocyanurate Boards, Faced.

(2) Overriding Principles

(A) Provide thermal insulation as part of the building envelope to prevent the transfer of heat both from the interior to the exterior and from the exterior to the interior dependent on seasonal conditions.

(B) Thermal protection materials will be of a type and quality which will provide consistent environmental quality to the spaces enclosed.

(3) Quality Requirements

(A) Foamed plastic insulation will be CFC and HCFC FREE and in compliance with Province of British Columbia Ozone Depleting Substances Regulations.

(g) Roofing

(1) Technical references

(A) CAN/ULC-S102 – Test for Surface Burning Characteristics of Building Materials and Assemblies.

(B) CAN/ULC-701 – Standard for Thermal Insulation, Polystyrene.

(C) CAN/ULC-702 – Standard for Thermal Insulation, Mineral Fibre for Buildings.

(D) CAN/ULC-704 – Standard for Thermal Insulation Polyurethane and Polyisocyanurate Boards, Faced.

(2) Quality Requirements

(A) Foamed plastic insulation will be CFC and HCFC free and in compliance with Province of British Columbia Ozone Depleting Substances Regulations.

(h) Fire and Smoke Protection

(1) Technical references

(A) ULC-S115 and UL-1470 for:

(i) Fire (F), hose (H) and temperature (T) ratings.

(ii) Provision and maintenance of fire resistance rating of the adjacent floor, wall or other fire separation assembly.

(iii) Certification by ULC of cUL. Also as listed in ULC List of Equipment and Materials – Firestop Systems and Components or UL Products Certified for Canada (cUL) Directory.

(B) CAN/ULC-S101 – Fire Endurance Tests of Building Construction and Materials.

(C) CAN/ULC-S102 – Testing for Surface Burning Characteristics of Building Materials and Assemblies.

(D) UL-2079 – Tests for Fire Resistance of Building Joint Systems.

(E) ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

(F) ASTM E814 – Standard Test Method for Through-Penetration Firestopping.

(G) ULC List of Equipment and Materials – Firestop Systems and Components Directory.

(2) Overriding Principles

(A) Provide protection from the spread of fire and smoke by integrating barriers into the vertical and horizontal space separations and by application to exposed structural and non structural building elements susceptible to fire and subsequent damage.

(B) Provide protection to penetrations of vertical and horizontal fire resistance rated separations.

(3) Performance Requirements

(A) Fire-stopping and smoke seal systems will be asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases.

(B) Spray-applied cementitious fire proofing will conform to the following standards and technical references .

(i) Cementitious fireproofing will be a completely asbestos-free material, mill mixed plaster cementitious setting type, which after setting will not be affected by water, moisture or condensation.

(ii) CAN/ULC-S101 – Standard Methods of Fire Endurance Tests of Building Construction and Materials.

(iii) ULC – List of Equipment and Materials – Fire Resistance Ratings (latest edition).

(iv) WH Certification Listings.

(v) CAN/ULC-S101 – Standard Methods of Fire Tests of Building Construction and Materials.

(vi) CAN4-S114 – Standard Test Method for Determination of Noncombustibility in Building Materials

(4) Systems and materials

(A) Firestopping materials, in addition to complying with the requirements of (A) above will:

(i) be compatible with substrates

(ii) allow for movement caused by thermal cycles

(iii) prevent the transmission of vibrations from pipe, conduit or duct to structure and structure to pipe, conduit or duct.

(B) When more than one product is required for an assembly all products will be compatible and from the same manufacturer.

(C) Firestopping sealants and coatings will be silicone based, guaranteed not to re-emulsify if subject to wetting or standing water; acrylic based coatings and sealants are not acceptable.

(i) Sealants

(1) Technical references

(A) Sealant joints will conform to ASTM C1193 – Standard Guide for Use of Joint Sealants.

(B) Structural glazing sealant will conform to ASTM C920, Type S, NS, Class 25, or CAN/CGSB-19.13.

(C) CAN2-19.13 – Sealing Compound, One Component Elastomeric, Chemical Curing.

(D) CAN/CGSB-19.18 – Sealing Compound, One Component, Silicone Based, Solvent Curing.

(E) CAN2-19.24 – Sealing Compound, Multi-Component, Chemical Curing.

(F) CAN/CGSB-19.2 – Glazing Compound, Non-hardening, Modified Oil Type 19-GP-5M Sealing Compound, One Component, Acrylic Base, Solvent Curing.

(G) CAN/CGSB-19.17 – One Component, Acrylic Emulsion Base Sealing Compound.

(H) CAN/CGSB-19.21 – Sealing and Bedding Compound Acoustical.

(I) CAN/CGSB-19.22 – Mildew-Resistance Sealing Compound for Tub and Tiles.

(J) ASTM C920 – Standard Specification for Elastomeric Joint Sealants.

(2) Overriding Principles

(A) Apply sealant materials

(i) To create effective seals to the building envelope systems or around openings in the building envelope systems as required to prevent water ingress.

(ii) To seal around and over cavities in or behind surface elements to allow effective infection control.

(iii) To seal joints between dissimilar or similar materials to allow a smooth or even transitions.

(iv) To seal expansion or controls joints in the building envelope systems or structural systems to allow movement due to:

(iv).1.1 Dimensional changes caused by thermal movement.

(iv).1.2 Forces generated by differential settlements or other foundation related movement.

(iv).1.3 Horizontal or vertical forces generated by wind or other environmental or climatic conditions.

(iv).1.4 Seismic loads due to earthquake motion.

(iv).1.5 Normally superimposed building loads.

(3) Performance Requirements

(A) Exterior sealants will completely and continuously fill joints between dissimilar and/or between similar materials.

(B) Interior sealant (at frames) will completely fill joints between dissimilar materials and will be one component, acrylic emulsion type.

(C) Silicone caulking to washroom plumbing fixtures will be impervious to water and mildew-resistant

(D) Sealants for the application at expansion and control joints in concrete floors requiring self-levelling properties will be two-component epoxy urethane sealants for horizontal surfaces.

(E) Sealants for exterior vertical expansion and control joints in masonry or wall cladding will be non-sag sealant.

(F) Sealants will allow for minimum 25% movement in joint width.

13.8 Doors And Windows (Division 8)

(a) Basic requirements

(1) Spaces or rooms requiring acoustic or visual privacy, security, special HVAC requirements, fire resistance rated separations or other accessible closures will receive appropriately sized, fabricated and installed doors suited for the intended function.

(2) Rooms requiring daylight, views and/or natural ventilation will receive appropriately sized and configured and adequately constructed windows.

(3) Consideration will be given to providing “borrowed light” through interior windows for occupied rooms which do not have exterior windows. The intent is to borrow light from areas that have windows and consequently to create a more comfortable and less a closed-in atmosphere.

(4) Size Requirements for Doors.

(A) Doors will be sized in accordance with the requirements of the BC Building Code and the following Schedule of minimum door sizes.

(i) Doors through which stretchers, carts, or large mobile equipment pass on a regular basis will have a minimum width of 1200 mm. to allow ease and speed of movement. The maximum width of single doors with out leafs will be 1200 mm.

(ii) Provide double doors into rooms where large pieces of equipment will be moved in or out during the lifetime of the Building and where such equipment will not pass through 1200 mm. single doors.

(iii) Door openings must accommodate movement of Equipment.

(iv) Provide double doors in corridors and into major rooms to ease access where patients in beds or stretchers will be attended to or accompanied by a large number of medical staff.

(v) Generally doors to patient areas other than those referred to in (i) above and including doors to water closets and change room cubicles will have a minimum width of 950 mm.

(vi) No single door will be less than 750 mm wide and will be of a width to facilitate movement without obstruction.

(vii) No door or door leaf will be less than 2150 mm high unless specifically required for access to services or other purposes where height is restricted.

(5) Acoustic Requirements for doors: Doors will have an STC rating appropriate for the STC rating of the wall or partition in which the door is located. A standard solid slab door provides a nominal STC rating of 20, and would be appropriate for wall ratings as per Table 12.4.

(6) Except for rooms requiring a positive or negative pressurization, in-patient room doors will have hardware that allows the doors to stay in an open position and further allows casual observance of the patients by the nursing staff.

(7) Doors into major departments or between major departments or activity areas through which cart, stretcher, or bed traffic is anticipated on a routine basis, will be automatically activated by electronic device or by manual push button, located to allow emergency access without the necessity to stop movement. All other doors through which cart, stretcher, or bed traffic is anticipated on a routine basis or through which frequent patient or staff traffic is routine, will be capable of being held in an open position by the use of appropriate hardware or will be automatically activated.

(8) Door sizes and designs will be applied consistently to rooms of similar use, location and configuration.

(9) Doors will not swing into corridors in a manner that may obstruct traffic flow or reduce the corridor width, except doors to spaces such as small closets which are used infrequently and are not subject to occupancy.

(10) Doors may swing into patient bathrooms provided they allow for ease of patient use, both on their own and assisted by staff. Such doors will be equipped with appropriate hardware to allow the door to be opened out of the room during an emergency situation.

(11) Doors will have appropriate hinges, edge protection and face protection to minimize damage and resultant disruptive maintenance

(12) Doors and frames will have a suitable finish which prevents dirt and finger print accumulation, and is easily cleanable with the ability to be disinfected.

(13) The extent of glazing in a door, or the size and quantity of sidelights, will be consistent and balanced between the nature of observation required and the privacy requirements of the occupants of the room. Where possible and appropriate the preference is to provide glazing in an adjacent sidelight as opposed to within the door itself.

(14) Glazing in doors and sidelights will allow patient observation and safety of operation of the spaces they serve. Blinds or window coverings suitable and appropriate for the level of privacy intended and required will be provided.

(15) Doors and door frames will have the capability to withstand the varying and high levels of humidity and impact that occur typically within a hospital and in specific rooms within the hospital and maintain the inherent aesthetic and functional capacities. Frames and anchors for doors and sidelights and interior and exterior windows for special areas such as Mental Health/Psychiatry will be designed to withstand the heavy degree of impact anticipated and will maintain their aesthetic and functional capacities. Glazing within such components will be non-breakable. Use hospital-type cut-away jambs.

(16) Exterior door frames will be fully welded, pressed steel and insulated.

(17) In areas such as Mental Health/Psychiatry and security, entrances where security is considered paramount, appropriate location, configuration, materials, construction and detailing is required to ensure safety and security.

(18) Interior windows and sidelights will be constructed of tempered glass except where wire glass is required by the BC Building Code.

(19) Co-ordinate heights of glazing with adjacent wall protection, handrails, and other required accessories to achieve functional and aesthetic coordination.

(b) Hollow Metal Doors and Frames

(1) Quality Requirements

(A) Materials and manufacture of metal doors and frames will conform to the requirements of the Canadian Steel Door and Frame Manufacturer's Association (CSDFMA) .

(B) Fire resistance rated doors and frames will conform to CAN4-S104M and CAN4-S105M and will be fabricated and tested in accordance with ULC or Warnock Hersey requirements and have the appropriate ULC or Warnock Hersey fire resistance labels attached.

(C) The installed door and frame assembly including the finish hardware and finish hardware installation will conform to NFPA No. 80 Standard for fire protection ratings as applicable.

(D) Recommended locations for Architectural Hardware as published by the Door and Hardware Institute.

(E) Installation of Commercial Steel Doors and Frames as published by the Door and Hardware Institute.

(F) ASTM A653/A653M – Standard Specification for Steel Sheet Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process.

(2) Performance Requirements

(A) Interior metal doors will be:

(i) Flush faced construction.

(B) Exterior Metal Doors will be:

(i) Flush faced construction.

(ii) Surfaces prepared to resist corrosion from exposure to weather and to receive appropriate finishes.

(C) Pressed Metal Frames will be:

(i) Fully welded construction.

(ii) Complete with anchors to each jamb to suit wall type to receive the frame.

(D) Door Glazing

(i) Exterior glazing to be sealed units in thermally broken frames to prevent heat loss.

(c) Wood Doors

(1) Quality Requirements

(A) Wood doors will conform to the Custom Grade Standards as set out in the Quality Standards for Architectural Woodwork (current edition) published by the Architectural Woodwork Manufacturer's Association of Canada (AWMAC) and as specifically noted in 1.3 (c) (3) Performance Requirements.

(B) Doors requiring fire resistance ratings will be fabricated and tested in accordance with ULC or Warnock Hersey requirements and have the appropriate ULC or Warnock Hersey fire resistance labels attached.

(C) Finish hardware and finish hardware installation will meet requirements of NFPA No.80 Standard for Fire Doors and Windows, where applicable.

(2) Performance Requirements

(A) Wood doors will be flush Custom Grade quality, solid particleboard core or a similar quality.

(B) Fire resistance rated doors will conform to the AWMAC Quality Standards as referred to in 1.3 (c) (2) (A) and to fabrication, testing and labelling requirements as referred to in 1.3 (c) (2) (B)

(C) Fire resistance rated doors to be constructed with a homogeneous incombustible mineral core and AWMAC Quality Standards Option 5 blocking.

(D) Doors used in locations requiring radiation protection:

(i) Will be lead lined doors in conformance with the AWMAC Quality Standards and labelled with lead thickness.

(ii) Doors requiring acoustic STC ratings will conform to the AWMAC Quality Standards and labelled with the STC rating of the door.

(d) Aluminum Entrances and Storefront

(1) Technical references

(A) Design of exterior aluminum entrance and storefront framing will conform to CAN3-S157.

(2) Performance Requirements.

(A) Aluminum entrance and storefront framing will be thermally broken, flush glazed, aluminum sections, to accept insulating glass units.

(B) Thermally broken aluminum entrance and storefront framing will incorporate drained and vented system (rain screen) with a complete air and vapour seal, allowing any moisture entering the framing to drain to the exterior and also allow air into the pressuring chamber.

(C) Aluminum swing entrance doors will be heavy duty commercial or institutional grade and may be automatically operated, motion detector controlled.

(D) Aluminum finish for exposed aluminum surfaces will be applied in the manufacturing process and will be permanent and resistant to corrosion caused by exposure to weather and climate.

(e) Specialty Doors

(1) Technical references

(A) Smoke control doors will have been tested with UL 1784 - Air Leakage Test for Door Assemblies and will meet criteria for NFPA 105 – Installation of Smoke Control Door Assemblies.

(B) The installed fire door and frame assembly installation will conform to NFPA No. 80 Standard for fire protection ratings as applicable.

(C) CAN4-S104M – Standard Method for Fire Tests of Door Assemblies.

(D) ANSI American National Standards Institute Standards.

(E) ANSI/BHMA 156.10 – Power Operated Pedestrian Doors.

(F) ANSI/UL 325 – Door, Drapery, Gate, Louver, and Window Operators and Systems.

(2) Quality Requirements.

(A) Fire rated overhead rolling doors and counters will have the appropriate ULC or Warnock Hersey fire resistance labels attached.

(3) Overhead Rolling Service Doors

(A) Performance Requirements

(i) Restrain lateral movement of the door curtain slats. Windlocks will be provided as required by door size or special wind load requirements.

(ii) Curtain slats will be interlocking flat slats complete with bottom bar and contact type bottom astragal.

(iii) Manual operation will be provided with inside lift handle and locking bar or chain hoist. Motor operation may be provided on doors requiring constant usage. Chain operation will be by means of reduction gears and galvanized hand chain.

(iv) Fire doors will conform to testing and labelling requirements as referred to in Section 13.8(e)(2)(A).

(v) For fire doors, automatic closing device will be operated by fire door release device connected to fire alarm system.

(4) Overhead Rolling Grilles

(A) Performance Requirements

(i) Overhead rolling grille curtains will be fabricated with metal components assembled to allow visual access to areas being secured.

(ii) Grille guides will be complete with aluminum or steel guides fabricated to withstand vertical and lateral loads, counterbalanced by helical torsion springs and sound deadened.

(iii) Grilles will be manually operated by means of lift handles or by chain and gear, or may require motor operation, to be determined by Project Co in consultation with the Authority.

(5) Overhead Rolling Counter Shutters

(A) Performance Requirements

(i) Shutter curtains will be fabricated with extruded aluminum, galvanized steel or stainless steel interlocking flat slats, complete with guides of similar materials. Fire rated shutters will conform to testing and labelling requirements as referred to in Section 13.8(e)(2)(A).

(ii) Shutters will have manual operation and locking capability.

(6) Interior Aluminum Sliding Doors and Sidelights

(A) Performance Requirements

(i) Interior sliding doors and sidelights will have recessed mounted track with sliding and fixed panel(s), and suitable for single glazing with 6 mm clear fully tempered float glass. Break-away feature as required by BC Building Code.

(7) Automatic Doors

(A) Performance Requirements

(i) Automatic door systems will be ULC listed.

(ii) Automatic sliding doors will be installed at main entrance and will conform to the following performance requirements:

(ii).1 Accommodate medium to heavy pedestrian traffic and up to the following weights for active leaf doors: 100 kg for locations as designated bi-part, 200 kg for single slide.
(ii).2 Sliding door operator, including the motion and presence detection system, will be capable of operating within the temperature ranges existing at the Facility site. The motion and presence detection system will be unaffected by ambient light or ultrasonic principles.
(ii).3 Energy saving device will be provided to reduce conditioned air loss.

(iii) Automatic swing doors will be used for interior and exterior locations as designated and will conform to following performance requirements:

(iii).1 Automatic door equipment will accommodate medium to heavy pedestrian traffic and up to 98 kg weight of doors.
(iii).2 Door operator for exterior locations will be capable of operating within temperature ranges existing at the Facility site.
(iii).3 Directional motion sensor control device, if used, will be unaffected by ambient light or ultrasonic frequencies.
(iii).4 All IN-swing doors, which are required exits, will be equipped with an emergency breakaway switch which internally cuts power to the operator. No external power switch will be allowed.

(f) Aluminum Curtain Walls

(1) Technical references

(A) Design of aluminum framing members will conform to CAN3-S157-M83 – Strength Design in Aluminum.

(B) Ventilator window units within curtain wall will conform to the performance levels of CAN/CSA-A440 Windows .

(C) AAS (Aluminum Association Standards).

(D) AAMA 503 Specifications for Field Testing of Metal Storefront, Curtain Wall and Sloped Glazing Systems.

(E) ASTM E283 – Standard Test Method for Air Infiltration of Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen.

(F) ASTM E330 – Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

(G) ASTM E331 – Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference.

(2) Performance Requirements.

(A) Aluminum finish for exposed aluminum surfaces will be permanent and resistant to corrosion resulting from exposure to weather and climate.

(B) Resist 1 in 100 year climatic events.

(g) Aluminum Windows

(1) Technical references

(A) Design of aluminum windows will conform to CAN3-S157 – Strength Design in Aluminum.

(B) CSA A440 – Windows.

Other reference standards will be as listed under (f) Aluminum Curtain Wall.

(2) Overriding Principles

(A) Exterior glazing by windows will be provided as part of the exterior envelope where vision from and natural light into interior spaces is required and where not provided by aluminum curtain wall or aluminum storefront.

(3) Performance Requirements.

(A) Aluminum finish for exposed aluminum surfaces will be permanent and resistant to corrosion resulting from exposure to weather and climate

(B) Resist seismic (post disaster building)

(C) Resist 1 in 100 year climatic events (with safety factor)

(h) Skylights

(1) Overriding Principles

(A) Roof or skylight glazing may be provided where natural light is required in interior spaces to augment or complement interior ambient lighting.

(2) Performance Requirements.

(A) Aluminum finish for exposed aluminum surfaces will be permanent and resistant to corrosion resulting from exposure to weather and climate

(i) Glass and Glazing

(1) Technical references

(A) Glass will be designed according to CAN/CGSB-12.20 with glass deflection limited to L/175, to a maximum of 20 mm for any single light of insulating glass.

(B) CAN/CGSB-12.1 – Tempered or Laminated Safety Glass.

(C) CAN/CGSB-12.3 – Flat, Clear Float Glass.

(D) CAN/CGSB-12.4 – Heat Absorbing Glass.

(E) CAN/CGSB-12.5 – Mirrors, Silvered.

(F) CAN/CGSB-12.8 – Insulating Glass Units.

(G) CAN/CGSB-12.9 – Spandrel Glass.

(H) CAN/CGSB-12.10 – Glass, Heat and Light Reflecting.

(I) CAN/CGSB-12.11 – Wired Safety Glass.

(J) CAN/CGSB-12.13 – Glass, Patterned.

(K) IGMAC “Glazing Recommendations for Sealed Insulating Glass Units”.

(L) IGMAC “Sloped Glazing Guidelines”.

(M) GCA Glazing Contractors Association of B.C. Glazing Systems Specifications Manual.

(2) Overriding Principles

(A) Exterior and/or interior glass and glazing may be provided as integral components of the exterior building envelope, interior partitions and screens, exterior and interior doors, handrail balustrades, skylights and decorative and ornamental glazing.

(3) Quality Requirements.

(A) Materials and workmanship will conform to Glazing Contractors Association of B.C. (GCA) Glazing Systems Specifications Manual and Insulating Glass Manufacturers Association of Canada (IGMAC) Guidelines.

(B) Glass and glazing work also to conform to good glazing practice as described in the IGMAC “Glazing Recommendations for Sealed Insulating glass Units”, IGMAC “Sloped Glazing Guidelines”, and the GANA “Glazing Manual”.

(4) Performance Requirements.

(A) Conform to the requirements of the tests and standards listed in Section 13.8(i)(3).

(B) Resist seismic (post disaster building).

(C) Resist 1 in 100 year climatic events (with safety factor).

(D) Laminated safety glass will be used in single glazed skylights, or as the inboard light of a double glazed skylight.

(E) Mirrors

(i) Full wall mirror:

Mirrors will be Type 1A in accordance with CAN/CGSB-12.5. Full wall unframed mirrors will be 6 mm thick minimum float glass backed with electrolytically applied copper plating. All exposed edges will be ground smooth and polished.

(ii) Wall mounted posture mirror:

Mirrors will be framed type; one piece, stainless steel channel frame with a No. 1 quality, 6 mm thick float glass mirror backed with electrolytically applied copper plating. Back to be galvanized steel.

(j) Finish Hardware

(1) Technical references

(A) ANSI - American National Standards Institute Standards.

(B) CAN4-S104M- Standard Method for Fire Tests of Door Assemblies.

(C) Recommended locations for Architectural Hardware as published by the Door and Hardware Institute (DHI).

(D) Installation of Commercial Steel Doors and Frames as published by the Door and Hardware Institute (DHI).

(2) Quality Requirements.

(A) (A) Hardware finish will be selected to provide maximum longevity and preservation of the finish.

(B) (B) Finish hardware, where applicable, will be ULC listed for fire rating for all functions up to 2-hour doors.

(C) (C) The installed door and frame assembly including the finish hardware and finish hardware installation will conform to NFPA No. 80 Standard for fire protection ratings as applicable.

(3) Performance Requirements.

(A) Finish hardware will be heavy duty commercial quality hardware.

(4) Keying

(A) Project Co will supply Primus EF Level 2 Cylinders

(B) Cylinder type to suit hardware function i.e. mortise, knob, lever, panic

(C) Keying to be 4-level system, i.e.:

(i) GGMK – same bittings as existing Primus GGMK

(ii) GM__ Building Master

(iii) MK__ Sub Master

(iv) ___ Change Key

(D) Keying groups to be assigned by the Authority

(E) New key bittings to be given to and controlled by the Authority

(F) Keys from factory to be given to the Authority

(G) Four (4) keys to be supplied for each lock cylinder

13.9 Finishes (Division 9)

(a) Basic requirements

(1) Interior wall, floor and ceiling finishes and assemblies to support finishes will be suitable for the requirements of the Facility as established by the Project Co in consultation with the Authority.

(A) Finishes and systems of installation in areas where water is anticipated to be present due to cleaning or as a product of procedures and process will be such as to allow water to collect and exist without causing damage to the finish or substrate.

(B) Areas where wear due to pedestrian or wheeled traffic is anticipated and is a concern will have finish materials which can withstand damage and can be replaced in sections with relative ease if damage occurs.

(C) Acoustic characteristics of finish materials will be a priority consideration.

(D) Appearance characteristics creating and promoting a natural healing environment, including non-glare producing finishes and colours that will reduce artificial lighting requirements will be a priority.

(E) Sustainability: select finish materials of low-emissivity and made from renewable resources

(b) Interior Wall Framing

(1) Technical references

(A) Lightweight steel studs and tracks for interior partitions are classified under CAN/CGSB-7.1-98 Lightweight Steel Wall Framing Components as non-load bearing steel studs and will be manufactured from steel sheet, coil or cut length to conform to ASTM standards listed under CAN/CGSB-7.1-98. For interior application, the steel will be protected from corrosion by a zinc coating at least meeting the requirements of ASTM A653/A653M.

(B) CSSB1 – Canadian Sheet Steel Building Institute Standards.

(C) CSA-S136 – Cold Formed Steel Structural Members.

(2) Quality Requirements

(A) Materials and workmanship for steel studs and furring and gypsum board ceiling suspension systems will conform to Association of Wall and Ceiling Contractors of B.C. (AWCC) Wall & Ceiling Specification Standards Manual (latest edition), Section 9.7 - Interior Steel Studs and Furring.

(B) Ceiling suspension systems for gypsum board ceiling will conform to AWCC Specification Standards Manual, Section 9.7, Item 5. Maximum spans for steel studs used as ceiling joists will conform to Table 9.7/7 in the Standards Manual. System design and components will meet seismic restraint requirements for a post-disaster building.

(3) Performance Requirements

(A) Steel stud framing construction will accommodate electrical, plumbing and other services in the partition cavity. Reinforce steel stud framing and provide backing as required to support fixtures, wall cabinets and other such items requiring wall fixing.

(B) In the design of steel studs for interior walls and partitions, due consideration will be given to differences in air pressure on opposite sides of the wall or partition which may result.

(c) Gypsum Board

(1) Technical references

(A) Gypsum board will conform to CAN/CSA-A82.27.

(B) Gypsum board application will conform to CSA-A82-31, or Gypsum Association GA216 specification.

(C) Fire rated Type ‘X’ and ‘C’ gypsum board assemblies will be tested assemblies in accordance with CAN/ULC S101 or ASTM E119, in conjunction with non load bearing steel studs.

(D) ASTM C36/C36M – Standard Specification for Gypsum Board.

(E) ASTM C360/C360M – Standard Specification for Water-Resistant Gypsum Backing Board.

(F) ASTM C1278 – Standard Specification for Fiber Reinforced Gypsum Panel.

(G) ASTM C1177 – Standard Specification for Glass Mat Water-Resistant Gypsum Backing Panel.

(H) ASTM C1178 – Standard Specification for Glass Mat Water-Resistant Gypsum Backing Panel.

(I) ANSI A118.9 – Cementitious Back Units (CBU).

(J) Use nothing less than 5/8” (16 mm) thickness gypsum board.

(2) Quality Requirements

(A) Materials and workmanship for gypsum board and accessories will conform to the Association of Wall and Ceiling Contractors of B.C. (AWCC) Wall & Ceiling Specification Standards Manual (latest edition), Section 9.6.

(3) Performance Requirements

(A) Glass mat water-resistant gypsum backing panels (tile backer board) will be used behind ceramic wall tile in showers or other wet areas.

(B) Reinforced cementitious board or cementitious backer unit (CBU) may be used as an alternative to glass mat water-resistant gypsum backing panels.

(C) Abuse-resistant gypsum board will be provided where required for increased resistance to abrasion, indentation and penetration for interior walls and ceilings.

(D) Glass mat surfaced gypsum sheathing board will be used wherever exterior gypsum sheathing is required at exterior walls.

(E) Gypsum board wall and ceiling assemblies to provide fire resistance ratings will be designed in accordance with the BC Building Code and will be ULC or Warnock Hersey listed.

(F) Where fire resistance rated gypsum wallboard assemblies are required, they will be constructed to applicable ULC or WHI listings.

(G) Control joints will be constructed as per recommendations of AWCC.

(d) Ceramic Tilework

(1) Technical references

(A) CAN/CGSB-25.20-95 – Surface Sealer for Floors.

(B) CAN/CSGB-75.1 – Moisture Resistance (MR) of glazed and unglazed ceramic tiles, Table 1 Water Absorption, Percentage by Mass.

(2) Quality Requirements.

(A) Materials and workmanship for ceramic tilework will conform to Terrazzo Tile and Marble Association of Canada (TTMAC) Specification Guide 09300 Tile Installation Manual (latest edition).

(3) Performance Requirement

(A) In order to reduce opportunities for the spread of infection, minimize use of ceramic tile in interior applications at patient and other clinical areas.

(B) Ceramic tile will meet the following performance standards as applicable:

(i) Static Coefficient of Friction: Floor tile installed on wet and exterior surfaces will have the following values as determined by testing identical products per ASTM C1028.

(i).1 Level Surfaces: Not less than 0.50 for wet and dry conditions.

(i).2 Step Treads: Not less than 0.60 for wet and dry conditions.

(i).3 Ramp Surfaces: Not less than 0.60 for wet and dry conditions.

(ii) Exterior tiles will be frost resistant and will have a moisture absorption rating of 3.0% or less.

(iii) Control joints and expansion joints will be provided in conformance with the recommendations of the TTMAC Tile Installation Manual.

(iv) Crack isolation membranes will be provided where necessary to resists crack transmission from the substrate due to lateral movement.

(e) Acoustical Ceilings

(1) Technical references

(A) Acoustic tile will be rated Class 25 (Incombustible) under Flame Spread Index Section of Federal Specifications 55-5-118a and have a Class 1 Flame Spread rating according to CAN/ULC-S102 or ASTM E84. Tile will also be listed and labelled by Underwriters Laboratories Inc or ULC, under Hazard Classification for a flame spread of 0-25.

(B) Acoustical ceilings will be installed in accordance with ASTM C636.

(C) Floor rate ceiling assemblies (including ceiling panels, suspension system, light fixtures, diffusers and structural components will be tested assemblies in accordance with CAN/ULC-S101 or ASTM E119.

(D) ASTM C423 – Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

(E) ASTM E90 – Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.

(F) ASTM E1414 – Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum (previously known as ASTM E413).

(G) CAN/CGSB-92.1 – Sound Absorptive Acoustical Units, Prefabricated.

(2) Overriding Principles

(A) General interior sound levels will be controlled to facilitate a comfortable and healing environment for patients and a safe working environment for Facility staff.

(B) Acoustic ceiling tiles in a suspension system will be installed where applicable to provide the levels of sound attenuation for particular applications as may be required.

(C) Ceiling tiles in a suspension system will provide accessibility to the ceiling spaces where regular or particular access is required to mechanical, electrical or other service systems.

(3) Performance Requirements

(A) Suspension systems for acoustic tile will conform to seismic restraint requirements of ASTM E580 Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Moderate Seismic Restraint.

(B) Components for ceiling suspension system will be “intermediate” system manufactured to meet ASTM C635 Suspension Systems for Acoustical Tile and Lay-In Ceilings, and will be formed from commercial quality zinc coated cold rolled steel, and to meet specifications for seismic restraint.

(C) Temperature and humidity affect acoustical panel and tile dimensional and planar stability. Standard acoustical panels and tiles designed for installation within the normal occupancy condition range of 150 C to 290 C and maximum 70% RH. When the service use temperature and RH are expected to exceed these ranges, consider the use of acoustical units specifically designed for these applications.

(D) In any area where lay-in ceiling panels frequently need to be removed for plenum access, tiles will be provided with surface scratch resistance.

(E) Ceilings installed in food preparation areas will be capable of being cleaned without undue wear on the tile.

(f) Flooring

(1) Technical references

(A) Carpeting will meet or exceed all requirements of the CGSB-4-GP-129 Standard for Carpets, Commercial and the Hazardous Products Act.

(B) Resilient stair treads and risers will conform to US Federal Specification RR-T-650d.

(C) ASTM F2034 – Standard Specification for Linoleum Sheet Flooring.

(D) ASTM F1344 – Standard Specification for Rubber Floor Tile.

(2) Overriding Requirements.

(A) Flooring finishes will be provided as required to comply with the functional and aesthetic parameters of the Authority as follows:

(i) The selection process for flooring materials will include considerations of cleaning and maintenance, pedestrian and rolling traffic, acoustics, infection control and aesthetics.

(ii) Epoxy flooring in all wet areas will be water resistant and slip resistant and will prevent water or moisture transmission to the substrate. Termination of the flooring at the walls in the form of 150mm high “flash coves” is required in these areas.

(iii) Flooring over which wheeled or service vehicle traffic is anticipated and where wear and damage may result will be heavy duty materials suitable for that purpose.

(iv) Flooring in areas subject to moisture and heat over extended periods of time will be permanent heavy duty integral materials such as seamless epoxy quartz flooring.

(v) Flooring in patient areas and staff areas where cart or stretcher traffic is expected or where cleaning on a regular or emergency basis is necessary will be of a quality suitable for that purpose.

(vi) Flooring in public washrooms, staff washrooms, patient washrooms will be impervious to water and have a slip resistant finish.

(vii) Resilient tile products will be considered as flooring in service corridors and service areas.

(3) Quality Requirements.

(A) Materials and workmanship for resilient flooring will conform to the National Floor Covering Association (NFCA) Specification Standards Manual.

(4) Performance Requirements

(A) Resilient Flooring

(i) Exposed surface will provide anti-bacterial activity against gram-positive and gram-negative micro-organisms. All seams will be welded. Areas surfaced in sheet flooring will have integral cove bases.

(ii) Linoleum sheet flooring will be a homogenous sheet linoleum of primarily natural materials, consisting of linseed oil, wood flour and resin binders mixed and calendared onto a natural jute

backing. All seams will be welded. Areas surfaced in sheet flooring will have integral cove bases.

(iii) Rubber flooring tile will be formulated with 100% virgin elastomers, reinforcing agents, soil-resisting agents and migrating waxes compounded to afford the end user benefits of long durability, excellent cleaning characteristics and exceptional slip resistance. Stud designs will have chamfered edges with a sharply defined edge at the top, for higher slip resistance, easier cleaning and superior maintenance and low vibration design to minimize vibration and noise. Areas surfaced with resilient tile flooring will have rubber bases.

(iv) Tactile warning strips and stair nosing will be provided to assist the visually impaired.

(v) Adhesive for resilient flooring will meet or exceed EPA Standards for acceptable VOC concentration and emission rates.

(B) Seamless Quartz Epoxy Flooring

(i) Seamless epoxy flooring will be 100% solids, zero VOC, solvent free system comprised of a two-component epoxy primer, a two-component epoxy resin and curing agent, coloured quartz aggregate broadcast into both primer and undercoat and a high performance UV resistant two-component, clear epoxy sealer. Bases will be integral cove bases.

(g) Acoustic Treatment

(1) Technical references

(A) ASTM C423 – Standard Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Method.

(B) ASTM E84 – Test Method for Surface Burning Characteristics of Building Materials.

(C) ASTM E90 – Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions

(D) ASTM E336 – Test Method for Measurement of Airborne Sound Insulation in Buildings.

(E) CAN/ULC-S101 – Fire Endurance Tests of Building Construction and Materials.

(F) CAN/ULC-S102 – Test for Surface Burning Characteristics of Building Materials and Assemblies.

(2) Overriding Principles.

(A) Acoustic treatment will be provided where sound attenuation, soundproofing or other sound control measures are necessary to create a healing environment for patients and a safe and comfortable environment for staff.

(B) Sound control will include:

(i) Attenuation of sound within public, patient and staff environments.

(ii) Sound isolation between the exterior and interior spaces.

(iii) Sound isolation between interior spaces within the Facility at both horizontal and vertical separations.

(iv) Sound and vibration isolation of building services noises and sound isolation of building services rooms.

(3) Quality Requirements

(A) Refer to Table 12.4: Sound Transmission Limitations in Section 12.4 of this Schedule.

(4) Performance Requirements

(A) Partition and ceiling construction will provide approximately the same degree of sound control through each assembly. When partition is used for sound isolation, the sound control construction will extend from slab to slab.

(B) As a general principle, optimum sound isolation requires that the integrity of gypsum board partitions and ceilings (mass) never be violated by cutting out for vents or grilles or by recessing cabinets, light fixtures, etc.

(C) Where penetrations are necessary, placing them back to back and next to each other will be minimized. Electrical boxes will be staggered, preferably at least one stud space. Mineral fibre insulation should be used to seal joints around all cutouts, such as electrical, TV and telephone outlets, plumbing escutcheons, recessed cabinets and bathtubs.

(D) Constructions such as ducts, rigid conduits or corridors, which act as speaking tubes to transmit sound from one area to another will be minimized. Common supply and return ducts will have sound attenuation liners at the diffuser and/or grill to maintain assemblies STC. Conduit will be sealed.

(E) To isolate structure-borne vibrations and sound, vibrating equipment will have resilient mountings to minimize sound transfer to structural materials. Ducts, pipes and conduits will have resilient, non-rigid boots or flexible couplings where they leave vibrating equipment; and they should be isolated from structure with resilient gasketing and sealant where they pass through walls, floors or other building surfaces.

(F) Use acoustic screens, vibration isolators and carefully selected exterior equipment to prevent exterior noise that the Royal Jubilee neighbours may find offensive

(h) Painting and Protective Coatings

(1) Overriding Principles

(A) All exterior and interior finish materials will have surface finishes either as manufactured and integral to the finish material or as applied to the surface of the finish material by paint or special coating.

(B) Exterior paints and painting will be of a quality to protect the substrate materials from the conditions of weather and climate existing at the site and environs of the Authority.

(C) Exterior masonry materials such as brick and concrete block will be treated with water repellent coatings to prevent water ingress into or through the material.

(D) In patient, staff and public interior areas, indoor air quality will be a priority and paints and paint materials will have a minimum volatile organic compound level.

(E) All painted patient areas must be painted with a semi-gloss finish

(F) Exterior and interior materials subject to corrosion from exposure to moisture or other corrosive agent and where painting is deemed to be insufficient protection will receive a special protective coating. Such materials include exterior and interior structural and miscellaneous steel and galvanized steel.

(G) Achieve a harmonious and coordinated appearance across all areas of the Facility.

(H) Handrails, doors and frames must be painted a contrasting colour from walls in consideration of the visually impaired.

(2) Quality Requirements

(A) Materials and workmanship will conform to the Master Painters Institute (MPI) Architectural Painting Specification Manual (latest edition).

(3) Performance Requirements

(A) All paint materials will also have been rated under Environmental Notation System (ENS) with acceptable VOC ranges as listed in the MPI Approved Product List under “E” ranges.

(B) All materials used will be lead and mercury free.

(C) Use only materials having a minimum MPI “Environmentally Friendly” E2 rating based on VOC (EPA Method 24) content levels.

(D) Use only MPI listed materials having a minimum E2 rating.

(E) Seamless epoxy wall coatings will be a two component, high solids, Zero or low VOC, solvent free, epoxy glaze wall coating which will be seamless, abrasion and chemical resistant, and UV resistant. Coating will have been tested in accordance with ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.

(i) Special Wall Coverings

(1) Overriding Principles

(A) Interior walls may require wall coverings to satisfy aesthetic or appearance considerations beyond the application of paint. These considerations may add to the creation of healing environment in patient areas, in the creation of comfortable working environment in staff work areas and safe and inviting environment in public areas.

(B) Wall coverings are not recommended in areas which may have excessive moisture present or those areas requiring high and frequent maintenance.

(2) Quality Requirements

(A) Materials and workmanship will conform to the Master Painters Institute (MPI) Architectural Painting Specification Manual (latest edition).

(B) Sealers and adhesives will be non-toxic, water based type and will meet requirements of Canadian “Eco Logo” program or equivalent. TVOC emissive content will not be more than 20 grams per litre.

13.10 Manufactured Specialties (Division 10)

(a) Tackboards and Whiteboards

(1) Overriding Principles.

(A) Tackboard surfaces will be of a type and quality to allow pin penetration of the surface materials while allowing reasonable resistance to deterioration.

(B) Whiteboard surfaces will be of a type to allow use of felt type writing instruments and allow erasing and cleaning with minimum effort.

(2) Performance Requirements

(A) Tackboards and whiteboards will be complete with manufactured frames and accessory trays as and where required.

(B) Whiteboard writing surface will be porcelain ceramic on steel surface, magnetic, and with maximum contrast, glare control and reflectivity, and will be scratch and abrasion resistant.

(C) Lamination adhesive used for tackboards and whiteboards will be non-toxic water based adhesive.

(b) Compartments and Cubicles

(1) Overriding Principles.

(A) Compartments and cubicles will include toilet partitions, change cubicle and shower partitions and other compartments and cubicles requiring privacy and security.

(B) Exposed surfaces will be permanent, water resistant, corrosion proof and readily cleaned and maintained.

(C) Partitions and standards will be secured to the floor or secured to the ceiling structure and resistant to lateral loading and impact.

(D) Compartment/cubicle doors, where used, will be of material matching the partitions and will be complete with permanent, purpose made hardware. Doors and hardware will provide privacy and security and will be handicap accessible where required.

(E) Curtain track and curtain may be used in lieu of door where and as appropriate.

(F) Change compartments will be complete with a mirror.

(2) Quality Requirements

(A) Toilet Partitions

(i) Sheet metal where used for toilet partitions will be galvannealed steel conforming to ASTM A653 with minimum ZF001 (A01) zinc

coating. Finish for steel surfaces will be polyester baked enamel.

(ii) Stainless steel used for partitions will be Type 304 conforming to ASTM A240 with No. 4 finish.

(iii) Plastic laminate used for partitions will be Grade 10/HGS GP50 scuff resistant high pressure laminate, conforming to NEMA LD-3.

(iv) Fiber reinforced plastic (fibreglass) will be moisture resistant.

(v) Particleboard core for partitions will conform to CAN3-0188.1 Industrial Grade "R".

(B) Shower Partitions

(i) Partitions for showers will conform to CAN3-A172 or NEMA LD3.

(c) Wall Guards and Corner Guards, Handrails, Wall Protection, Door Edge and Door Frame Protection

(1) Overriding Principles

(A) Wall and corner guards:

(i) Select wall guards and corner guards of materials appropriate to the amount and degree of impact anticipated in the areas noted above.

(ii) Wall guards and corner guards used for the above purposes will be secured to reinforcing and backing in the walls sufficient to withstand expected impact loads.

(B) Handrails:

(i) Provide handrails in corridors and other patient areas for patients requiring support.

(C) Wall Protection:

(i) Apply sheet wall protection to wall areas where impact damage is anticipated over a larger area of wall than will be protected by bumper guards.

(ii) Apply sheet wall protection to faces of doors where impact damage is anticipated. Sheet wall protection on doors may complement the installation of door edge and frame protection.

(D) Door Edge and Door Frame Protection:

(i) Protect door edges and door frames in inpatient areas from damage caused by impact by stretcher movement and regular movement of other wheeled vehicles.

(ii) Protect door edges and door frames in service areas from damage caused by impact by regular and non regular miscellaneous service vehicles.

(2) Quality Requirements

(A) Bumper guards, crash rails, handrails and corner guards will be high impact resistant extrusion conforming to ASTM D4226 and with anti-microbial additive.

(B) Wall protection will be high impact stain resistant conforming to ASTM D4226 with anti-microbial additives.

(3) Performance Requirements.

(A) Wall protection handrails and corner guard products will be stain resistant to pen marks, paint and graffiti, and will withstand commercial cleaners without fading or staining. These products will also contain anti-microbial additives to retard mildew and bacterial growth.

(d) Metal Lockers

(1) Overriding Principles.

(A) Individual and shared storage facilities will be provided for securing the personal effects of Facility staff in designated staff areas and patients in appropriate secure areas accessible to patients.

(B) Such storage facilities may be metal lockers and metal locker systems of sizes, numbers and groupings as appropriate for the numbers and functions as determined by Project Co in consultation with the Authority.

(2) Quality Requirements

(A) Sheet metal where used for metal lockers will be galvannealed steel conforming to ASTM A653 with ZF001 (A01) zinc coating.

(B) Finish for steel surfaces will be polyester baked enamel.

(3) Performance Requirements.

(A) Single, double or multiple tier metal lockers for staff use complete with provision for locking with padlock, number plates, hanging hooks.

(B) Single, double or multiple tier metal lockers for patients with coin and key operated locks.

(e) Storage Shelving Systems

(1) Overriding Principles

(A) Facilities for materials storage will be provided in designated storage areas.

(B) These storage systems or facilities may be provided by adjustable shelving systems specifically manufactured for such storage purposes.

(f) Quality Requirements

(1) Performance Requirements.

(A) Mobile storage systems for files will be high density system designed to make maximum use of available space by eliminating need for access aisle for each run of shelving. System must be installed and braced to resist seismic loads.

(g) Washroom Accessories

(1) Overriding Principles.

(A) Accessories as required for washroom functions will be provided to public, patient, and staff washrooms. Type, size, number of accessories will be determined from the numbers and categories of users.

(B) Washroom accessories will include but are not limited to the following:

(i) Staff and Public Washrooms
- (i).1 Soap dispensers
- (i).2 Toilet paper dispensers.
- (i).3 Sanitary napkin dispenser
- (i).4 Sanitary napkin disposals
- (i).5 Paper towel dispensers
- (i).6 Paper towel disposals
- (i).7 Mirrors
- (i).8 Handicap grab bars
- (i).9 Coat hooks

(ii) Patient Washrooms
- (ii).1 Soap dispensers
- (ii).2 Toilet paper dispensers
- (ii).3 Handicap grab bars
- (ii).4 Paper towel dispensers and receptacles
- (ii).5 Mirror

(ii).6 Coat hook

(iii) Shower rooms or showers in washrooms will be provided with:

(iii).1 Shower curtain track or rod as appropriate.

(iii).2 Handicap grab bars.

(C) Washroom accessories with appropriate safety features will be selected for Mental Health/Psychiatry and other areas where there is increased risk of patient injury.

(D) Do not use recessed dispensers (example: paper towels, waste receptacles, soap).

(2) Performance Requirements.

(A) Accessories will be best grade, entirely free from imperfections in manufacture and finish.

(B) The washroom accessory and installation will allow cleaning and maintenance of the accessory and the surrounding wall area.

(C) Fittings will be concealed type for security and to discourage tampering.

(h) Privacy Curtain Tracks

(1) Overriding Principles

(A) All single patient bedrooms will have a privacy curtain just inside the doorway. Double patient rooms will have privacy curtains around each bed.

(2) Performance Requirements

(A) Project Co will provide:

(i) cubicle tracks that are extruded, anodized aluminum, entirely enclosed, except for slot in bottom and

(ii) cubicle carriers composed of a non-binding, abrasion-resistant, nylon block supported from self-lubricating bearings by two nylon wheels and contain a free-moving plated swivel-hook assembly. One end of each track will be fitted with a removable end stop to permit simple carrier replacement. Splicing clamps will be of anodized aluminum. Curves will be factory-curved.

(i) Projection Screens

(1) Overriding Principles

(A) Screens to be fully recessed heavy duty type for electrical operation

(2) Quality Requirements

(A) Screen to be listed by Underwriter's Laboratories and CSA

(3) Performance Requirements

(A) Motor to be quick reversal type especially designed for the purpose, to be ball bearing and oiled for life, with automatic thermal overload cutout and integral interlocking gears with preset but adjustable limit switches to automatically stop screen fabric in the up and down positions. Stop action to be positive to prevent coasting. Roller to be mounted on two heavy-duty brackets equipped with self-aligning bearings.

(B) Screen surfaces to be flame retardant and mildew resistant.

(C) Motor compartment to be metal lined.

13.11 Equipment (Division 11)

(a) Patient Lifts

(1) Quality Requirements

(A) All work to be done in accordance with the requirements of the Canadian Electrical Code (CEC), Canadian Standards Association (CSA) and all governing local and Provincial regulations.

(2) Performance Requirements

(A) Ceiling mounted lift design and specification will be determined by Project Co in consultation with the Authority.

(B) Ceiling mounted patient lift systems will provide mechanical assistance to staff in the movement of patients in prone or sedentary positions.

(C) The pick-up and drop-off location for each patient track installed will be reviewed and approved by the Authority Wellness & Safety (OHS) department prior to installation.

(D) The patient lift systems will be at locations as required by the specific and particular requirements of the Facility and Appendix 3A.

(E) Coordinate the 'parked/charging' location of the lift with all clinical and housekeeping activities in the patient bedroom. Charging station is not to be located above the patient bed.

(F) Inpatient room tracks must have a capacity of 800lbs unless otherwise indicated for the room type, e.g. bariatric rooms.

(G) Inpatient room tracks will not obstruct (partially or completely) over-bed, ceiling mounted light fixtures.

(H) The patient lift system will be electrically operated.

(I) See Section 13.16 regarding electrical requirements for charging station location; ensure receptacle is ceiling or wall flush mounted.

(b) Fall Protection and Anchors

(1) Overriding Principles

(A) System to be provided to be a safety tie-back and life line anchors and horizontal life line system and associated equipment for safe building maintenance operations including window-washing.

(2) Performance Requirements

(A) Fall protection system will be designed and engineered to protect workers from free falling a vertical distance greater than 1200 mm.

(B) Fall protection system will include all hardware and lanyards attached to the horizontal lifeline system complete with body harness.

(c) Window Washing Systems

(1) Provide equipment or appropriate anchors to facilitate window washing.

13.12 Furnishings (Division 12)

(a) Project Co will provide window coverings and miscellaneous accessories as required for the Facility.

(b) Window Coverings

(1) Overriding Principles

(A) Window coverings will allow control of exterior light entering the room during daylight hours and provide privacy during daylight and non-daylight hours.

(B) Window coverings may be required to provide black out functions and if so required, materials, tracks, seals and operation will be appropriate to this purpose.

(C) Window coverings will be designed and manufactured using materials and mechanisms which would minimise cleaning and maintenance operations and maximize infection control.

(D) Window coverings will be designed to minimize light spillage onto residential areas.

(c) Quality Requirements

(1) Performance Requirements

(A) Window Shade Systems

(i) Shading fabric will be waterproof, washable, rot proof, flame resistant, fungal and bacteria resistant, colourfast to light and will control heat gain and provide external visibility and reduction of glare.

(ii) Shading fabric for window shade systems will pass Small Scale Vertical Burn requirements in accordance with CAN/ULC-S109 or NFPA-701.

(iii) Shading fabric for window shade systems will have been tested in accordance with ASHRAE Standard 74073 for shading coefficient, for fungal resistance in accordance with ASTM G21, and for bacterial resistance.

(B) Venetian Blinds

(i) Venetian blinds will be hand operated, horizontal louver blinds with spring tempered aluminum alloy slats with baked enamel finish.

(ii) Blinds will have high tenacity woven polyester fibre lift cords, electro-galvanized coated head channel and bottom rail, and cord lock.

(C) Vertical Blinds

(i) Vertical blinds will be mono-control single cord vertical blind system to provide rotating and traversing action. Vanes to be aluminum alloy with baked enamel finish, or fabric. Fabric will be waterproof, washable, Vertical blinds will be mono-control single cord vertical blind system rot proof, flame resistant, colour fast to light, and fungal and bacteria resistant.

(D) Venetian Type Between Glass Blinds

(i) These blinds will consist of slats uniformly spaced and 100% interlaced between cross-ladders on at least one tape. The attachment directly to the of the suspension members from the window opening to the blind will be tapes with no special end rails required.

(ii) There will be no openings in the glazing plane.

(iii) The slats will be tempered aluminum alloy.

(iv) The operator will be a specially constructed permanent magnet capable of moving the blind assembly from a closed position in one direction to a closed position in the opposite direction.

(E) Miscellaneous Accessories

(i) Provide the following accessory items as applicable:

(i).1 Countertops and splashbacks
(i).2 Service fittings.
(i).3 Drying racks.
(i).4 Pegboards.
(i).5 Framed sliding glass doors.
(i).6 Sliding glass doors.
(i).7 Open storage units.
(i).8 Emergency eye wash.
(i).9 Emergency shower head.
(i).10 Safety shower station.
(i).11 Bin cabinets.
(i).12 File drawer cabinets.
(i).13 Mobile cabinets.

13.13 Special Construction (Division 13)

Not used.

13.14 Conveying Systems (Division 14)

(a) Elevators

(1) Performance Requirements

(A) Elevator work will be designed, fabricated and installed in accordance with the following standards and regulations:

(i) Stainless steel finishes will be ASTM type 304, brushed or satin finish, X-L Blend S, or X-L Buff finish, to manufacturer's standard.

(ii) The Interior dimensions and weight capacities of each car will accommodate all equipment and materials including Bariatric, O/R, and Critical Care beds and stretchers (including portering attendees and associated equipment) that are to be expected to be found in a first class acute care hospital.

(iii) Canadian Standards Association, B44-07 Safety code for elevators and escalators.

(2) Appendix E Compliance

(A) All elevators will be designed in full compliance with B44 Appendix Section E, including the provision of audio voice annunciation.

(3) Central Monitoring Equipment

(A) Provide elevator monitoring system, complete with two (2) desk top PC complete with LCD monitor, colour printer, and intranet network connectivity. One unit will be installed in the hospital security office, the second will be provided for the facility management office. Provide in each machine room PC laptop unit, with 380 mm LCD screen, capable of displaying information of all elevating devices within the Facility.

(B) Monitoring system will be network based and expandable permitting monitoring and remote control of all vertical transportation equipment within the Facility.

(4) Card Reader Security Provisions

(A) Each Service and Passenger elevator will be provided with card reader security access. Proximity type reader will be used. Provide each elevator with necessary shield wiring, security interface interconnections, plus over ride key switch. Over ride key switch will allow persons to cut out security operation on a Bank by Bank basis, as well as car by car. Key switches will be provided in CACF room. Card reader interface will allow for a programmable delay, minimum 1 to 5 seconds, following registration of access card, to allow passengers to register their landing call.

(5) CCTV Provisions

(A) Each Service and Passenger elevator will be designed to accommodate CCTV surveillance equipment. Provide two cables sufficient to meet CCTV Camera transmission requirements running, without splices or breaks, between a junction box mounted on the side of each car controller to a junction box mounted on the car top. At the car end, leave at least 2 metres spare cable length to facilitate camera hook up. On Car top, provide a junction box, complete with a 120 volt power circuit

designed to interconnect camera power supply transformer. Power supply circuit for camera will not be connected to car cab light and fan power supply. Provide separate 120 VAC feed for this service. Mark car top box as CCTV camera.

(6) Proprietary Equipment / Prototype Equipment

(A) Provision of proprietary equipment, limited or restricted access software and diagnostic tools, or equipment designed with automatic "time out" or "shut down" features will not be accepted. Provide the Authority with all diagnostic tools, equipment, software and manuals to allow others to undertake equipment maintenance other than the original installer.

(B) Under no circumstances will prototype components or equipment be provided. Use only equipment that has shown a proven track record for the application intended.

(7) Description of Equipment

(A) Passenger Elevator Group

(i) Number – Four elevators

(ii) Designations – P1 to P4

(iii) Number of Entrances – Nine (9) in line for four cars (elevators serving Basement, Level 1, Level 2, Level 3, Level 4, Level 5, Level 6, Level 7, and Level 8) assuming an eight-storey building

(iv) Equipment type – overhead gearless traction passenger

(v) Type –Traction Passenger

(vi) Capacity – 1,815 kg / 25 persons, Class A loading on all four cars

(vii) Rated Speed – 2.54 metre per second

(viii) Control – AC VVVF

(ix) Operation – Group Supervisory, full collective

(x) Operating Features

(x).1 Independent Service
(x).2 Card Reader Security Provisions
(x).3 Firefighters' Emergency Operation, Phase 1 and 2
(x).4 Emergency Power, automatic sequencing (one car to operate at a time)

(x).5 Code Blue, cardiac emergency service, Phase 1 and Phase 2
(x).6 Remote Monitoring and Remote Control
(x).7 Load weighing dispatch and bypass
(x).8 Anti Nuisance operation
(x).9 Provision for CCTV cameras in elevator
(x).10 Provision to accommodate “Wandering Patient” alarm and interface to lock down elevator when alarm is activated.

(xi) Entrance Type – Horizontal Slide, Centre Opening

(xii) Entrance Size – a minimum of 1,220 wide x 2,135 high (dimensions in mm) on four cars

(xiii) Entrance Frames – 3 piece bolted with stainless steel clad landing door panels and entrance frames at all levels. Provide aluminium sills at all landings.

(xiv) Door Operator – GAL MOVFR or equivalent closed loop, heavy duty design

(xv) Minimum 250 mm diameter roller guides for cab and 75 mm roller guides for counterweight. Provide counterweight with equalizing springs to facilitate rope tension adjustments.

(xvi) Door Protection – Multi beam infra red detector – use of 3D sensor feature will not be accepted. Automatic shut down of elevator following three successive nudging applications will not be accepted.

(xvii) Signals and Fixtures
(xvii).1 Two risers of hall buttons at each landing – risers to be installed on opposite sides of the core, between adjacent pairs of elevators
(xvii).2 Hall lantern fixtures, designed to allow for 180 degree viewing of car direction indicator
(xvii).3 Battery power cab lighting, with one fixture set within each car station panel. Provide test facility within car service cabinet.
(xvii).4 Two speed cab ventilation fan, with fan.
(xvii).5 Two car operating panels per car
(xvii).5.1 One position indicator per panel
(xvii).5.2 Hands free two way voice communication
(xvii).5.3 Flush mounted service cabinet within one car operating panel.
(xvii).5.4 Card reader device mounted in one panel.

(xvii).6 Car call buttons to be US 91 BB Series or equivalent, complete with dual light illumination. Hall call buttons to illuminate green to indicate UP calls and red for DOWN. All car and hall call button illuminations to be LED type.

(xviii) Elevator Cab Interior Finishes

(xviii).1 Durable, cleanable and attractive interior finishes incorporating wayfinding directions.
(xviii).2 Sound isolated car platform.
(xviii).3 Platform and car frame suitably reinforced and designed to accommodate cab finish weight allowance of 1,500 kg per cab, including stone flooring tile.
(xviii).4 Minimum 2,440 clear inside cabin height.

(B) Service Elevator Group

(i) Number – Four elevators

(ii) Designations – S1 to S4

(iii) Number of Entrances – Nine (9) in line for three cars (elevators serving Basement, Level 1, Level 2, Level 3, Level 4, Level 5, Level 6, Level 7, and Level 8) assuming an eight-storey building. Ten (10) entrance openings for one car, serving same entrances as the other three cars plus one additional stop at the mechanical level penthouse

(iv) Equipment type – overhead gearless traction passenger

(v) Type –Traction Passenger

(vi) Capacity – 2,720 kg / 37 persons, Class A loading on three cars, and Class C3 loading on elevator that serves the Mechanical Penthouse. C3 loading to be designed to accommodate single piece load equal to full car carrying capacity.

(vii) Rated Speed – 2.54 metre per second

(viii) Control – AC VVVF

(ix) Operation – Group Supervisory, full collective

(x) Operating Features

(x).1 Independent Service
(x).2 Card Reader Security Provisions
(x).3 Firefighters' Emergency Operation, Phase 1 and 2

(x).4 Emergency Power, automatic sequencing (one car to operate at a time)
(x).5 Remote Monitoring and Remote Control
(x).6 Load weighing dispatch and bypass
(x).7 Anti Nuisance operation
(x).8 Provision for CCTV cameras in elevator
(x).9 Code Blue, cardiac emergency service, Phase 1 and Phase 2. Provision to be installed on all four service cars.
(x).10 Provision to accommodate “Wandering Patient” alarm and interface to lock down elevator when alarm is activated. Provision of “Wandering Patient” equipment is not the responsibility of the elevator installer.

(xi) Entrance Type – Horizontal Slide, Centre Opening, two speed

(xii) Entrance Size – a minimum of 1,830 wide x 2,135 high (dimensions in mm) on for cars

(xiii) Entrance Frames – 3 piece bolted with stainless steel clad landing door panels and entrance frames at all levels. Provide aluminium sills at all landings

(xiv) Door Operator – GAL MOVFR or equivalent closed loop, heavy duty design

(xv) Minimum 250 mm diameter roller guides for cab and 75 mm roller guides for counterweight. Provide counterweight with equalizing springs to facilitate rope tension adjustments.

(xvi) Door Protection – Multi beam infra red detector – use of 3D sensor feature will not be accepted. Automatic shut down of elevator following three successive nudging applications will not be accepted.

(xvii) Signals and Fixtures
(xvii).1 Two risers of hall buttons at each landing – risers to be installed on opposite sides of the core, between adjacent pairs of elevators. Code Blue Phase 1 recall control key switch to be mounted within one separate fixture at each landing level.
(xvii).2 Hall lantern fixtures, designed to allow for 180 degree viewing of car direction indicator
(xvii).3 Battery power cab lighting, with one fixture set within each car station panel. Provide test facility within car service cabinet.
(xvii).4 Two speed cab ventilation fan, with fan.

(xvii).5 Two car operating panels per car mounted in cab side walls adjacent to car entrance opening. Panels will be recessed mounted in side walls.
(xvii).5.1 One position indicator per panel
(xvii).5.2 Hands free two way voice communication
(xvii).5.3 Flush mounted service cabinet within one car operating panel.
(xvii).5.4 Card reader device mounted in one panel.
(xvii).6 Car call buttons to be US 91 BB Series or equivalent, complete with dual light illumination. Hall call buttons to illuminate green to indicate UP calls and red for DOWN. All car and hall call button illuminations to be LED type.

(xviii) Elevator Cab Interior Finishes

(xviii).1 Raised stainless steel side and rear wall panels, clad in Rigitex 5WL textured stainless steel. Provide raised panels with stainless steel binder strips and reveals. Provide stainless steel kickplate. Provide cove ceiling with indirect cab lighting consisting of energy efficient fluorescent or LED lighting. Provide single sheet lino flooring with radiused base around cab side and front return walls.
(xviii).2 Sound isolated car platform.
(xviii).3 Provide aluminium cab door sill.
(xviii).4 Minimum 2,440 clear inside cabin height.

(8) Installation

(A) Arrange equipment within machine room spaces provided. Position components so as to allow for future replacement or repair work to be undertaken, without having to dismantle or relocate other machine room equipment.

(B) Ensure all controllers, disconnects and other electrical devices are positioned so that their access panels can be fully opened without making contact with adjacent machine room devices or equipment whether installed under this Section or by others.

(C) Make available to appropriate trade signal fixture back boxes, sleeves, anchors or templates in advance of required construction.

(D) Electrical will provide wiring and conduit from electrical disconnects to car controller. Co-ordinate with Electrical section regarding the location of controller and electrical connection routing.

(E) Provide suitable rail bracket fasteners and make secure attachments to hoistway construction.

(F) Set entrance frames in proper alignment with car platform. Fasten frames to available wall and floor supports.

(G) Install entrances so frames are plumb within maximum variation of 1.5 mm measured between entrance landing sill and header, top to bottom.

(H) Install hoistway fascia panels in vertical alignment with entrances. Provide stiffeners and additional brackets to prevent fascia panels, where provided, and hanger covers from warping.

(I) Exposed Work within car enclosure and hall landing entrances will be fabricated in true planes. Metal and wood sections will be installed flat, be securely fastened and aligned to be straight and true. They will be free of visible imperfections. Joints will be accurately fitted, aligned and installed in same plane.

(9) Wiring

(A) Tie wrap all conductors.

(B) Spare conductors will be wrapped together and labelled with their ends insulated.

(C) Wiring connections will be soldered or fastened to terminal strips or studs using approved mechanical fasteners.

(D) Provide wiring harness where multiplicity of conductors are terminated at remote panel terminal strips.

(E) Controller components will be clearly marked with designations corresponding to those used on electrical circuit drawings.

(F) Provide insulated bushings around openings where travelling cable and other conductor cables are run through rigid structure or panels.

(G) Provide for each elevator, six pair shielded wires for future use. Wiring will run between terminal strip in car controller to a car top junction box mounted either on the top of the elevator cab or behind one car operating station panel back box terminal strip.

(H) Wiring connections to door detectors will be protected from chaffing and splitting. Flexible power cord may be used between fixed car wiring and car door detectors as long as its cover is suitably protected.

(I) Run hoistway wiring within conduit or troughing.

(J) All car top and hoistway wiring will be properly secured and neatly arranged using a minimum amount of flexible armoured conduit.

(K) Where armoured flexible conduit is used, provide conduit supports and fastenings at intervals of not more than 1500 mm.

(L) Use proper anti shorts in all conduit connections.

(M) Terminate all spare wires and terminal strip mounted within controller, or neatly secure and bundle up loose conductors into one neat coil.

(N) Install all raceway covers and secure in place all duct covers, fittings and fasteners.

(O) Retorque all wiring terminals to ensure a positive connection between conductor and terminal fastener is attained.

(10) Touch Up and Cleaning

(A) Remove from all polished metal surfaces, protective wrapping. When the failure to remove properly protective all wrapping from moving parts causes scratches or other blemishes in polished metal work visible to the public, the elevator installer will be responsible to remove damaged cladding and provide new replacement cladding.

(11) Painting

(A) All exposed ferrous metalwork will be painted with rust inhibiting paint.

(B) Paint exposed edges of platform and non-polished metal portions of the car.

(C) Prime coat painted surfaces will be finished in manufacturer's standard enamel finish.

(D) Factory applied finish paint will be touched up where damaged. Do not paint over equipment data tags or nameplates.

(E) Apply mechanically reproduced car number designation to controller, drive motor and brake housing after finish coat painting.

(F) After installation of equipment, paint fascia, toe guard and car apron panels flat black.

(12) Equipment Performances and Adjustment Settings

(A) Elevator will start within 0.5 seconds after door interlock is made up.

(B) Passenger & Service Elevator door open times will be set at:

(i) 1,220 mm wide centre opening doors: 2.0 to 3 seconds.

(ii) 1,830 mm wide two speed centre opening doors: 3.0 to 4 seconds.

(C) Passenger & Service Elevator door close times will be set at:

(i) 1,220 mm wide centre opening doors: 2.5 to 3 seconds.

(ii) 1,830 mm wide two speed centre opening doors: 4.0 to 5 seconds.

(D) Passenger & Service Elevator door close times under nudging operation will be no less than 1.75 times normal door close times as noted above

(E) Dwell time for car calls will be adjustable from 0 to 20 seconds, initially set at:

(i) Passenger Elevators: 1.5 to 2.0 seconds.

(ii) Service Elevators: 3.0 to 5.0 seconds.

(F) Dwell time for hall calls will be adjustable from 0 to 20 seconds, initially set at:

(i) Passenger Elevators: 3.0 to 5.0 seconds.

(ii) Service Elevators: 6.0 to 10.0 seconds.

(G) Flight times for each passenger and service elevator, measured under varying car load conditions and direction of travel will be set between the following limits. Flight time performances will be measured from the start of door closure at one landing and will stop at the point where the car doors are three quarters open and the car has levelled into an adjacent typical floor. Flight times are based upon 4.2 metres floor to floor height.

(i) Passenger Elevators: .5 to 9.5 seconds.

(ii) Service Elevators: .0 to 11.0 seconds.

(H) Door recycle time will be adjustable from 0 to 20 seconds.

(I) Load weighing will be adjustable from 40 to 85 percent and will initially be set at 60% of rated capacity.

(J) Anti nuisance feature, where controlled by load, will be adjustable from 0 to 50 percent and will initially be set at 5% of rated capacity.

(K) Car levelling accuracy will be maintained at +/- 3 mm under all load conditions.

(L) Car rated speed performance will be initially adjusted to attain a maximum speed variation of +/- 1.5% under full load conditions where full speed operation is achievable.

(b) Pneumatic Tube System

(1) Project Co will provide a pneumatic tube system that is fully compatible with the Authority's pneumatic tube system and that connects to the Authority's pneumatic tube system at the end of the Diagnostic and Treatment Building service tunnel adjacent to the Facility.

(2) Overriding Principles

(A) The system will be a computer controlled pneumatic tube materials distribution system consisting of tubing, stations, transfer units, blower packages, carriers and a control system, all fully compatible and connected to the existing Trans-Logic/Swiss-Log system in Diagnostic and Treatment building.

(3) Performance Requirements.

(A) The system will be configured in groups of stations (zones) connected together by interzone tubes. Each station will be connected to the system by a single tube to a transfer unit. Each nursing unit (patient care unit) will have at least one station.

(B) Each zone will contain its own blower and function independently.

(C) The dispatching, routing and storage of carriers will be directed by a system control centre to provide automatic unattended transmission of carriers between two stations.

(D) The system will provide shortest route vacuum pressure travel.

(E) Refer to "Pneumatic Tube System – Existing RJH Diagnostic and Treatment Building Riser Diagram" attached to June 2007 letter from Zeidler Partnership for locations and numbers of stations and zones.

(F) The modular design of the system components will permit changes in the number of stations and/or zones as Authority requirements change.

13.15 Mechanical (Division 15)

(a) Basic Requirements:

(1) Refer to Appendix 2K [Energy] for more information on calculation and measurement of the energy use target.

(2) The Facility's steam and medical gases will be supplied from the Energy Centre on Lee Avenue. Steam will be provided at a maximum capacity of 13,000 lbs / hour. The Authority will provide capped-off and/or flanged connections for medical gas, steam and condensate lines at the end of the Diagnostic and Treatment Building service tunnel adjacent to the Facility. Project Co will connect to these services while allowing for seismic restraints and system expansion at the building separation. Project Co will also provide isolation valves (where required) at this point of connection. (Project Co will be responsible to construct openings through the existing wall as required to facilitate permanent access, including sealing the construction between new and existing building elements.)

(3) Provide utilities-commission approved meters for domestic water, steam, condensate. Refer to Section 13.15(o) of this Schedule for further information on meter monitoring. Meters will be used to measure energy.

(4) The HVAC, plumbing, fire protection, and medical gases systems will be designed to avoid disruption to the operation of the facility during maintenance or repairs. The systems must be designed so patient rooms do not need to be entered when performing these functions, except:

(A) valves for hot & cold water shutoff and valves for radiant panel supply/return will be located above the ceiling and accessible from the patient washroom;

(B) valves for terminal box reheat coils will be located in the ceiling space above the entryway to the room; and

(C) locations for service access will be located outside of the patient or family zone, and on the opposite side of the privacy curtain from the patient bed.

(5) All isolation, maintenance, balancing, and other service valves located in the corridor ceiling spaces will be accessible from standing or when using a maximum 8-foot tall ladder.

(6) The design should incorporate flexibility for future alterations.

(7) All components of mechanical systems including ductwork, piping, and equipment will be seismically restrained to Post Disaster standards in accordance with BC Building Code and the requirements of Section 5.4(b) of this Schedule.

(8) The HVAC system will be designed to prevent the airborne transmission of viruses, bacteria, fungal spores, and other bio-aerosols.

(9) All systems will be clearly labelled according to the Authority standards. Labelling will include, but not be limited to, painting and labelling of all pipes,

ceiling identification dots, valve tagging, and emergency valve identification signage.

(10) All fixtures and equipment will be designed and installed to manufacturer's specifications and standards.

(11) All fixtures and equipment will be provided by manufacturers with supply and/or service forces located in British Columbia. Replacement and maintenance parts must be stocked locally or readily available.

(12) All work will be performed by qualified tradesmen with valid British Columbia trade qualification certificates.

(b) Technical References:

The following Technical Standards is not intended to be a complete list of all applicable standards. Project Co is responsible for identifying and complying with all Applicable Standards regardless of whether they appear in this document or not.

(1) British Columbia Insulation Contractors Association (BCICA) Quality Standards Manual for Mechanical Insulation, Latest Edition.

(2) ANSI / ASHRAE (American National Standards Institute / American Society of Heating, Refrigeration, and Air-conditioning Engineers)

(A) 52.2-1999 : Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.

(B) 55-2004 : Thermal Environmental Conditions for Human Occupancy

(C) 62.1-2004 : Ventilation for Acceptable Air Quality

(D) 90.1-1999 : Energy Efficient Design for New Buildings.

(E) 111-1988 : Practices for Measurement, Testing, Adjusting, & Balancing of Building HVAC Systems.

(F) 129-1997 : Measuring Air Change Effectiveness.

(G) 135-2004 : Data Communication Protocol for Building Automation & Control Networks

(3) ASHRAE (American Society of Heating, Refrigeration and Air-Conditioning Engineers)

(A) Handbooks: 2003 HVAC Applications, 2004 HVAC Systems and Equipment, 2005 Fundamentals, 2006 Refrigeration

(B) Design of Smoke Control Systems

(C) ASHRAE Guideline 12-2000 - Minimizing the Risk of Legionellosis Associated with Building Water Systems

(4) ANSI / ASME (American National Standards Institute / American Society of Mechanical Engineers)

(A) B31.1 Power Piping Code, for steam systems

(B) Section IX : Welding Qualifications

(C) Unfired Pressure Vessels

(5) ASPE (American Society of Plumbing Engineers)

(A) Plumbing Engineering Design Handbook, Volumes 1-4

(6) ASTM (American Society for Testing and Materials)

(A) B88 : Copper Piping

(7) CGA (Canadian Gas Association)

(A) P-2.1 : Standard for Medical / Surgical Vacuum Systems in Hospitals

(8) CSA (Canadian Standards Association)

(A) B45 Series-94 : Plumbing Fixtures

(B) B64 Series 94 : Backflow Preventers & Vacuum Breakers

(C) B52HB-05 : Mechanical Refrigeration Code.

(D) B125-93 : Plumbing Fittings

(E) B149.1-00 : Natural Gas and Propane Installation Code

(F) B651-95 : Barrier Free Design

(G) Z305.1-92 : Nonflammable Medical Gas Piping Systems

(H) Z317.2-01 : Special Requirements for Heating, Ventilation, and Air Conditioning (HVAC) Systems in Health Care Facilities.

(I) Z317.1-99 : Special Requirements for Plumbing Installations in Health Care Facilities.

(J) Z318.0-93 : Commissioning of Health Care Facilities.

(K) Z318.1-95 : Commissioning of HVAC systems in Health Care Facilities.

(9) NFPA (National Fire Protection Association)

(A) 10-2002 : Standard for Portable Fire Extinguishers

(B) 13-2002 : Standard for Installation of Sprinkler Systems

(C) 14-2003 : Standard for Installation of Standpipe & Hose Systems

(D) 20-2002 : Standard for the Installation of Stationary Pumps for Fire Protection

(E) 50 : Bulk Oxygen Systems

(F) 56F : Non-flammable Medical gas System.

(G) 90A - current edition : Standard for Installation of Air Conditioning and Ventilation Systems

(H) 92A - current edition : Standard for Smoke-Control Systems Utilizing Barriers and Pressure Differences

(I) 96 - current edition : Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations

(J) 101 - current edition : Life Safety Code

(c) Site Services:

(1) All materials will be in accordance with CSA standards.

(2) Provide individual water, fire protection, gas, sanitary, and storm services as required and sized to suit the usage needs of the facility.

(3) Provide two domestic water service connections. The primary service will be supplied from a new service off Richmond Street. The backup service will be supplied from the Diagnostic & Treatment (Diagnostic and Treatment) Building. Connect to the capped-off service from the Diagnostic and Treatment Building as described in Section 13.15(a) of this Schedule.

(d) Building Plumbing Services:

(1) Design Principles:

(A) Domestic water systems will be designed in accordance with CSA Standards. The water systems will ensure delivery of water supplies at the required pressures to all water outlets.

(B) Provide water inlet connections on the exterior of the building for supply water through tanker truck connections. The system will be designed in such a way that it may be used as a backup should the primary services fail during a disaster such as an earthquake.

(C) Natural gas systems will be in designed in accordance with CSA standards.

(D) Provide durable materials to allow for 24 hour a day operation with minimal downtime.

(E) Consideration should be given to easy access and serviceability and avoiding interference with other services.

(F) Provide floor drains on all mechanical and interstitial floors

(2) Products:

(A) Provide backflow preventers on the incoming water service as well as at equipment source connections where required by code.

(B) Provide interceptors as required by Governmental Authority guidelines to intercept oil, grease, dirt, and solids.

(C) Provide domestic water strainer at the incoming service into the building.

(D) If a water booster pump is required, ensure it is designed with demonstrated redundancy and emergency power capability to provide uninterrupted water service and pressure in the event of malfunction, maintenance, or power loss. It must also be able to work in conjunction with a water tanker truck under post-disaster conditions. Refer to Section 5.4(b) of this Schedule.

(3) Execution:

(A) All drainage systems will be designed such that the system connects to the site services. Designs will utilize gravity drainage where possible.

(B) If a pumping system is required for subsurface, storm, or sanitary drainage, then the design will include 100% redundancy with equipment on emergency power such that the system does not flood the mechanical space it is housed in. The sump will have twin compartments: a settling and a pumping compartment, and will be sized to prevent short cycling of the pump. Provide alarm points for high water and pump failure.

(C) Insulate storm drainage, domestic water piping, and exposed p-traps throughout as per BCICA quality standards.

(D) All plumbing drainage in the renal designated IPU, and individually designated renal capable rooms will be ‘acid-waste’ or equivalent to a point such that dilution renders discharge ineffective.

(E) In each renal designated room provide capacity for renal discharge and tempered water in a location adjacent to the patient bed and provide for

automatical and regular flushing of the system. See Sections 13.15 and 13.16 for locations and requirements.

(F) All plumbing drainage in oncology room(s) that may have radiotherapy or chemotherapy materials discharged (sink or toilet) are to have protective containment (i.e. lead lining) to a point of sufficient dilution.

(G) All plumbing drainage in the psychiatric or mental health units will be designed such a way to limit or remove blockage such as clothing from the piping system.

(H) Consideration should be given to reclaiming waste heat from sources such as showers or condensers.

(I) Provide flushing and disinfection of domestic water systems. Provide independent testing of piping systems once flushing and cleaning has been completed.

(J) Provide automatic trap primers in drains that would not necessarily have regular washdowns so as to prevent drains drying out.

(e) Plumbing Fixtures:

(1) Design Principles:

(A) All plumbing fixtures to comply with CSA : B45, B125 and Z317.1_99 or latest, and will be suitable for a hospital inpatient care facility. Fixtures selected must have proven acceptable hospital performance from previous installations.

(B) Barrier-free plumbing fixtures and fittings will comply with CSA B651 will be suitable for a hospital inpatient care facility.

(C) Provide anti-splash fittings that do not retain air in all inpatient care areas.

(D) Fixtures will not have an overflow unless a cleaning program will be in place.

(2) Products:

(A) Public toilets will be elongated and low-consumption. They will have an open front seat with electronic hands-free flush valve operation.

(B) Patient toilets will be elongated and low-consumption. They will have an open front seat with manual flush valve operation.

(C) Urinals will be wall-hung and low-consumption. They will have electronic hands-free flush valve operation.

(D) Public washroom lavatory fixtures will be made of an impervious, durable material. They will have electronic hands-free type faucets with single temperature supply.

(E) Patient washroom lavatory fixtures will be made of an impervious, durable material. They will have electronic hands-free type faucets with single temperature supply.

(F) Staff handwash sinks for nursing stations, patient rooms, examination rooms, and other similar function rooms will be made of stainless steel or suitable material. All such sinks will have electronic hands-free type faucets with single temperature supply and gooseneck spouts, except that sinks in mental health areas of the Facility will have vandal resistant metering faucets instead of gooseneck spouts.

(G) Bathtubs & showers will have slip resistant flooring and pressure compensated thermostatically controlled valves.

(H) Plumbing fixtures in the psychiatric or mental health units will be products that will prevent undue harm or damage to the building and/or occupants.

(I) Toilets should be of a type that can be used with portable bariatric commode chairs if required.

(J) Provide trap primers with automatic solenoid valves at p-traps in negatively-pressurized rooms.

(K) Provide suitable quantities of janitors' sinks, hose bibs, eye wash stations, and drinking fountains to provide sufficient service to the facility.

(3) Execution:

(A) Provide isolation valves for all floors and individual rooms for all plumbing services. Clearly identify all valves according to the Authority standard labelling system

(B) Provide roughed-in plumbing services for future conversion of Mental Health patient rooms to standard Medical-Surgical patient rooms. Make provisions in both systems sizing and installation to minimize demolition required during future conversion.

(C) Provide accessible clean-outs for all sinks and lavatories (and future sinks and lavatories) above the flood-level rim of the sink.

(D) Project Co will construct working mock-ups of all sinks with gooseneck faucets for the Authority's review.

(E) Toilets will be selected with special attention to reducing spread of infection. Flush valves will be suitably sized for the water consumption of the bowl. Toilet bowls will not splash or spray water onto the toilet rim or anywhere outside of the toilet bowl and will be designed to minimize the aerosolization of the toilet contents.

(F) All electronic sensor-activated fixtures are not permitted to be of the disposable battery-operated kind.

(f) Domestic Hot Water Systems:

(1) Design Principles:

(A) Domestic hot water demand will be calculated in accordance with ASPE Plumbing Engineering Design Handbook.

(B) Domestic hot water system will be designed with sufficient capacity and recovery rate for the facility's hot water requirements.

(C) Domestic hot water system will be designed with a circulation system to ensure timely delivery of hot water to all fixtures.

(D) Domestic hot water system will be designed in accordance with ASHRAE Guideline 12-2000, or equivalent design standards, to prevent growth and spread of Legionella bacteria within the tanks, piping, fixtures, or any other component. Design methods to use include, but are not limited to, eliminating dead-leg piping, and minimizing uncirculated piping by connecting the circulation system as close as possible to fixtures.

(2) Execution:

(A) Provide pressure reducing valves with 100% redundancy in accessible locations if system pressure exceeds acceptable delivery pressure.

(B) Provide steam pressure relief safety valves to atmosphere per relevant codes.

(g) Medical Gas Systems:

(1) Design Principles:

(A) The medical gases for the Facility will be supplied from the Authority central supply.

(B) All medical gas systems will be to CSA Z305.1-92 : Nonflammable Medical Gas Piping Systems code, NFPA and CGA.

(C) Medical gases will include Oxygen, Medical Air, and Medical Vacuum.

(2) Products:

(A) All pipe and pipe fittings will be in accordance to ASTM 88.

(B) Service Outlets:

(i) Provide recessed service outlets boxes designed for concealed piping and fabricated for straight insertion of secondary equipment. Outlets will be designed and manufactured in accordance to NFPA, CGA, and CSA standards.

(ii) Each recessed wall outlet will have a permanently marked, colour-coded non-interchangeable index system so to prevent the connection of the wrong gases. Provide a secondary check valve to hold the line pressure if the primary valve is removed for maintenance.

(iii) Provide 2-part DISS type outlet connections for each medical gas.

(C) Ball type shut off valves will be U.L. listed label showing the appropriate gas service & pressure rating. Valves will swing out during installation and have a quarter turn from full open to close.

(D) Area Zone shut off valves will be housed in a single box with multiple shut off valves with tube extensions, lexan glass door with hinges and pull out opening ring. Provide pressure / vacuum gauges for each service.

(3) Execution:

(A) Project Co will install all medical gas piping in the Facility.

(B) Project Co will submit the projected loads of the various medical gases such that the Authority can validate capacity of their existing equipment.

(C) Design the system such that there is one zone shut off system per nursing unit complete with central alarm panel at each zone.

(D) Provide construction shut off valves such that groups of no more than 6 inpatient rooms can be isolated to accommodate renovations without disrupting service to other areas. These valves will be located in an identified accessible location.

(E) All medical gas piping in normally inaccessible areas (eg: behind walls and boarded ceilings) will be marked such that the nature of the gas may be readily determined at any point, e.g. painted along the entire length during installation. Paint colour will be as per the Authority's standards

(F) Locate medical gas terminal panels within each bed's head wall.

(G) Design the system in conformance with CSA Z305.1, such that groups of 18 beds will have its own valve box and alarm panels. Alarm panel will be connected to both building and emergency power.

(H) Provide BMS alarm interface signal to the Authority's central DDC system for critical alarms such as low or high pressure.

(I) The above and any other alarms will also notify Project Co's BMS system and the Authority's Central Services monitoring system.

(J) Provide roughed-in medical gas services, routed and capped in the ceiling space above each mental health patient room, sufficient to accommodate headwall requirements detailed in Section 9.6(b)(1) which allow future conversion of Mental Health patient rooms to Medical-Surgical patient rooms.

(h) Specialty Systems

(1) Design Principles:

(A) Supply and install a water filtration system for the facility's potable drinking water. The system will be cross connected to the existing Diagnostic and Treatment wing potable water system.

(B) Supply and install all specialty systems as required to provide a complete installation. These systems include, but are not limited to:

(i) Acid waste and venting,

(ii) Radioactive waste,

(iii) Oil, grease, dirt, and solids interceptors,

(iv) Food services retherm area ventilation, exhaust, and cooling,

(v) Retail area restaurant kitchen exhaust (note: do not provide ventilation that requires fire suppression, e.g. one designed for deep frying).

(C) Interceptors will be designed to manufacturer's specifications and Capital Regional District standards.

(D) Kitchen exhaust hoods and ductwork, where required, will be designed to NFPA-96 standards.

(2) Products:

(A) Filtration system will be capable of removing bacteria and particulates larger than 25 microns.

(B) Acid waste, vent piping, and fittings will be suitable for the pH levels of the waste system.

(C) Provide trap primers with automatic solenoid valves at all acid waste p-traps.

(3) Execution:

(A) Filtration system must be sized to handle 100% design flow rate with redundant filters piped in parallel to allow for cleaning and repair.

(B) Provide and install cross-connection capability including valves and piping on domestic water service that will allow connection to the Authorities' water supply connection to be located at Grid line Q.

(C) Provide capacity for acid waste drainage suitable for renal services as identified in Appendix 3A

(i) Fire Protection

(1) Design Principles:

(A) Design the building smoke control system in accordance with NFPA standards including (but not limited to) 92A and 101, and as accepted by Governmental Authorities. Coordinate smoke compartment pressurization strategies with other design fields and systems.

(2) Products:

(A) All fire protection equipment will be ULC approved.

(B) Each fire extinguisher will be located per relevant codes and to the satisfaction of the City of Victoria inspection department and approved for the hazard and classification of the space it serves.

(C) The sprinkler system and equipment will be designed to the occupancy classification that it protects.

(D) Quick response sprinklers will be provided throughout.

(E) Provide on the sprinkler system take-off from water supply an approved detector type double check valve assembly with approved listed OS&Y gate valves on both sides complete with tamper switches.

(F) As sprinkler heads in areas subject to damage, such as Mental Health areas, will be of a type that will protect the patients and staff from harm.

(G) The fire pump, if required, will require emergency power supply and will have a transfer switch which is part of the fire pump controller, package mounted in separate mechanically attached enclosure to form one assembly, specifically approved for the purpose as a complete unit. Alternatively, the fire pump can be diesel fired in accordance with NFPA-20.

(3) Execution:

(A) Install fire extinguishers in a semi or fully recessed cabinet to the satisfaction of the City of Victoria Inspection Department.

(B) Fire Department Connection will be installed at a location approved by the local Governmental Authorities.

(C) Locate zone shut-off valves so they are visible and accessible from the floor. Do not conceal from view: do not locate in janitor rooms, storage rooms, or stairwells except as accepted by the Consultant.

(j) Heating

(1) Design Principles:

(A) Space heating capacity must be sufficient to meet the required indoor design temperatures outlined in Appendix 3B [Space Design Comfort and Pressurization Criteria] while using the January 1% outside design temperature outlined in the BC Building Code.

(B) The heating equipment will be sized sufficiently to meet the maximum simultaneous facility demand for all systems served by the heating plant. It also must be capable of controlling and responding to periods of low usage.

(C) Apply energy recovery systems to offset plant heating requirements. Provide analysis of energy savings, life-cycle costing, and maintenance concerns

(2) Products:

(A) Finned tube radiators within the patient rooms are prohibited.

(3) Execution:

(A) Provide radiant heat panels over burn unit beds with in-room temperature control.

(B) Locate steam traps so condensate is drained by gravity as much as possible. Provide condensate pumps where required.

(C) Any ventilation and/or radiant heating sources () serving the patient rooms will be connected to the building's emergency power supply.

(k) Air Conditioning

(1) Design Principles:

(A) Space cooling capacity must be sufficient to meet the required indoor design temperatures outlined in Appendix 3B [Space Design Comfort and Pressurization Criteria] while using the July 2.5% outside design wet and dry bulb temperatures outlined in the BC Building Code.

(B) Project Co will clarify building cooling load requirements such that the Authority can validate capacity of their existing plant.

(C) Utilize 100% outdoor air for free cooling as the first means of space cooling.

(2) Execution:

(A) Ensure no air within the air conditioning system, outside of the central air handling equipment, drops below its dewpoint temperature.

(l) Ventilation

(1) Design Principles:

(A) Design the ventilation system and all components in accordance with ASHRAE Standard 62.1, CSA Z317.2, and the Authority standards.

(B) Project Co will submit an Indoor Air Quality (IAQ) plans to meet the project's IAQ requirements.

(C) Ventilation rates for all spaces will meet the design requirements described in Appendix 3C [Space Class Ratings, Ventilation and Background Noise Requirements]. If a space is not listed, ventilation rates will comply with the applicable standards and codes.

(D) Provide the minimum filtration levels as described in Appendix 3C [Space Class Ratings, Ventilation and Background Noise Requirements].

(E) Spaces will maintain pressurization requirements described in Appendix 3B [Space Design Comfort and Pressurization Criteria].

(F) Isolation rooms may meet the reduced air change and pressurization requirements of typical patient rooms when being used as such. Controls for changing air controls will be clearly marked and lockable.

(G) The ventilation system will be designed in such a manner to isolate a cluster of bedrooms (for example, 18 bedrooms) and/or IPU and/or floors, and convert it to an isolation ward should an internal or external pandemic and/or disaster occur. Refer to Section 5.1 of this Schedule. Project Co will demonstrate how infectious control has been achieved.

(H) All spaces designated as infectious control or isolation will be connected to emergency power for ventilation and pressurization control.

(2) Products:

(A) Regarding Class I, Class II and Class III spaces:

(i) all Class I, Class II and Class III spaces in the Facility will be supplied air from the same air handling system, which system will be designed to Class I standards;

(ii) the exhaust system for Class I spaces (Isolation Rooms) will be separate from the exhaust system for Class II and III spaces;

(iii) protective isolation rooms will have a HEPA filter at the diffuser.

(B) Air-handling systems will be provided with sufficient redundancy to ensure no disruptions in facility operation. Class I spaces will maintain 100% redundancy. Class II and Class III spaces may maintain approximately 75% redundancy.

(C) Air handling equipment will be factory fabricated to ensure the highest construction standard.

(D) Fans will be designed with Variable Frequency Drives (VFD's) for energy savings under part-load conditions.

(E) Provide an indirect heat recovery system on the exhaust air.

(F) Provide HEPA filters at supply air inlets to protective isolation rooms (positively pressurized). .

(G) Provide HEPA and/or UV filters on building exhaust air systems from all Class I spaces, as required by local authorities, to prevent risk of recirculation of the exhausted air to this or any nearby building.

(H) For isolation of clusters of bedrooms (for example, 18 bedrooms), IPUs and/or floors for infection control, provide dampers of sufficient quality to ensure minimal leakage of airflow. Provide airflow sensor at damper to ensure isolation has been achieved.

(I) Provide differential pressure sensors at isolation rooms, clusters of bedrooms (for example, 18 bedrooms), IPUs and/or floors to monitor and to ensure proper pressurization has been achieved as required.

(3) Execution:

(A) The Facility design will incorporate a strategy to install and remove major building equipment such as fans, etc.

(B) Locate fans, common filters (eg: HEPA), and other equipment in the central mechanical rooms where possible. Allow for adequate clearance for service access.

(C) Make allowances in duct sizing and equipment selections to accommodate some flexibility for future changes in spaces. Allow for a future increase in capacity of 25% on branch lines and 10% on Air Handling Unit sizing.

(D) Design the fresh air intakes, cooling coil drain pans, air handling units, duct mounted humidifiers, ductwork, and all other interconnected components to prevent moisture or contaminants from collecting within the system. Provide sufficient access panels to allow for inspection and cleaning.

(E) Fresh air intakes will be located to not entrain contaminants from outdoor sources. All intakes will be located in areas not accessible by the public. Special consideration should be given to avoid the intake of obnoxious odours from the heliport located northeast to the facility. Project Co will demonstrate how this has been achieved.

(F) All supply, return, and exhaust air will be fully ducted to the space being served.

(G) For all spaces, design supply air diffusers to ensure thorough air mixing and complete supply air coverage at acceptable air speeds.

(H) For infection isolation rooms (negatively pressurized), locate supply air diffusers and exhaust air grilles to reduce the exposure of uninfected occupants in the space. Utilize directional and dilution airflow principles: supply air from high-level non-aspirating diffusers located away from the patient bed, and exhaust air from low-level grilles located next to the patient's head.

(I) For protective isolation rooms (positively pressurized), locate supply air diffusers and exhaust air grilles to reduce the exposure of the patient from other occupants in the space. Utilize directional airflow principles: supply air from high-level non-aspirating diffusers located near the

patient bed, and exhaust air from low-level grilles located away from the patient's head.

(m) Sound Attenuation and Vibration Isolation

(1) Design Principles:

(A) Design all mechanical systems to prevent sound and vibration transmission between spaces, and transmission from mechanical equipment to the spaces and maintain sound to levels shown in Appendix 3C [Space Class Ratings, Ventilation and Background Noise Requirements]. Design mechanical systems located at or near the Building exterior to minimize sound transmission to the neighbouring residential community.

(2) Products:

(A) Provide vibration isolation devices on all equipment with rotating components.

(B) All hung equipment will utilize spring isolators designed for the weight and vibration characteristics of the equipment.

(C) Provide flexible connectors on all pump, duct, and wiring connections to isolated equipment.

(3) Execution:

(A) Ensure duct silencers meet or exceed the requirements of the ductwork for cleanliness and inspection.

(n) Controls:

(1) Design Principles:

(A) The controls system will be designed as a Building Management System (BMS), to allow monitoring and operation of the entire building from a single location or remote Internet connection.

(B) The BMS will be a completely integrated (front-end and back-end) Native BacNET DDC system.

(C) The BMS will be capable of expanding in scope and size with future facility renovations.

(D) The BMS will minimize the building's energy usage by optimizing system performance under all operating conditions.

(2) Products:

(A) The BMS will be provided as a complete package from one manufacturer, not a composite system from several manufacturers.

(B) Components of the complete BMS system include, but are not limited to:

(i) Building controllers, field control devices, and sensors,

(ii) Data communication equipment for transmitting building data and alarms to outside devices,

(iii) All conduit, wiring, and coordination of equipment.

(iv) Complete operation and training manuals, including full documentation of all software and hardware

(v) Acceptance tests and technical support during commissioning,

(vi) Training of personnel.

(C) Project Co will provide access to the Authority for immediate alarm notification, and for monitoring of the building's BMS: provide one operator workstation for the Authority Central Services, and remote internet access for minimum three concurrent users. Project Co will be responsible for all hardware and for all software licenses and updates.

(D) Provide airflow sensors at infectious control isolation dampers in ductwork to ensure isolation has been achieved. Provide local audio and visual alarms for these sensors in addition to the BMS alarms.

(E) Provide differential pressure sensors between isolation rooms and anterooms, and between anterooms and corridors, or between patient rooms and corridors to monitor space pressurization. Provide local audio and visual alarms for these systems in addition to the BMS alarms. Local audio and visual alarm to be located at room entrance and at IPU reception desk.

(3) Execution:

(A) Zoning for HVAC systems will be based on occupancy, room location within the building, room orientation, and thermostatic room loads.

(B) Failsafe components will be hard-wired to provide reliable operation in all circumstances.

(C) The BMS will meter and trend all data related to the flow of services into and out of the building including, but not limited to, domestic water, chilled supply and return, steam, condensate, various medical gas lines, natural gas, and electricity.

(D) The BMS will monitor, control, indicate alarms, and provide trending where applicable for all connected sensors and control points.

(E) The BMS will be connected to emergency power.

(F) All control signals sent to the Authority for operation of services provided by Central Services will be compatible with the existing controls system of Central Services.

(G) The BMS will indicate critical alarms for essential building and life safety systems. These alarms will notify the Authority as well as the building's master control centre. These critical alarms include, but are not limited to:

(i) Hardwired system safety failures,

(ii) All temperature alarms resulting from setpoint deviations described in Appendix 3B [Space Design Comfort and Pressurization Criteria] and Appendix 3C [Space Class Ratings, Ventilation and Background Noise Requirements] for Class I and Class II spaces,

(iii) Medical gas system high and low pressure alarms,

(iv) All alarms relating to the fire protection system.

(H) The BMS documentation will include a detailed narrative description of the sequence of operation of each system including, but not limited to, the following items:

(i) Ramping periods and reset schedules,

(ii) Control Description Logic for each system,

(iii) Input/Output summary tables for each system,

(iv) System diagrams.

(o) Testing, Adjusting, Balancing and Commissioning:

(1) Project Co will:

(A) demonstrate to the Authority that the mechanical and electrical systems are substantially operational by testing, adjusting, balancing, and commissioning the systems in accordance with Good Industry Practice;

(B) retain complete records of all TAB and commissioning data; and

(C) perform follow-up TAB services during each season over the first year of the building's operation.

13.16 Electrical (Division 16)

(a) Basic Requirements

(1) All electrical systems, materials, and equipment in the Facility will be of a type and quality intended for use in a permanent health care facility. The electrical systems will provide redundancy, proper protection, continuity of service and a safe working environment for patients, visitors, and staff.

(2) All systems and equipment required for the work of each identified program will be provided and will be configured with due regard for the details of delivery of the programs.

(3) Understand and incorporate into the design and construction the principal that change will be a constant and inevitable fact within the Facility. All systems will be constructed so as to facilitate this change while minimizing the cost of change and the amount of interruption to the regular activities of the Facility.

(4) Systems and equipment will be designed and installed in a coordinated fashion. Systems will work together where advantageous, take advantage of current best available technology and through synergy provide the Facility with reliable electrical systems performance directed to facilitating the various functions of the Facility, now and into the future.

(b) Quality Requirements

(1) All electrical systems, including but not limited to life safety systems, lighting, control systems, power service and distribution, and grounding will comply in all respects with the Canadian Electrical Code (CEC) latest version and with all other standards governing electrical work in general, and work in hospitals, cancer facilities and health care facilities specifically.

(2) Provision and installation of electrical systems and equipment will also comply with Standard CAN/CSA-C22.2 No.0-M91 (R1997) and CAN/CSA C22.2 Standards specifically identified in Appendix A of Standard C22.1-02 for Health Care Products.

(3) Configuration and installation will comply in all respects to CSA Standards, including but not limited to CSA Z32.04 Electrical Safety and Essential Electrical Systems in Health Care Facilities.

(c) Performance Requirements

(1) Every electrical system will be installed in a fixed and permanent manner, adequately seismically restrained to meet the Facility needs including the areas

identified as post-disaster. The installation will economically occupy available space, leaving space for future additions, and will be planned to facilitate easy access to other systems and equipment, including but not limited to mechanical equipment, building systems access ways, and architectural building components which may require periodic inspection or activities.

(2) Redundancy will be incorporated into systems and equipment such that the failure of a single piece of major equipment or major conductor will not impair the operation of the Facility nor the clinical or administrative activities.

(3) The protection, grounding and/or isolation, insulation and control of all circuits and systems will be designed and constructed specifically to address the clinical and functional requirements of the locations where they are installed.

(4) The Facility's electrical systems will be designed to maximise worker safety and to minimise the impact to on-going maintenance according to an ARC-Flash Hazard Analysis, specifically Shock Hazard Analysis and Flash Hazard Analysis. The complete system to be labelled for ARC Flash Safety Awareness per NFPA-70E and CSA-Z462 (latest revision).

(5) All electrical Equipment to be color-coded consistent with other buildings on the Campus such as the Diagnostic and Treatment Centre.

(6) The connection of the Facilities high voltage electrical services from the Authorities Energy Centre is to be based on an indicative design that details three service types: Vital, Delayed-Vital, and Normal. The fourth electrical service type, Conditional power, as required per CSA-Z32-04 will be created in the Facility via automatic transfer switch interconnection of Delayed-Vital and Normal distributions connecting to the Conditional distribution. Refer to indicative single-line document titled – Indicative SLD HV Electrical_ES to Facility_Ver1.2 – located in the Data Room.

(7) Ensure that design criteria such as CSA Z32 compliance, transformer redundancy, future capacity, and interlocks with the Energy Centre closed transition ("bumpless") Automatic Transfer Switch (ATS) are detailed and provided.

(8) The ‘Normal’ electrical service will connect all electrical loads that are not to be connected to the essential electrical service types per Z32-04.

(9) Finish all cabinets, panelboards, switchboards, equipment cabinets, cable trays, etc. in ANSI 61 grey enamel unless otherwise specified.

(d) Quality Requirements

(1) Comply with all requirements of a “Post-Disaster” Building as per CSA-Z32, latest revision.

(e) Products

(1) All products provided will be CSA approved and new.

(2) Apply primer on all items which are to be finished on site.

(f) Wiring Methods and Materials

(1) Products

(A) Raceways

(i) Galvanized rigid metal conduit: Standard weight, will be used in wet locations, outdoor runs or in concrete slabs in contact with the earth.

(ii) Galvanized metallic tubing (EMT): Will be used in masonry, partitions, ceiling spaces and exposed indoor runs.

(iii) PVC conduit: Will be rigid PVC scepter for underground electrical distribution and panel feeders and branch circuits below slab.

(iv) All conduits leaving cable tray or other are to be bonded to cable tray.

(B) Wire and Cables

(i) Wire and cables will be new and marked in accordance with code requirements for type, voltage, manufacture, etc. All wiring will be copper unless otherwise noted.

(ii) Wiring will be min. #12 AWG copper unless otherwise noted.

(iii) Conductors larger than #6 AWG may be aluminum.

(iv) Conductors sized #10 AWG and smaller will be of soft copper. Cables will be rated 600 Volt, 90 deg. C. unless otherwise noted. Conductors will be 90 deg. rated type RW 90 XLPE.

(v) Wiring smaller than #14 AWG, solid or stranded: Will not be used except for extra low voltage wiring specified to be executed under this Division. Conductors of #8 AWG and larger will be stranded soft copper.

(vi) Non-metallic Type Cables: Will be multiconductor with PVC outer jacket and rated 300 volt. Conductors will be as specified above.

(vii) Electrical conductors to meet the "VIHA – South Island Electrical Specifications for Acute Care Facilities".

(viii) Vibration Isolation: Will be Flexible “Sealtite” metallic conduits, with “Kellems” grips between the conduit and terminal box. (For motor connections).

(C) Wiring Devices

(i) Lighting Switches: Will be of the AC quiet type, hospital grade with totally enclosed framed toggle.

(ii) Receptacles: Will be hospital grade, duplex, 3 wire U ground, “finder face” type, with screw type terminals, double wiping spring bronze contacts, colour as per the Authority Electrical standard.

(iii) Cover plates: Will be nylon as per the Authority Electrical standards.

(iv) Wiring Devices and Cover Plates: Will be by one manufacturer, Bryant, G.E., Hubbell, Leviton or P & S.

(D) Junction and Pull Boxes

(i) Junction and Pull Boxes: Will be of code gauge galvanized or painted steel with screw on metal cover. They will be sized to accommodate conduit of sizes specified and to facilitate pulling in the size and type of cable required.

(ii) Junction, pull and outlet boxes to be identified as per the Authority’s standards.

(E) Hangers and Supports

(i) Support outlet boxes, junction boxes, conduit and all electrical equipment independently with hangers and fastenings to building structural members. Perforated strapping or perforated pipe hangers will not be used.

(ii) Concrete inserts will be cast during pouring, otherwise drilled metal inserts will be installed.

(iii) Hangers in general will be supported from inserts in concrete construction or from building structure using beam clamps for steel structures. Provide all additional angle or channel steel members required between beams for support of conduits, cables, luminaires, etc.

(iv) Use coach screws, lag screws or wood screws as appropriate in any wood construction.

(v) Feeders, conduits and power ducts running vertically in a building will be supported at each floor and between each floor if necessary

(2) Finishes and Painting

(A) All factory supplied equipment will have finish coating factory applied whether finish be painted, galvanized or other, as required and as specified. “Touch Up” scratched or damaged factory finishes to Authority’s approval. Leave bare metal surfaces ready for painting by removing dirt, rust, grease or millscale to Authority’s approval.

(3) Execution

Install wiring for 347/600 volt and 120/208 volt distribution systems as follows: Wire in conduit for feeders.

(A) Wire in conduit for branch circuit wiring from panels.

(B) All wiring will be concealed in finished areas, and identified as per VIHA – South Island Electrical Specifications for Acute Care Facilities Where wire size is not indicated, capacity must match or exceed rating of protective device.

(C) Provide a separate neutral conductor per circuit.

(D) Voltage drop to comply with Z32-04 and CEC Sec 8.

(E) Panels are specified as sequence bussed. All circuits will be balanced.

(F) Feeders, sub-feeders, circuit wiring and ancillary items will be colour coded for phase identification. Neutral conductors will be full capacity with white covering and be continuous throughout the system without fuses, switches or breakers of any kind.

(G) Install wiring continuously within raceways, splices will be permitted only at outlets and junction boxes.

(H) Any exposed conduits or cables will be run parallel to or at right angles to building lines and in a neat manner. Conduits will be thoroughly reamed and each threaded termination will be provided with two lock nuts. Running threads for rigid conduit will not be accepted.

(I) Install underground PVC conduit in accordance with manufacturer’s recommendations. Care will be taken to ensure that there are no sharp bends or kinks in the conduit and that conduit is adequately supported.

(J) Internal raceways in the building:

(i) Securely cap or plug all openings in conduit and ducts during the execution of the Work to prevent obstruction entering the openings.

(ii) At completion of the installation, the service entry ducts and the conduit system in the building will be fished to clear all blocks.

(iii) Outlet and pull boxes will be cleaned out and the system left free from water and moisture.

(iv) Provide all conduit, wire, fittings, disconnect switches, line voltage, controls and auxiliary materials as previously defined to wire into service all 3 phase motors, single phase motors and equipment included in other Sections unless specified otherwise.

(v) Branch circuits to have dedicated neutrals per, to meet equipotential grounding and testing requirements. Refer to CSAZ32-04 and "VIHA – South Island Electrical Specifications for Acute Care Facilities" for guidance.

(vi) Install local lighting switches on the strike side of the door unless shown otherwise.

(vii) Install weatherproof receptacles flush with wall face.

(viii) Outlet boxes in walls and partitions will not be mounted back-to-back; separate them by 6” minimum.

(ix) Mount single gang receptacles and switch boxes with their greatest dimension in the vertical direction.

(x) Install pull boxes in the locations as required by the Canadian Electrical Code. Boxes will be located in inconspicuous spaces.

(xi) Install pull boxes in conduit runs where required to facilitate the pulling in of cable, and locate in inconspicuous accessible spaces.

(xii) Mount disconnect switches adjacent to or attached to motor or equipment it serves.

(xiii) Motor starters will be located in accessible areas; mechanical rooms or maintenance areas. Provide necessary control wiring and interlocks between units as detailed on the plans. Check that overload devices are rated or set at a maximum value in accordance with table D12 of the Canadian Electrical Code. Replace or adjust devices where necessary. Coordinate with Division 15 for exact locations and requirements.

(xiv) Provide flexible connections to mechanical equipment for vibration isolation. Connections to equipment roof mounted or in other damp or wet locations will be liquid tight.

(xv) Conduit will not be run through beams.

(xvi) In those instances where conduits must pass through concrete beams, they will be cast in place. Coordinate with structural engineer prior to rough-in.

(xvii) Joints of conduits underground will be watertight.

(xviii) Conduit installed in a slab on grade will not penetrate the waterproofing membrane and/or vapour barrier.

(xix) Unless absolutely necessary conduits will not be installed through expansion joints. Where it is necessary to install conduits through expansion joints, a pre-manufactured expansion type conduit fitting will be used.

(xx) Provide spare and future conduits. Provide in each of these conduits a nylon fish wire. In addition on the end of each conduit for spare or future provide a stamped metal tag indicating intended purpose, or mark conduit per "VIHA – South Island Electrical Specifications for Acute Care Facilities".

(xxi) Cap conduits left underground for future extension and mark the location of the capped ends clearly on as-installed drawings.

(xxii) To help maintain fire rating, conduits to floor mounted receptacles or other floor mounted outlets will be run in floor slabs where possible i.e. conduit penetrations from ceiling spaces below up through floor slabs will be minimized.

(xxiii) Where wiring is required to penetrate floor slabs, e.g. to free standing millwork items, the floor penetration will be made using a 4-hour rated poke-through device.

(xxiv) When conduit runs from refrigerated spaces to non- refrigerated spaces, or between refrigerated spaces of different temperatures, provide type EYS or EZS conduit seals as manufactured by Crouse-Hinds or approved equal, unless detailed otherwise.

(xxv) All conduits and wiring penetrating floor slabs or fire walls will be sealed with CSA approved flame retardant compounds, to maintain adequate fire ratings.

(xxvi) Labelling to meet the directives of the BC Safety Authority detailing “Approved Certification Marks for Electrical Products”.

(g) Service & Distribution

(1) General

(A) Building Electrical Distribution ‘Buss’ requirements

(i) Delayed Vital (Supplied AT 12.5Kv by the Authority)

(ii) Vital (Supplied AT 12.5Kv by the Authority)

(iii) Normal (Supplied AT 25Kv by the Authority)

Note: Conditional to be created via automatic transfer switch within Facility – see indicative document titled - Indicative SLD HV Electrical_ES to Facility_Ver1.2 – located in the Data Room.

(B) Work Included

(i) Supply and install appropriately sized tray to grid line Q and connect to Authority installed tray. Design, supply, install, and commission electrical service conductors for each High Voltage service (Norm, DV, V) to the Authority Energy Centre located at Lee Avenue. Routing within existing Facility will be dictated by location of Authority provided conduits and cable trays. Project Co will be responsible for load calculations and protective fuse coordination study. Project Co will supply report to Authority for correct equipment ordering and installation. Authority will supply High Voltage Switchgear, associated protection, and transfer switches. Project Co will be responsible for commissioning of the Facility HV system including Authority supplied HV switchgear in the Energy Centre.

(ii) Project Co will design, supply, and install remote, matching ATS coordination, protection, and signalling devices in Facility HV Switchgear. Project Co will be responsible to ensure signal to Authority ATS is designed, supplied and installed to the Energy Centre ATS. Project Co will coordinate with Authority for commissioning of this system.

(iii) Provide drip shields for sprinkler-proofing on all surface mounted distribution equipment. For high-voltage unit-sub, provide proper angled ventilation provisions.

(iv) Provide coordination study to confirm primary breaker relay settings to coordinate with Authority Energy Centre upstream protection and with downstream distribution equipment.

(C) Products

(i) Unit Substation

(ii) High Voltage Switchgear

(iii) The high voltage (12.5KV or 25 KV) (dependant on service type) switchgear will contain gang operated visible blades, external handle operated switch.

(iv) Primary voltage is 12,500 volt & 25,000 volt (dependant on service type) - Secondary to be determined by Project Co.

(v) The transformer will be rated as Class H ventilated dry-type ANN, with a delta primary and a wye-connected secondary complete with 4-2.5% taps, 2-FCAN and 2-FCBN.

(vi) Provide winding temperature sensor and indicating thermometer.

(vii) Lightning Arrestors

(vii).1 Provide lightning surge arrestors designed to protect the distribution transformer.

(viii) Enclosure

(viii).1 The enclosure will be designed for indoor installation.

(viii).2 Provide ground bus.

(ix) Provide required signage on the appropriate cubicles of the unit substation and on the doors to the main electrical room.

(ix).1 Provide all ARC – Flash risk calculations signage and Personal Protective Equipment per NFPA 70E and CSA Z462 or latest.

(ix).2 Key Interlocks

(ix).2.1 *Provide key interlocking.

(ix).2.2 *Provide lamicoid nameplate outlining the procedure involved for both key interlocks.

(ix).3 Acceptable Manufacturers

(ix).3.1 *Equipment will be as manufactured by Cutler-Hammer, Schneider, Siemens or Weismer Rawlings.

(x) Main Distribution Centre

(x).1 Main distribution centre will be rated as required.

(x).2 Provide ground fault relay and shunt trip for main breaker.

(x).3 Provide tie breakers between each service type (Normal-DV (through automatic transfer switch), Normal-V, and DV-V) for circuit isolation and maintenance. See document titled – Indicative SLD HV Electrical_ES to Facility_Ver1.2 – for indicative design and intent.

(xi) Distribution Centres

(xi).1 Distribution centres will be, rated as required.

(xi).2 Fusible distribution centres will be, rated as required.

(xii) Panelboards

(xii).1 Power and lighting panelboards will be of the circuit breaker type. Electrical characteristics, main sizes, quantities of breakers and quantity of branch circuits will be as indicated on the drawings. Ensure that double-tub panels are factory approved for the application.

(xii).2 All panels are to be sized with 10% spare load and breaker capacity.

(xii).3 Doors will be supplied with concealed hinges, chromed locks and hardware. All locks will be keyed alike. Doors will be fitted with plastic covered panel directory, with circuits and areas served typed in.

(xii).4 Branch Breakers: Will be of the bolt-on type. They will be thermal magnetic type with toggle mechanism, and be designed for use as switches. Two and three pole breakers will be common trip type with single handle. Handle ties will not be permitted.

(xii).5 Ground fault circuit interrupters where required will be C.S.A. Class A with 5mA tripping level and will have push-to-test button on front.

(xiii) Distribution Transformers

(xiii).1 Distribution transformers will be dry, open ventilated type, 150C maximum temperature rise.

(xiii).2 Transformers will have 4 - 2.5% taps, 2 - FCAN and 2 - FCBN.

(xiii).3 Transformers will be as manufactured by Federal Pioneer, Polygon, Hammond, Acme, Delta, Rex or approved equal.

(xiii).4 T-connected transformers may not be substituted where delta-Y connected transformers are specified.

(xiv) Capacitors

(xiv).1 Capacitors will be dry self-healing type complete with monitoring indicating.

(xiv).2 Provide sufficient capacitors to maintain minimum 95% power factor correction.

(xv) Motor Control Centres

(xv).1 Motor control centre will be arranged and rated as required.

(xvi) Power Conditioning Filters

(xvi).1 Service entrance and Distribution centre power conditioning filters will be, surface mounted, incorporating transient voltage surge suppression and UL1283 listed active tracking filter. Filter will have minimum repeated surge current withstand capacity of 175,000 A per phase and maximum UL1449 suppression ratings of 400 L-N, 400 L-G and 400 N-G.

(xvi).2 Branch panel power conditioning filter(s) will be, incorporating transient voltage surge suppression and UL1283 listed active tracking filter. Filter will have minimum repeated surge withstand capacity of 100,000 A per phase and maximum UL1449 suppression ratings of 400 L-N, 400 L-G.

(xvii) Cable Tray

(xvii).1 Cable tray will be aluminum, wire mesh, or steal ladder type.

(xviii) Revenue Meters

Provide revenue quality meters to be installed on electrical services being provided to the Inpatient Facility. Information to be shared electronically with the Building Automation System (BAS).

(xix) Execution

(xix).1 Major electrical equipment, which includes but is not limited to transformers, main distribution centres, transfer switches, motor control centres, and power factor correction equipment will be grouped together in a configuration that allows for addition or expansion of each type of equipment, logical arrangement in terms of the interconnection, operation and maintenance of the equipment.

(xix).2 Major electrical equipment will be located with the intention of minimising run length of feeders and branch circuits, and will be located so as to provide a

clean, dry, safe, accessible installation protected from unauthorised access.

(xix).3 All components of transmission and distribution systems will be selected configured, located, and installed so as to avoid the transmission of noise, vibration or unwanted heat into other parts of the Facility.

(xix).4 Protection, and coordination of protection equipment will be designed and installed so that the initial electrical installation, and future additions and modifications to the installation will be properly protected and fully coordinated, meaning that in the event of a fault or overload, protective devices will act to isolate only the faulty portion of the system, leaving all other portions of the system fully operational. Protection equipment will adequately protect against injury to persons and damage to property. The secondary main switchgear will consist of breakers not fuses. Provide proper interrupting rating on breakers as needed per the design.

(xix).5 Where required by system characteristics or operational requirements, special shielding, isolation, grounding, bonding, harmonic filtration or other treatment will be provided to prevent interference between systems or degradation of performance of an individual system.

(xix).6 Single phase 120VAC grounding receptacles conforming to CEC and Specifically to CSA Configuration 5-15R are to be provided at each location where electrical equipment requiring a supply of normal or emergency power will be plug connected, including provision for portable maintenance and cleaning equipment. In general receptacles will be provided to meet or exceed the following minimums.

(xx) Receptacles are to be installed to meet the requirements of CSAZ32-04 or latest, the current CEC, the number of devices to be installed per equipment requirements and the following table:

Receptacles Requirements

In one-person offices	See Section 13.16(g)(1)(C)(xx) above.
In multiple person offices	See Section 13.16(g)(1)(C)(xx) above.
In meeting rooms - NOTE: ensure accommodation of Post Disaster Equipment Requirements (Delayed – Vital)	One (1) duplex receptacle for each 3 meters of linear wall and a minimum of one (1) duplex receptacle over each counter

In Patient Care Areas	As per CSA Z32 – 04 and see Section 13.16(g)(1)(C)(xx) above.
In Service rooms, housekeeping closets, small store rooms	See Section 13.16(g)(1)(C)(xx) above (minimum one duplex receptacle)
In all other areas, hallways, common areas.	See Section 13.16(g)(1)(C)(xx) above.
In all other areas	See Section 13.16(g)(1)(C)(xx) above.
Nurse Stations, special areas, maintenance areas etc.	Devices to be installed as per Section 13.16(g)(1)(C)(xx) above plus 25 percent.

Receptacles in patient care areas will be hospital grade. Receptacles in all other areas will be specification grade. Residential grade receptacles will not be permitted. All receptacles will have cover plates. Receptacles will be labelled as per "VIHA – South Island Electrical Specifications for Acute Care Facilities".

(h) Power Quality

(1) Overriding Principles

(A) An overall power quality which assures suitable conditions for operation of all electrical and electronic equipment throughout Facility will be established and maintained.

(B) Equipment and systems which assure that electrical equipment and systems will not be harmed or impaired either by external events or conditions, such as lighting and disturbances on the utility service, or by internal events or conditions generated within the Facility by characteristics of systems and equipment are to be provided.

(2) Quality Requirements

(A) Power quality will meet or exceed the IEEE established standards for power quality, including but not limited to Harmonic Mitigated transformers provided where deemed necessary by Project Co and the following:

(i) IEEE Standard 519 - Harmonics

(ii) IEEE Standard 1250 - Voltage Quality

(iii) IEEE Standard 1346 - Recommended Practice for Evaluation electric Power System Compatibility with Electronic Process Equipment

(B) Methods and equipment consistent with IEEE Standard 1159. All other system testing will be done by a technician using portable test

equipment. Filters, TVSS, etc will be provided as required. Power quality meters will be provided at all secondary distribution centres. Project Co to provide transient suppression to panels as required, used to prove that power quality meets or exceeds published standards.

(3) Performance Requirements

(A) The facilities are to include equipment specifically designed to control and remove all adverse power quality conditions that could damage or impair function of any of the electrical or electronic equipment, which will be in use in the Facility.

(i) Lighting and Controls

(1) General

(A) Applicable Standards

(i) Comply with CSAZ 317.5 illumination systems in Health Care Facility.

(B) Work Included

(i) Provide luminaires, supports and wiring to make operational the lighting system.

(C) Products

(i) Lamps

(i).1 Incandescent lamps are not to be used in this facility.
(i).2 High intensity discharge lamps will have shock and vibration resistant tube supports.

(ii) Ballasts

(ii).1 Fluorescent ballasts will be electronic.
(ii).2 High intensity discharge ballasts will have minimum power factor of 90%.

(iii) Acrylic Lighting Diffusers

(iii).1 Acrylic lighting diffusers will be ULC listed and as such manufactured by Holophane, KSH or equal.
(iii).2 Diffusers to be suitable for cleaning and comply with Infection control measures.

(j) Electric Heat and Controls

(1) General

(A) Related Documents

(i) Work Included

(i).1 The use of electric heat is to be avoided and used only in minimal quantities.

(i).2 Supply and install control of electric heaters as required.

(i).3 Coordinate requirements of control (BAS) integration with Div 15.

(i).4 Provide a minimum of a CAT 5e cable to every mechanical control point, including thermostats, VSD's, etc.

(k) Mechanical Equipment Connections

(1) General

(A) Provide a complete system of wiring to motors and 120 volt controls.

(B) Products

(i) Motor Disconnect Switches and Starters

(i).1 208 and 600 volt 3 phase disconnect switches will have quick-make, quick-break visible blade mechanism, cover interlocks and padlocking switch in the closed or open position.

(i).2 Provide EEMAC 1 enclosures indoors and EEMAC 3R enclosures outdoors.

(l) Miscellaneous Equipment Connections

(1) General

(A) Provide a complete system of wiring and connections to all equipment.

(B) Execution

(i) Service to Elevators

Take service from the delayed-vital emergency power supply.

In the elevator pits, supply and install lighting, receptacle and switch, in accordance with the requirements of the supplier.

The installation is to be in accordance with the requirements of the Department of Labour, Elevator Inspection Branch and Section 38 of the Canadian Electrical Code.

Feeders to elevators are to be fire rated.

(m) Seismic Requirements for Electrical Systems

(1) Overriding Principles

(A) Seismic restraint for all electrical equipment and components of electrical systems which is part of the building electrical systems in all parts of the facility will be seismically restrained to post disaster standards to prevent injury or hazard to persons and equipment and to retain equipment in a safe position in the event of a seismic disaster.

(B) Seismic restraint systems and methods will be selected to facilitate ease of maintenance and ease of replacement and reconfiguration of electrical equipment and systems and other equipment and building components.

(C) Seismic restraint systems and methods will be selected to coordinate with the building Architecture and finishes. Components of seismic restraints will, wherever practicable, be concealed from public view. Where concealment is not practicable the systems will be designed to complement building Architecture and finishes.

(2) Quality Requirements

(A) Seismic restraints will meet or exceed the requirements of the current edition of the BC Building Code. Where the Code identifies specific requirements for Health Care facilities and/or Post Disaster areas within this building, those requirements will be met or exceeded.

(B) Seismic restraint design will follow the recommended practices published in the Seismic Restrain Standards Manual (AIBC) as adopted by the Electrical Contractors Association of BC.

(C) Seismic restraint design will follow CSA 5832-01 Guidelines for Seismic Risk Reduction of Operational and Functional Components.

(3) Performance Requirements

(A) All electrical equipment and components of electrical systems that have the potential to cause injury or damage during or following a seismic event will be seismically restrained.

14. COMMUNICATIONS SYSTEMS (DIVISION 17)

14.1 Basic Requirements

(a) Communication Systems

"**Communications Systems**" means, collectively the clock, fire alarm, wireless communications, nurse call, public address, video conferencing, patient monitoring,

central dictation , equipment tracking, patient tracking, staff duress, card access and security systems required by this Agreement to be included in the Facility.

(b) Responsibility Matrix

Attached as Appendix 3D is the "Communication Systems Responsibility Matrix" setting out and describing the allocation of responsibilities between the Authority and Project Co for the various Communication Systems, and the related components and infrastructure, during the Construction Period and the Operating Period.

(c) Quality Requirements

The Communications Systems technology will be when installed the latest proven technology supplied by leading manufacturers in the industry.

Project will comply with all applicable CSA Standards including but not limited to CSA C22.2, CSA Z32-04.

All equipment and materials will be certified by CSA or ULC or other testing agency approved and accepted by the BC Safety Authority and local authorities having jurisdiction, and will bear the seal of the agency in clearly visible locations.

All applicable IEEE, CSA, ULC, TIA / EIA, and BICSI standards will be complied with.

(d) Performance Requirements

The Communications Systems will integrate with the Authority's existing systems at the RJH site and, as practical, future new systems in the Facility and with the technology at the Authority's other healthcare locations so as to allow seamless communications between the Facility and the other facilities. The systems to be integrated include but are not necessary limited to video conferencing, telephones, all networks, patient entertainment, patient education, access control, CCTV, clock, staff duress, intrusion detection, and specialized clinical equipment such as picture archiving and communication systems (PACS), clinical systems, electronic registration, and dictation systems.

The Facility's electronic systems are to allow for the transmission, storage, and retrieval of the electronic health record within the Facility and from/to the Authority's other facilities.

(See Section 6.19 of Schedule 2 [Design and Construction Protocols] regarding training for use and maintenance of equipment including Communications Systems.)

Communications Systems are not to be dependent on the LAN for on-going operation.

14.2 Clock System

(a) Performance Requirements

(1) Project Co will provide a clock system throughout the Facility;

(2) The clock system will provide quick time identification throughout all areas of the Facility.

(3) A Primex GPS wireless clock system c/w 5w antennae is newly installed on site and will be capable of providing a sufficient signal throughout the Facility.

(4) Products will be equivalent to Primex 5w transmitter; digital face clocks.

(5) The Clock System is classified as equipment Category 3a

(6) Clocks will be 120 Voltage.

14.3 Fire Alarm

(a) Quality Requirements

The fire alarm system will be designed and installed to meet the following standards:

(1) Can / ULC S524 Standard for Installation of Fire Alarm Systems

(2) Can / ULC S537 Standard for Verification of Fire Alarm Systems

(3) Elevator Code CAN3-B44.

(b) Performance Requirements

(1) System

(A) The fire alarm system will provide an early warning system in the event of a fire that will communicate the location of the fire.

(B) The fire alarm system will be one part of Project Co's overall fire plan. A sprinkler system, policy and procedures, staff education, and the city and fire department liaison will complement the system in protecting staff and public in case of fire.

(C) The fire alarm system will annunciate on the wireless telephone system and on the building management system notifying staff selected by the Authority of the alarm event.

(D) The fire alarm system will integrate with the nurse call system for annunciation of alarms.

(E) The fire alarm system must fully integrate with the existing Edwards EST-3 Fire Alarm Panel in the Diagnostic and Treatment System to integrate the two systems, including any upgrades on programming.

(F) Provide a fully addressable, two stage, computer based fire alarm system throughout the new Facility.

(G) The fire command centre will include the main panel, a personal computer with the latest monitoring software and control of all required elevators, mechanical systems and fire fighter phones.

(H) Smoke and heat detectors will be individually field programmable and include multiple elements for earliest detection, individually adjustable for ambient environmental conditions.

(I) The sprinkler systems will connect to the fire alarm system and provide full annunciation of all alarms and trouble conditions.

(J) Audible annunciation will be via a zoned overhead paging system that may also act as the public address system in emergency, will be accessible via microphone at the command centre and from any facility phone via a telephone interface. Audible alert levels will be 10dBA above ambient with minimum of 75dBA.

(K) See Section 6.19 of Schedule 2 [Design and Construction Protocols] regarding training.

(L) Visual annunciation will be via building graphic annunciators, a computer workstation, room annunciators provided at all Care (nursing) station (excluding care substations) and main control reception areas.

(M) All alarms, trouble signals and other information will be annunciated at the Facility management call centre location to allow Project Co the ability to manage the system from their main alarm monitoring centre.

(N) Annunciation will occur at the Authority's central monitoring centre located in the Parking Garage.

(O) The system will include pre-programmed voice messaging to automatically audibly annunciate the location of the alarm. All devices to be programmed into the message system.

(2) Equipment

(A) The control panel will be complete with power supply, system supervisory circuit, alarm initiating circuit(s) and alarm indicating circuit(s) as indicated, trouble circuit and auxiliary alarm and trouble relays.

(B) The control panel will be provided with facilities for:

(i) Panel mounted "power on" light.

(ii) A panel mounted, key operated alarm reset switch to silence bells immediately on operation.

(iii) A remote trouble signal.

(iv) An audible trouble signal at the panel, a remote trouble signal with a trouble silencing switch, and a trouble signal silenced light at the panel.

(v) An amber trouble light and supervised red alarm light for each zone.

(vi) Lamp test switches.

(vii) Gelled electrolyte battery pack.

(viii) A low battery voltage detector.

(ix) A key operated alarm bell disconnect switch for test purposes.

(x) Note: Audible trouble signal will sound when alarm bell disconnect switch is in operation.

(xi) Audible and visual indication in event of standby power failure.

(xii) Two N.O. contacts for connection to the supervisory agency.

(xiii) Switches to operate the required smoke control fans.

(xiv) Switches to operate the required smoke dampers.

(xv) Zone switches to allow voice paging over selected zone or all zones. Note the bell sound is to be silenced in the zones which are being paged.

(xvi) Indicating lights and switches for use with fireman's phone handsets.

(xvii) Sending simulated bell sounds over the speakers.

(xviii) Flush mounted wall speakers located in finished public areas.

(xix) A module that will transmit alarm signals including device level address information to remote alarm monitoring provider, signal to be sent via LAN, backup of alarm signal and trouble to be via connected dialer and telephone line.

(xx) Surface mounted wall speakers located in service areas and stairwells.

(xxi) Pull stations will be two stages and c/w general alarm key-switch, commons key.

(xxii) Strobes at all exits, entrances, corridors, stairs to applicable code.

(xxiii) Fire fighters telephones will be installed in a wall box with breakglass door and red ULC supervised handset complying with applicable code.

(xxiv) Amplifiers for paging and simulating the bell sound will be ULC listed for use in fire alarm systems.

(C) Wiring

(i) Wiring will be run in conduit and will be colour coded and identified at each connection point.

(ii) Wiring identification consistent with practices on other parts of the Campus.

(iii) Wiring sizes will be in accordance with manufacturers recommendations.

(3) Testing

(A) On completion of the system and when all of the conditions have been complied with, Project Co will require the manufacturer to undertake a complete inspection and issue:

(i) a copy of the inspecting technician's report showing location of each device and certifying the test results of each device; and

(ii) a Certificate of Verification confirming that the inspection has been completed and showing the conditions upon which such inspection and Certification have been rendered. The Certificate of Verification will include statements to certify:

(ii).1 That the wiring connections to all equipment components show that the installer undertook to have observed ULC and CSA requirements.

(ii).2 That the manufacturers' equipment has been installed in accordance with their recommendations, and that all signalling devices of whatever manufacture have been operated or tested to verify their operation.

(ii).3 That the supervisory wiring of those items of equipment connected to a supervised circuit is operating and that the governmental regulations, if any, concerning such supervisory wiring, have been met to the satisfaction of inspecting officials.

14.4 Wireless Communications

(a) Overriding Principles

Both the Authority staff and Project Co staff will need wireless portable communication devices (wireless telephone and /or wireless personal digital assistants) for fast effective two-way voice communication. It is preferred that a common system be utilized throughout the Facility to allow the Authority staff easy access to Project Co staff and vice versa.

Not all Authority staff will need the wireless staff communication devices. The Authority staff who require portable communication devices are those who will require it for nurse call annunciation, need them for access to portable clinical software applications, those staff who are often on the move and need access to other staff, have no fixed office location such as OR staff and all doctors and nurse managers.

Project Co will design and install a WLAN infrastructure that is consistent with the rest of the Campus. VIHA Network Services will also manage the Voice over WLAN service leveraging the Voice over Internet Protocol (VoIP) serving the rest of the Campus.

Responsibilities between the Authority and Project Co for Wireless Communications will be as set out in Appendix 3D [Communication Systems Responsibilities Matrix]. Wireless infrastructure will be classified as equipment Category 3a, with Wireless System Active Components including Access Points (AP's) classified as Category 2* with the Authority responsible for specifying requirements on System Components and Network Components. After Authority acceptance the Authority will manage and maintain the Active Network Components including AP's.

(b) Design Requirements

Project Co will design the wireless communication to be compatible with the Authority's Information Management / Information Technology (IM/IT) departments requirements for the Wireless Communications System with respect to system components and network components.

Project Co will design, survey, specify, procure, install, and maintain the physical infrastructure for the Wireless Communications including cabling, wire management, demarcation, racks for POE equipment, and built-environment fit for use including environmental considerations, power, and backup (UPS) capacity. The Wireless Infrastructure will meet all requirements for the Authority specified System and Network Components.

(c) Quality Requirements

The wireless staff communication system will meet the IEEE 802.11x standard and allow sufficient bandwidth to display clinical data.

(d) Performance Requirements

Project Co will provide a Wireless Communications infrastructure consisting of a cabled infrastructure required to support the wireless access points, and all physical support components including electrical, environmental and sufficient space in the communications rooms. The Wireless Infrastructure will meet all requirements for the Authority specified system and network components.

The Wireless Communications System will consist of active network and system components, an application server, antennae base stations, line cards and software. Antennae base stations are to be located in concealed areas throughout the Facility to provide full coverage with no dead spots.

The wireless system will provide fit for use function throughout the entire Facility at a minimum density of one nodule per 50 m2. Project Co will complete a signal strength survey prior to deployment to identify ideal AP locations so that 100% Facility coverage is achieved. If the commissioning of the Wireless Communications System does not establish that the system has 100% coverage at the minimum density Project Co then will install at no cost to the Authority additional antennas and/or infrastructure as required to meet that standard.

At Service Commencement Project Co will conduct and provide to the Authority a post construction signal strength survey to confirm full compliance.

The wireless system will integrate with the nurse call system, the VoIP telephone system, voice mail system, dictation system, and the other data network system. It will be able to access Cerner and other Clinical Systems.

The wireless signalling is to be at a frequency or amplitude to not interfere with any medical equipment.

Wireless data security encryption techniques are to be employed by the system.

The Wireless Communications System server will provide integration with the nurse call system and other alarm systems to annunciate all necessary local alarms on the wireless handset.

All wireless access points are to be mounted in concealed locations throughout the Facility. Power over Ethernet (POE) for access points is required from an uninterruptible power supply.

Project Co will provide UPS's as required. UPS to be fed from emergency power distribution.

Wiring for system to be part of category 6a structured cabling plant.

14.5 Network interface (VoIP & Data)

(a) Overriding Principles

Project Co will provide the necessary physical infrastructure for the wired LAN infrastructure including cabling, wire management, demarcation, racks for network and system components, and built-environment fit for use including environmental considerations, power, and backup (UPS) capacity consistent with the rest of the Campus.

The Authority will after completion and commissioning of the Network interface infrastructure after Service Commencement, manage the LAN (VoIP & Data) networking services.

The Communications Systems provided by Project Co that are in digital format may run on the Facility network and integrate with the Authority's applications where they provide an advantage to staff and/or patients.

It is the intent of the Authority that electronic patient information is available at the bedside to assist clinical staff in performing their duties. This information is to be available on portable devices and run over the wired or wireless network. It is the intent that the device display information such as nurses call, code blue, video conferencing, patient / staff education, and patient monitoring where this creates efficiencies for clinical staff. These systems are to integrate with the IT applications and run over the common network platform.

(b) Performance Requirements

The Communications Systems are to be IP compatible and run over a standard Ethernet network.

Database for these systems will be HL7 compatible with an SQL open system architecture to allow key fields to be read form and written to the Authority's information technology software applications.

14.6 Nurse Call System

(a) Design Requirements

Prior to programming the nurse call system, Project Co will meet with the Authority staff to obtain functional programming requirements. Call assignments, staff communication device assignments, priority levels, day night shift mode, call annunciation locations, code blue response, other alarm systems response, Meditech interface capabilities, call display requirement, bulletin board requirements are just some of the programming issues. It is intended that the programming be simple but comprehensive.

Advanced nurse call system features will be included, such as information display systems, room tracking systems (i.e. Medical/Surgical, Mental Health IPUs), electronic bulletin boards, nurse tracking, patient tracking, and call buttons located on bedside computers, wireless computers, or integral to patient bed consoles.

(b) Quality Requirements

Installation will comply with CSA C22.2. and CSA Z32.04.

All systems will be from a single manufacturer.

(c) Performance Requirements

Project Co will supply and install nurse call systems in each patient care area in the new Facility.

Project Co will design, survey, specify, procure, install, and maintain the physical infrastructure for the nurse call system including cabling, wire management, demarcation, equipment, and built-environment fit for use including environmental considerations, power, and backup (UPS) capacity.

Since it is a life safety system, the nurse call system must have a reliability factor of greater than 99%.

Modern nurse call systems can take any alarm input and annunciate it for staff. Project Co will integrate the nurse call system with other alarm systems to annunciate alarms that clinical staff need such as patient wandering, code red (fire), code white (panic duress), code blue (cardiac arrest), patient monitoring systems and monitoring equipment.

The nurse call system will have the ability to integrate with an annunciator and on the Authority's wireless staff communication devices (PDA's or phones such as Vocera or Spectralink) for near instant alarm response. The wireless staff communication device will operate seamlessly with the nurse call system allowing two-way voice communication.

The nurse call system will be capable of integration with systems such as Cerner to allow automatic call up of the patient record on their wireless devices to give the clinical staff easy access to patient information.

The nurse call system will be connected to the network to allow a Project Co supplied server to track calls via nurse call management software. The call management software will record all calls from all departments, response time and allow trending and report generation. The programming server and staff communication device allocation server will also reside on the network and allow any nursing station computer access to monitor status of the system and with the appropriate password implement programming changes.

The nurse call system should be capable of seamless integration with the existing Dukane Pro Care 6000 System in the D & T Building. Provide necessary updates (software and hardware) to the existing system to facilitate this requirement.

Project Co will keep the technology current and refresh the nurse call system as required so that the nurse call system is never more than 15 years old.

All nurse call systems will have two-way voice capabilities as well as visual call or alarm indication.

All patient care rooms, treatment rooms, patient dressing cubicles, patient treatment areas, and bathrooms where patients may need to call for assistance will have a patient call cord. The call cord will be located for ease of access by the patient. A button only system will be utilized in mental health units. Cords to be cleanable and acceptable to the Authority Infection Control.

All patient care rooms, treatment rooms and other rooms where staff may need to call for assistance will have a staff emergency button. The button will be located for ease of access by the staff.

All rooms where a nurse call device is installed will have a multi-call classification dome light (minimum 4-lamps) to annunciate the calls. The dome light will be located to provide staff the best possible view on the outside of the room where the nurse call stations are located and lead responder to room call light.

All patient care rooms and patient bed or chair locations will have separate jack inputs for medical equipment monitoring or patient monitoring (such as bed exit).

Provide duty and tone stations.

All calls will be annunciated at nurse call master stations located at the main nursing desk and / or reception desk. Master stations will link together to allow shift programming (day/night) annunciation of calls at different nursing stations when and if nursing stations are unmanned. If there is no nursing station in department the nurse calls should annunciate at the reception of the IPU.

Each nurse call station will be individually programmable to allow multiple call classification and priority levels. At minimum, nurse call alarms will be normal patient call, staff emergency call, code blue, bed exit, priority patient call, bathroom call, shower call, anaesthetic call, clean room call, porter call and will be located in the appropriate room types, The call system will allow for cascading of call to higher priorities if they are not answered, will have time out call cascading if the calls are not cancelled and will be able to be displayed on the nurse call master, the wireless phone, and any other type of call display.

Locate all nurse call field panels in communication rooms as near as possible to the department they serve.

Utilize structured category 6a cabling in conduit for all nurse call system devices.

Fault monitoring to be a standard feature of the nurse call system. Alarms such as communication fault, power fail, and CPU fault will be standard features.

Project Co will be able to have the systems serviced, install additional components or program system within 2 hours of call origin. Parts need to be available within two (2) hours to keep this life safety system operational in the event of an extended component failure.

Make provision for electronic patient beds with built in nurse call buttons and automatic TV muting by providing appropriate jack and connecting to the nurse call system.

All nurse call systems will be supplied power from the emergency power system and have UPS backup that will provide for a minimum 1 hour of battery supply.

14.7 Public Address

(a) Overriding Principles

In general, the Facility's communication requirements are to be met without using the public address system. The public address system will be for use only for emergency calls, when other communications systems have not worked, or when general announcements are needed to communicate with staff and the public.

(b) Quality Requirements

The system will meet ULC 537 and NFPA standards.

All installation procedures will meet requirements of CEC Section 60.

(c) Performance Requirements

(1) System

(A) Provide a complete IED public address sound system consisting of microprocessor based control system, ambient noise analysis & control, power amplifiers, equalizers, paging stations, loudspeakers, software, programming, wiring, accessories, and UPS supplied backup power as specified herein.

(B) Project Co will design, survey, specify, procure, install, and maintain the physical infrastructure for the public address system including cabling, wire management, demarcation, equipment, and built-environment fit for use including environmental considerations, power, and backup (UPS) capacity.

(C) The system will be separate from the fire alarm system and will operate in all situations, with the fire alarm paging system paging as an emergency back-up

(D) During fire alarm signalling, the system will provide 10dB above ambient or at minimum 75 dB in all areas of the Facility.

(E) Components will be wired together to form an integrated system, in accordance with the manufacturer's recommendations.

(F) The system will integrate with the existing IED System in the Diagnostic and Treatment Building. Provide any required upgrade.

(G) The microprocessor will manage and control all system functions and hardware including microphone page stations and associated queuing, distribution of emergency announcements, local announcements and terminal announcements.

(H) The public address system will be fully integrated with the fire alarm system.

(I) The system will be a rack mounted, modular assembly using slide-in circuit boards in plug in card files to allow easy expandability and servicing. External connections will be made to removable compression terminals. All external connections will be made on back plane circuit boards to allow circuit cards to be removed for replacement without disconnecting cables.

(J) The public address system will be comprised of several subsystems, that when integrated together, form a complete system. These systems will include:

(i) Networked Industrial Computer for user configuration and control

(ii) Networked Computer based Announcement Control System (ACS) and associated software.

(iii) Ambient Noise Analysis system.

(iv) Equalization System

(v) Microprocessor based Microphone Paging Stations.

(vi) Power Amplifier systems

(vii) Courtesy Announcement System (CAS) software (bilingual French/English)

(2) Equipment

(A) Main system will be Innovative Electronic Designs (IED) with digital/record playback system.

(B) Provide microcomputer and announcement control system software for programming system.

(C) System to integrate with existing campus IED paging system.

(D) Loud Speakers

(i) Type 1 ceiling speaker will be Enforcer E810CW c/w 70V transformer tapped form 0.5 to 10W, round white flush baffle, backbox and H-Bar mounts for T-Bar ceiling

(ii) Type 2 ceiling speaker will be TOA F121CM c/w 70V transformer tapped from 1 to 20W, round flush baffle, surface backbox and H-Bar ceiling. Backbox and baffle will be natural modized aluminum colour.

(iii) Type 3 wall speaker will be TOA F240WM c/w 70V transformer tapped from 2.5 to 30W and WCB-24W mounting bracket.

(E) Microphone Stations

(i) Microphone stations will be IED 508 VFM-H (or HFM-H), 500 VFMH (orHFM-H) and 500 FME (expansion unit).

(ii) Equipment room microphone station will be IED 508SRM-H.

(iii) All microphone stations will be complete with 500 HH hardheld microphones.

(iv) Provide 508T-1 telephone interface station for interconnection with existing paging system telephone switch.

(F) Remote ambient noise sensors will be IED 540S-4 c/w backbox and 4” flush baffle.

(G) Amplifiers

(i) Amplifiers will integrate with existing campus IED paging system and will be rated as per the zoning schedule and complete with NC-DSP-A digital signal processor module.

(H) Provide rack mounted uninterruptible power supply (UPS) for the sound system central processing unit.

(3) Wiring

(A) Wiring will be run in conduit, cable tray, and underfloor duct system. Flexible armoured cable may be used for drops to devices on suspended ceilings or in frame walls.

(B) Wiring sizes and types will be in accordance with manufacturers recommendations.

(4) Testing

(A) The installation of the public address system will be complete only after programming and balancing of all speakers/components.

14.8 Mechanical control systems interface (BAS)

Project Co will provide a fully functional building management system whose primary function will be to control the mechanical systems within the Facility in accordance with Section 13.15(n) of this Schedule. This system will also display building related alarms at the Help Desk. The building management system will interface with the building electrical and Communications Systems. This system is to be utilized to annunciate security alarms, freezer alarms, lab alarms, medical equipment alarms, UPS, generator, and switchgear alarm, and control the building and site lighting (for energy management reasons) via its software program.

Project Co will be responsible for designing, procuring, installing, connecting, maintaining, and monitoring the infrastructure associated to both analogue temperature and digital alarm monitoring that is required for each freezer and medical fridge installed throughout the Facility. The analogue temperature for each refrigeration device will be trended/tracked on a continuous basis at 30min increments (avg) with monthly graphical reports provided by Project Co to the Authority. The system is to be used for energy management functions as well as energy related data acquisition and trending. The digital meters monitoring the electrical power systems are to be connected to this system.

Project Co will design, survey, specify, procure, install, and maintain the physical infrastructure for the mechanical control systems interface (BAS) including cabling, wire management, demarcation, equipment, and built-environment fit for use including environmental considerations, power, and backup (UPS) capacity.

14.9 Structured Cabling

(a) Design Requirements

(1) The cabling infrastructure is to be designed by a Registered Certified Data Designer (RCDD) or professional engineer.

(b) Quality Requirements

(1) The conduits, pathways, room layout, and design are to comply with the TIA / EIA – 569 Commercial building Standard for Telecommunications Pathway and Spaces.

(2) The cabling design and installation will comply with the TIA / EIA – 568b.1, B.2 and B.3 Commercial Building Cabling Standards and Optical Fibre Cabling Standards.

(3) Testing of the fibre optic cable will meet the TIA / EIA 526-7, 14 standards for Optical Power Loss measurement of single mode and multimode fibre cable plant.

(4) The management and administration of the cabling plant will be done in accordance with the TIA / EIA 606 standard – the Administration Standard for the Telecommunications infrastructure of Commercial Buildings.

(5) The grounding of the conduit pathways and components is to meet the TIA / EIA 607 Standard – Commercial Building Grounding and Bonding Requirements for Telecommunication.

(6) The structured cabling component will be of the same manufacturer. The system will be installed by a data contractor who is certified by one of the industry leaders consistent with the manufacturer's best warranty. A BIX cross-connect patch field system matching existing in the Authorities adjoining the Diagnostic and Treatment Building (D&T) is preferred.

(c) Performance Requirements

(1) Project Co is to provide and install a complete category 6a structured cabling solution throughout the Facility. If a category better than category 6a is the latest standard at the time of ordering, it will be priced and presented to the Authority to determine if they want to utilize the latest standard.

(2) The cabling infrastructure does not differentiate on the type of end-use device that connects to it. The cabling infrastructure is to be universal and allow all forms of end-use devices access to the different system types.

(3) All cables are to terminate in communication rooms sized in accordance with the TIA / EIA standard. Maximum cable distance from room outlet to communication room will be 70 meters.

(4) Communication rooms are to serve the floor they are on and are to be placed to maximize the area they serve.

(5) Cable types to be unshielded twisted pair and fibre optic multimode and single mode. The bandwidth requirements and distance limitations will determine the type of cable installed.

(6) A star wired cabling approach will be utilized to wire all outlet locations back to communication rooms on each floor. Wire all communication rooms to a main communication room within the Facility and wire the main communication room back to Room DT-0111or the main telephone room at DT-0117, as appropriate.

(7) All fibre and copper cables, terminations, and outlets will be labelled as per the VIHA-South Island Electrical guidelines for Acute Care and the VIHA Network labelling standard, as applicable.

(8) All rooms that have or are anticipated to have data, phone, video, or other end-use devices will have cable system drops run back to the communication rooms. It is anticipated that only storage, clean/dirty supply rooms, and some corridors will not have cable system drops.

(9) Each workstation locations to have a minimum of (3) network cables per. All blue cables with white jacks. Generic configuration.

(10) All rooms that have cable system drops will have at minimum 10% additional drops, all conduit pathways will have minimum 100% spare capacity, all cable trays will have at minimum 100% space capacity and all communication rooms will have 200% spare capacity (indicating that each communication room must have enough room for 100% more cable drops including supporting networking devices and equipment). All cabling will be run in conduit and cable tray.

(11) All ceiling spaces will have cable system drops for wireless network access devices, information display systems, patient entertainment, equipment and patient tracking, patient monitoring and other ceiling mounted digital devices or systems.

(12) Fibre optic cabling will be utilized to connect each communication room to the main communications room and from the main communications room to the computer room at DT-0111. Both multimode and single mode fibre will be provided. Provide a minimum 48-multimode fibre, and 24 single-mode fibre to each communication/data room. Provide at minimum 200% spare fibre strand capacity in the demarcation/termination panel in each communication room. Fibre optic and Cat 6a cabling will also be provided for rooms requiring video streaming, such as teaching/training, and video conferencing rooms.

(13) All cable drops will be terminated at both ends. The proper flame spread rating will be provided for the cabling system.

(14) Supply and install Multi-conductor twisted pair telephone style riser cables as required for Public Telephones, medical equipment, and other such analogue equipment requirements. Cables will be run from the main telephone room (DT-0117) to each communication/data room. Provide a minimum 100-pair cable terminated on a demarcation panel that has a minimum100% spare capacity in each communication room.

(15) Patch cables for all end-use devices will be provided in sufficient quantity to make each device operational plus 10% spare. Patch cable will allow complete connection from end to end.

(16) A cable management labelling software and electronic drawing system will be implemented by Project Co to track and manage the cable plant.

(17) Self-registration systems, electronic directional systems and patient education kiosks will be required in reception areas. Provide floor data outlets and floor power to connect these floor mounted systems as requested.

(18) Specialized systems requiring multiple drops will have sufficient drops at each location to ensure system operation.

(19) Project Co will design, survey, specify, procure, install, and maintain the physical infrastructure for the Structured Cabling System including cabling, wire management, demarcation, equipment, and built-environment fit for use including environmental considerations, power, and backup (UPS) capacity.

(20) Provide cable for all public phones, minimum 1 per lobby area throughout the Facility and at least 6 for the retail space at grade.

14.10 Video Conferencing (see post-disaster specifications)

(a) Design Requirements

(1) The audio / video conferencing systems will be designed and configured by qualified and experienced audio visual professionals knowledgeable in the application and use of audio/video conferencing systems.

(b) Post Disaster

(1) Project Co will design, provide, and install support structures including grounding and lightning protection as required by code for all post-disaster radio equipment antennas to be installed on the roof.

(2) Project Co will provide conduit pathways between the roof-top antenna locations to the rooms designated as Post-disaster

(c) Performance Requirements

(1) Project Co will design the Facility to permit the Authority to install a simple fixed video conferencing system, including monitors, cameras, microphones, automatic microphone controllers, amplifiers, speakers, video controllers, remote controls, codes and network connections.

(2) Project Co will design the Facility to include infrastructure for a video conferencing system in areas designated as requiring AV capacity, including teaching rooms and the lobby meeting space, that is compatible with the Authority's standard at the time of installation.

(3) Project Co will provide the physical infrastructure for the video conferencing system including conduits, demarcation, and UPS in the communications rooms where the cabling must terminate.

14.11 Patient Entertainment System

(a) Quality Requirements

(1) The Authority requires the capacity to provide patient entertainment, educational materials at service commencement and, as equipment and technology allow, telehealth and two way video conferencing within the patient bedrooms.

(2) This content will be accessed through a display (and, eventually a camera) located such that it is easy for a bed bound patient to view the display.

(b) Performance Requirements

(1) The Authority intends to provide in-room patient entertainment (includes TV, film, Internet, network integration for patient education, etc.).

(2) Responsibilities between the Authority and Project Co will be as set out in Appendix 3D [Communication Systems Responsibilities Matrix].

(3) Project Co will provide capacity for this system in all patient bedrooms, all lounges, the lobby, multi-purpose rooms and other rooms with audio visual capacity.

(4) The type of service is at the discretion of the Authority and either digital systems or standard analog television may be utilized.

(5) The locations of the data outlets for the Patient entertainment system are to be conveniently located directly adjacent to the bed and behind the location of the TV or video projector, as applicable.

(6) All cabling will be cat 6a and will be via the structured cabling system.

14.12 Patient Monitoring

(a) Quality Requirements

Wiring for these systems will meet TIA / EIA standards.

(b) Performance Requirements

(1) Project Co will provide the cabled infrastructure throughout the medical surgical floors of the Facility for a patient monitoring system and will install the Authority's access points/antennae throughout two of the medical surgical floors one of which is the floor that connects directly with the Diagnostic and Treatment Centre (level 3).

(2) Responsibilities between the Authority and Project Co for the Patient Monitoring System will be as set out in Appendix 3D [Communication Systems Responsibilities Matrix].

(3) Project Co will connect the system to the structured cabling system through to the local area network.

14.13 Central Dictation

The central dictation system for this Facility is part of the overall centralized system of the Authority.

Responsibilities between the Authority and Project Co for the Central Dictation System will be as set out in Appendix 3D [Communication Systems Responsibilities Matrix].

14.14 Security (CCTV, Access Control, Intrusion Detection, Panic, Staff Duress, Patient Wandering, Hold-up, Incident Reporting System)

(a) Design Requirements

(1) Responsibilities between the Authority and Project Co for the these systems will be as set out in Appendix 3D [Communication Systems Responsibilities Matrix].

(2) Project Co will determine security needs through a comprehensive threat and risk assessment analysis that Project Co will prepare in consultation with the Authority. Programming of ID cards, location of all security devices and monitoring requirements to be identified. All alarm annunciation requirements to be identified. The Authority's security personnel will monitor the security system from their present security office location in the Parking Garage. Project Co will be responsible for modifying the existing security desk to accommodate new monitors and connecting those monitors to the Facility by cable through the existing conduit running from the Diagnostic and Treatment Building to the Parking Garage.

(3) CCTV System:

(A) All CCTV cameras:

(i) Will be equipped with color;

(ii) all security cameras, will be monitored, switched, and recorded at the Protection Services Central Monitoring Facility located in the Parking Garage (central security station);

(iii) all clinical activity cameras are monitored and switched by the care team station – administrative for that IPU;

(iv) that are intended for low lighting levels under normal circumstances will be equipped with combination color and black and white capabilities;

(v) that are located at a secured or alarmed point within the intended area of view will have the camera control or video signal capable of being interfaced with the alarm signal and switched at the central security station;

(vi) will be provided within tamperproof enclosures with tamperproof center-pin reject hex nut screws;

(vii) that are pan-tilt-zoom cameras will be programmed to address privacy requirements; and

(viii) only cameras that are fixed, security cameras need to be located to be capable of facial identification;

(B) Location of CCTV cameras:

(i) all exterior doors to the Facility will have a fixed security camera coverage on the interior side;

(ii) in the main Facility lobby;

(iii) security camera coverage inside each elevator cab as referenced in Section 13.14 of this Schedule;

(iv) all exterior areas immediately adjacent to the Facility, including secured outdoor areas, will have a pan-tilt-zoom security camera coverage to monitor activity at all light levels;

(v) in Mental Health Care team Station – Administrative provide security camera coverage;

(vi) In Mental Health in any patient accessible common areas and rooms not directly observable form the Care team Station, and in Interview/Consultation rooms, and Secure Rooms provide clinical activity camera coverage;

(vii) In all of the bedrooms in the secure complex dementia and PICU units provide clinical activity camera coverage;

(4) Staff Duress and Panic

(A) provide a hard wired panic button at the discharge/lobby security, in all care team stations – administrative that;

(i) upon the initiation system will identify the location of the event; and

(ii) will display at the Parking Garage central security monitoring station;

(B) provide a silent staff duress alarm system throughout the Mental Health patient areas including secure outdoor spaces that;

(i) upon the initiation of a duress signal the system will identify the location of the event and the name of the staff person or device who initiated the alarm; and

(ii) will display at the Parking Garage central security monitoring station.

(5) Access Control

(A) Any door that is equipped with electric locks operated by proximity cards will have locking systems that will fail secure subject to Building Code requirements;

(B) All access controlled doors will be equipped with door position sensors and request-to-exit sensors or releases;

(C) All exterior entry doors will be equipped with proximity card access control on the exterior side;

(D) All doors from the stairwells into the Facility will be equipped with proximity card access control on the stairwell side;

(E) Each elevator cab as referenced in Schedule 3 Section 13.14 Conveying Systems will be equipped with proximity card access control that provides the ability to control access to any or all floors;

(F) Support and Lobby Spaces:

(i) All Support Spaces identified in Appendix 3A will be equipped with proximity card access control on the public side of the door;

(G) support services for Mental Health IPU will be via doors from the service elevator lobby. These doors will be alarmed when outside of normal business hours;

(H) Mental Health IPU's require:

(i) 2 locked doors between interior patient accessible areas and exterior unsecured space;

(ii) all doors intended for emergency use only will be alarmed locally at the Mental Health IPU reception desk, and also back to central security station monitoring;

(iii) alarms must be reset locally at the door where the alarm is sounding by a safety officer or authorized personnel using a special key;

(iv) all doors in and out of the IPU will be equipped with proximity card access control on the exterior side;

(v) all doors to spaces other than patient bedrooms and bathrooms; activity rooms; group therapy room and quiet room will be equipped with proximity card access control on the exterior side;

(I) Medical Surgical IPU's require:

(i) doors to the main IPU entry point; the service elevator foyer, if applicable, multi-use clinical standard, On Floor Room for Holding and Pickup and teaching spaces (as per Appendix 3A) will be equipped with proximity card access control on the public side; and

(ii) doors to teaching room standard, staff washroom, staff lounges, clean rooms/storage; OT splinting room (as per Appendix 3A) will be equipped with code lock access control on the public side;

(J) every other door in the Facility, other than those noted in 14.14(a)(5)(I)(i) and 14.14(a)(5)(I)(ii) above and those in medical surgical patient bathrooms, require keyed locks;

(b) Quality Requirements

All installation procedures will meet requirements of SEC Section 60.

(c) Performance Requirements

(1) The bi-directional signal/control between CCTV cameras and the monitoring station in the Parking Garage will be transmitted separately from the Authorities intranet.

(2) All security systems, except CCTV, are to connect to the Authorities intranet (Ethernet) network via the structured cabling system and network devices to allow the Authority the opportunity to review events and monitor the status of these systems from off site locations.

(3) All systems to be interconnected to the fire alarm system where required.

(4) The CCTV network server is to allow web-based access to all live and recorded images.

(5) An access control system is required that is PC based, contains an integral photo identification card system, can lock and unlock doors via time schedule, utilizes

proximity field effect technology, has sufficient capacity to handle at minimum 15,000 regional employees down to the field panel level, can grant or restrict access to employees via a programmable classification system, and run over a standard TCP / IP Ethernet network. The system will utilize a field server and allow multiple workstations to access this file server for control and annunciation purposes. All alarms will be annunciated at the facility management call centre / alarm management centre location and at the Authorities monitoring station at the Parking Garage at minimum.

(6) Doors that require access control will be equipped with door position monitors/contacts, request to exit sensors, and electric locks operated by proximity cards. Locking systems will be fail secure as a preference, or as required by code. The Door Control & Monitoring System will be integrated with the alarm interface unit and event recorder providing graphic display of door position status and operating interface for central locking/unlocking of doors. All entrance doors to the Facility that do not have card access control will include a door position contact that is connected to the card access system so that a door status signal may be sent from the door to the Authority's central monitoring centre located in the Parking Garage on an after-hours schedule.

(7) The access control system will be compatible with the Authority's existing system and allow new access cards for the Facility. If the access control system is not identical to the Authorities currently existing system then it will fully integrate and utilize the currently existing database of users, groups, and schedules. Integration will be such that any change to one system will effect and cause the same change on the other system with no additional input or action. Similar integration is required between the CCTV (event response, recording and review), Photo Badging, and Network Video Recording (NVR).

(8) The system will be digital CCTV system consisting of digital colour CCTV cameras located as needed, digital PC based network video recorder (NVR) complete with software that controls all parameters of each individual camera, pan tilt zoom functionality, frame by frame recording, pre and post alarm recording, motion detection, sequence switching, multiplexing, adjustable frame speeds, and will record all security cameras 24-hours per day, 7 days a week in real time. Fixed cameras will be equipped with vari-focal auto-iris lens to allow for scene coverage adjustment and lighting compensation in the field without lens changes. All CCTV cameras will be provided within tamperproof enclosures with tamperproof screws.

(9) The system will have capacity to store recordings for 30 days at four frames per second minimum. Provide file servers, workstations, and optical storage devices and connect to network. System will have network and web access for remote monitoring. System will be of sufficient quality to be used as court evidence in Canada. Camera control equipment and remote view station equipment will be equipped with password protection to limit access to the system.

(10) CCTV clinical activity monitors will be located out of public view as required to protect privacy.

(11) Alarm Interface Unit: interior and exterior CCTV security systems are equipped with dedicated video monitors, a 20" call-up video monitor and two recorders. One recorder operates in sequential mode. The second recorder operates in real time in alarm mode. The camera system will be equipped with an alarm interface unit providing automatic video switching, recorder operation and scene selection whenever an alarm event occurs in any sensor system. .

(12) A wired and wireless panic duress system will be provided by Project Co and Project Co will supply two hundred alarm initiating staff devices (FOB's) for deployment by the Authority.

(13) Security and communication systems, including badging and supplemental biometric identification systems, will be integrated across individual platforms allowing for systems display and operation from a computerized central control system.

(14) An electronic incident reporting system will be provided by Project Co that will record all security incidents at the Facility. The software will be a standard database system that allows any number of reports to be generated at the request of Project Co or the Authority.

(d) Intrusion System

(1) The Authority will provide security, including the intrusion alarm system via be based on the CCTV cameras.

14.15 Patient and Equipment Tracking

(a) General

(1) Project Co will provide a Facility wide tracking system that:

(A) has the capacity to send an alarm signal if a particular piece of equipment or a patient pass through a door that leads to the exterior of the Facility;

(i) upon the initiation of a signal the system will identify the location of the event and the particular piece of equipment or patient;

(ii) can annunciate at the security station in the lobby; and

(iii) will display at the Parking Garage central security monitoring station.

(B) Can locate a particular piece of equipment or a patient.

(b) Equipment Tracking

(1) Design Requirements

(A) Equipment will be tagged/bar-coded . Project co will provide cabled infrastructure for the Radio –Frequency Identification (RFID) and/or Wireless technology throughout the Facility. The infrastructure must enable and support this technology. The System may utilize the same infrastructure and antenna system as the Patient Tracking system

(B) Responsibilities between the Authority and Project Co will be as set out in Appendix 3D [Communication Systems Responsibilities Matrix].

(C) A PC based application will provide a presentation of assets by superimposing positional data on a facility floor plan and providing asset tag based information.

(2) Quality Requirements

(A) Wiring for this system must meet TIA / EIA standards.

(3) Performance Requirements

(A) The system will locate equipment location to within 10m anywhere in the Facility.

(B) The system can annunciate or alarm at or in the central security station and the security room in the lobby if equipment leaves the Facility;

(C) The system must be capable of being extended into the existing building on the campus.

(c) Patient Tracking and Wandering

(1) Design Requirements

(A) Patients may be provided with RFID, ID bands, badges, or bracelets. The tracking system will be capable of continuous monitoring throughout all locations of the Facility. The System may utilize the same infrastructure and antenna system as the Equipment Tracking system

(B) Responsibilities between the Authority and Project Co will be as set out in Appendix 3D [Communication Systems Responsibilities Matrix].

(C) A PC based web application will provide a presentation of all patient locations by superimposing positional data on a facility floor plan and providing patient based information.

(2) Quality Requirements

(A) Wiring for this system will meet TIA / EIA standards.

(B) System will locate patient location to within 10m anywhere in the Facility. Project Co may wish to utilize the Equipment Tracking antennae system in conjunction with wireless to complete this requirement.

(C) The system can annunciate or alarm at or in the central security station and the security room in the lobby if a patient leaves the Facility;

(D) System will be capable of being extended into the existing building on the site.

(3) System

(A) System will incorporate latest encryption techniques to secure patient ID and location.

(4) Wiring

(A) Wiring for this system will meet TIA / EIA standards and all relevant codes and regulations.

15. IT/TEL SERVICES

15.1 Basic Requirements

(a) Performance Requirements

(1) Responsibilities between the Authority and Project Co will be as set out in Appendix 3D [Communication Systems Responsibilities Matrix].

(2) Project Co will provide all information technology and telecommunications infrastructure including data/tel outlets, patch panels, cross connect panels, patch cables, and wire management related to:

(A) wired network;

(B) wireless network;

(C) telephone system

(D) all communication systems under Section 14

(E) radio frequency identification infrastructure;

(collectively, the "**Information Technology and Telecommunications Infrastructure**").

(3) The Authority will supply its own end-use equipment, including personal computers, laptop computers, tablet PCs, printers, photocopiers, facsimile

machines, medication barcode scanners/CRT and PDAs, (collectively, the "**End-Use Equipment**"), which the Authority may connect to the network and telecommunications infrastructure as part of the Authority's use of the Facility. The Information Technology and Telecommunications Infrastructure must support the Authority's End-Use Equipment.

(4) The Information Technology and Telecommunications Infrastructure will integrate with the Authority's existing systems in the Facility and with technology provided in the Authority's other facilities to allow seamless communication between the Facility and the other facilities.

(5) The Information Technology and Telecommunications Infrastructure must, to the greatest extent practical, be accessible for and amenable to future modifications and to future new systems.

(6) IP Protocol will be used for both telephone and data equipment.

(7) The Information Technology and Telecommunications Infrastructure and the Communication System Equipment provided by Project Co for the Authority must support all applications generally run by the Authority including but not limited to Cerner, Meditech and CAIS.

(A) The current applications on workstations are as follows:

(i) Standard Configuration:

(i).1 Microsoft Office Professional
(i).2 Microsoft Outlook
(i).3 CAIS (may be a subset depending on location)
(i).4 Patient scheduling
(i).5 Admitting
(i).6 Cancer registry
(i).7 Transcription
(i).8 Document management
(i).9 Clinical workflow
(i).10 Coding and abstraction
(i).11 Chart management
(i).12 Patient registration
(i).13 Clinical trials
(i).14 Results reporting
(i).15 Diagnostic image management
(i).16 Clinical data marts
(i).17 LOKI (timekeeping)
(i).18 PeopleSoft Portal (business applications for end-users)
(i).19 Microsoft Sharepoint Portal

(ii) Specialised Applications:
(ii).1 Microsoft Project
(ii).2 Visio
(ii).3 Pharmacy:
(ii).3.1 Mediware WORX (Pharmacy information system)

(B) Pharmacy: Mediware WORX (Pharmacy information system)The current applications on VIHA workstations are as follows:

(i) Clinical and Financial MediTech Applications
(i).1 E-Business & Related Applications
(i).2 Standard PC configuration:
(i).3 Microsoft Office Professional
(i).4 Microsoft Outlook
(i).5 Microsoft Sharepoint Portal
(i).6 Adobe Acrobat Reader
(i).7 IE
(i).8 Specialised Applications:
(i).9 Microsoft Project
(i).10 Visio
(i).11 MS Project Server
(i).12 MS InforPath
(i).13 MicroStrategy BI Tool
(i).14 Pagemeker
(i).15 Other:
(i).15.1 Picis Food 7 Nutrition System
(i).15.2 Human Resources Portal Software
(i).15.3 Medical Equipment Management System (HECS)
(i).15.4 Home Support - Procura
(i).15.5 Home Care - InterRAI system (Meditech)

15.2 Network Equipment

(a) Quality Requirements

(1) Provision and installation of network equipment will be in accordance with all applicable IEEE and EIA/TIA standards including the 802.1 and 802.11a,b, g & n, 802.3 standards.

(b) Performance Requirements

(1) Responsibilities between the Authority and Project Co will be as set out in Appendix 3D [Communication Systems Responsibilities Matrix].

(2) The convergence of the three media types (voice/video/data) will be supported by the network equipment and all equipment (including but not limited to the main

telephone system, video conferencing, dictation, fax, transcriptions, and all information systems) will be supported and run over this network.

(3) The Facility will have a complete structured cabling and complete wireless network infrastructure that will allow the use of all forms of wired or wireless communication devices that are commonly used in facilities similar to the Facility. The configuration of these structured solutions will consist of a main incoming telephone/video/data service room (in either DT-0117 or DT-0111).

(4) Project Co will provide a network capable of handling all of the Authority's applications, Project Co is responsible for integrating FM applications.

(5) Firewalls, security, intrusion detection systems, etc. will be provided by the Authority.

(6) Communication rooms in the Facility require fully redundant stackable or modular high density layer 2/3 switches to service the local area networks.

15.3 Wireless infrastructure

(a) Quality Requirements

(1) The wireless network components will meet IEEE 802.11x standards.

(2) Responsibilities between the Authority and Project Co will be as set out in Appendix 3D [Communication Systems Responsibilities Matrix].

(b) Performance Requirements

(1) The entire Facility is to be provided with a digital wireless network infrastructure that will allow wireless end-use devices access to the Authority's network and all its associated applications.

(2) Project Co will provide a complete wireless network throughout the Facility with no dead spots allowing any standard network applications or telephone application to be utilized on the wireless end-use devices.

(3) The wireless infrastructure and system will provide full functionality throughout the entire Facility at a minimum density of one nodule per 50 m2.

(4) The wireless transmitters will not adversely affect other biomedical equipment.

(5) Structured cabling will connect wireless access points to the communication rooms.

(6) The wireless infrastructure will support for VOIP inter-staff communication.

(7) All access points and wireless components will be seismically supported.

(8) Sufficient bandwidth will be provided for the wireless system for all current applications in the Facility plus 100% additional capacity.

15.4 Telephone Equipment

(a) Overriding Principles

(1) The Authority has established common technology platforms for their telecommunications services including abbreviated dial plans, centrally managed systems, provision of call centre and networked voicemail systems. RJH is part of this technology plan and the Facility will also form part of this technology plan.

(2) Responsibilities between the Authority and Project Co will be as set out in Appendix 3D [Communication Systems Responsibilities Matrix].

(b) Quality Requirements

(1) The telephone equipment is to comply with all BICS/IEEE and EIA/TIA standards.

(c) Performance Requirements

(1) VoIP telephone technology will be utilised.

(2) The telephone equipment will fully integrate with the Authority's existing telephone network and operate seamlessly.

(3) The telephone equipment is to be CSA and ULC approved.

(4) All standard voice mail features will be provided as well as networking and integrating this telephone switch and voice mail system into the Authority's telephone network.

(5) The VoIP Network will offer the following features, IP technology, computer telephone integration, speech recognition, unified messaging, integrated wireless telephone, connect to the existing coordinated dialling plan, interactive voice response, automatic call distribution, system administration software, music on hold, centralised networked voice mail, call centre functionality and centralised attendant.

(6) The VoIP will be integrated to the public address (overhead paging) system. Provide and install the telephone interface modules and paging zone modules.

(7) The VoIP Network will integrate into the Health Authorities' numbering plan.

(8) If Project Co intends to use this switch for their telecommunication needs, they are to include additional capacity and functionality as required. The Authority's requirements are as listed below.

(A) All locals to support all telephones identified in the Equipment List both wired and wireless plus 10% spare.

(B) All single line sets identified in the Equipment List, plus 5% spare.

15.5 Project Co End-Use Devices and telecommunications equipment

(a) Project Co will provide all of its own End-Use Equipment and telecommunications equipment to suit Project Co's requirements.

(b) Project Co cannot connect any of its own End-Use Equipment or telecommunications equipment on the Authority's network and telephone VoIP Network, unless they obtain prior written permission from the Authority.

(c) Project Co is responsible to pay for any additional software licences required to operate Project Co's End-Use Equipment and telecommunications equipment on the Authority's network and telephone VoIP Network.

(d) Project Co's own End-Use Equipment and telecommunications equipment that have been approved by the Authority for connection must be fully compatible with the Authority's network and telephone VoIP Network.

(e)

APPENDIX 3A

SUMMARY OF ACCOMMODATIONS

APPENDIX 3B

SPACE DESIGN COMFORT AND PRESSURIZATION CRITERIA

Type of Room / Area Designation	Design Temp [°C]	Permissible Temp. Setpoint Adjustment Range Min / Max [°C]	Temp. Control Tolerance From Set point [°C]	Return Air Humidity Setpoint Winter – Summer [% RH]	Humidity Control: Tolerance From Setpoint [% RH]	Relative Pressurization: Differential Pressure Setpoint & Tolerance [Pa] (Note 1)	Supply Air Volume: Tolerance from Design Air Flow Quantity	Return or Exhaust Air Volumes: Tolerance from Design Air Flow Quantity
Protective Isolation & Burn Bed Room (Positive)	24-30	21 / 32	±1.0	70	± 5.0%	P 7.5 Pa ±2.5 Pa Relative to Corridor	± 5%	± 5%
Infectious Isolation Bed Room (Negative)	24	21 / 26	±1.0	33 - 55	± 5.0%	N 7.5 Pa ±1.25 Pa Relative to Corridor	± 5%	± 5%
Isolation Ante-Room	24	21 / 26	±1.0	33 - 55	± 5.0%	P or N: Depends on Room (see Note 2); 3.75 Pa ±1.25 Pa	± 5%	± 5%
Typical Patient Bed Room (Note 3)	22-24	21 / 26	±1.0	33 - 55	± 5.0%	E	±10%	± 10%
Medication Rooms	24	21 / 26	±1.0	33 - 55	± 5.0%	P	± 10%	± 10%
Clean Utility	24	21 / 26	±1.0	33 - 55	± 5.0%	P	± 10%	± 10%
Soiled Utility	22-24	21 / 26	±1.0	33 - 55	± 5.0%	N	± 10%	± 10%
Nursing Stations	24	21 / 26	±1.0	33 - 55	± 5.0%	E	± 10%	± 10%
Patient Care Corridors & Public Corridors	24	21 / 26	±1.0	33 - 55	± 5.0%	E	± 10%	± 10%
Non Patient Corridors	24	21 / 26	±1.0	33 - 55	±5.0%	E	±10%	±10%
Waiting, Reception,	24	21 / 26	±1.0	33 - 55	±5.0%	N	±10%	±10%

Lounges								
Washrooms, Bathing Facilities	24	21 +/ 26	±1.0	33 - 55	± 5.0%	N	N/A	± 10%
Offices & Administrative Areas	24	21 / 26	±1.0	33 - 55	± 5.0%	E	± 10%	± 10%
Conference	24	21 / 26	±1.0	33 - 55	± 5.0%	N	± 10%	± 10%
Staff Locker Rooms	24	21 / 26	±1.0	33 - 55	± 5.0%	N	± 10%	± 10%
Storage Rooms	24	21 / 26	± 1.0	33 - 55	± 5.0%	N	± 10%	± 10%
Note 1: Pressurization: P = Positive; N = Negative; E = Even (pressurization not required)								
Note 2: Ante-rooms for Protective Isolation Rooms will be positively pressurized. Ante-rooms for Infectious Isolation Rooms will be negatively pressurized.								
Note 3: Typical Patient Bed Rooms include Mental Health, Medical-Surgical, and Renal Dialysis.								
Note 4: The Authority may adjust the design temperature and/or humidity of specific rooms or areas in the Facility to accommodate medical needs and the "Permissible Temp. Setpoint Adjustment Range Min / Max" and/or the "Return Air Humidity Setpoint Winter – Summer [% RH]" will be adjusted accordingly for that specific room or area								
Note 5: Design will include separate control and monitoring for all the Type of Room / Area Designation listed above, except where the room or space is only provided with exhaust such as Isolation Ante Rooms, Washrooms, Soiled Utility or small Storage Room.								
Note 6: Requirements to maintain temperature, pressure and humidity control setpoints and tolerances in a specific room are not applicable when the window in that room can be shown to be in an open position.								

APPENDIX 3C

SPACE CLASS RATINGS, VENTILATION AND BACKGROUND NOISE REQUIREMENTS

Type of Room / Area Designation	Class	Minimum Outdoor Air Changes per Hour [ACH]	Minimum Total Air Changes per Hour [ACH]	All Air Directly Exhausted to Outdoors	Air Permitted to be Circulated Within Room Units	Filter Efficiency (pre-filter / main filter) [MERV] (Note 6)	Maximum Background Noise Level [NC]
Protective Isolation & Burn Bed Room (Positive)	I	5	15	--	No	8 / 17	25-35
Infectious Isolation Bed Room (Negative)	I	2	12	Yes (Note 4)	No	8 / 17	25-35
Isolation Ante-Room	I	2	10	Yes	No	8 / 17	25-35
Typical Patient Bed Room (Note 5)	II	2	6 (Note 2)	--	--	8 / 15	25-35
Medication Rooms	II	2	4	--	--	8 / 15	25-30
Clean Utility	II	2	4	--	--	8 / 15	30-40
Soiled Utility	II	2	10	Yes	No	(Note 1)	30-40
Nursing Stations	III	2	6	--	--	8 / 15	30-40
Patient Care Corridors & Public Corridors	III	2	4	--	--	8 / 15	30-40
Non Patient Corridors	III	2	2	--	--	8 / --	30-40
Waiting, Reception, Lounges	III	2	6	Yes	--	8 / --	30-40
Washrooms, Bathing Facilities	III	Optional	10	Yes	No	(Note 1)	30-40
Offices & Administrative Areas	III	2	6	--	--	8 / --	30-40
Conference	III	(Note 3)	--	--	--	8 / --	30-40
Staff Locker Rooms	III	2	6	Yes	No	8 / --	30-40
Storage Rooms	III	--	2	--	No	8 / --	30-40

Note 1: These rooms are generally exhausted only, with supply air transferred from an adjoining space. If air is supplied directly to this room, filter efficiency to be the same as the adjoining space.
Note 2: Minimum total air changes may be reduced to 4 ACH if supplemental heating and/or cooling systems area used (eg: radiant or hydronic systems).
Note 3: Minimum ventilation to be determined in accordance with ASHRAE 62.1-2004
Note 4: Infectious Isolation Rooms to be served by dedicated non-recirculating exhaust and filtered as required by local authorities. Washrooms for these rooms will be exhausted using the same exhaust system as the room itself. Refer to Section 15.12.
Note 5: Typical Patient Bed Rooms include Mental Health, Medical-Surgical, and Renal Dialysis.
Note 6: Dashes (--) indicate only one filter bed is required. MERV 17 is equivalent to HEPA filtration.

APPENDIX 3D

COMMUNICATION SYSTEMS RESPONSIBILITY MATRIX