Table 11.1
Common area requirements
(See Clause 11 and Tables 8.3, 8.8, and 9.1.)

Item no.	Room name	Net area, m²	Requirements and recommendations
1	Assessment room — General (small group counselling)	11.0	**Mandatory:** A hand hygiene sink shall be mounted on the wall adjacent to the door. **Advisory:** a) A privacy curtain should be provided to shield the patient from corridor view if door is open. b) Depending on the program function of this room, it may be equipped with furniture or an exam table. c) The room should have a mirror on one wall, mounted low, to be used by the patient in a sitting position. d) A 1500 mm long base cabinet with closed cupboards above should be provided along one wall. e) To provide flexibility of use, consideration should be given to increasing the size of this room from the minimum size so that it matches the net area of a standard exam room (12.0 m²).
2	Breastfeeding room	7.5	**Mandatory:** a) A wall-mounted hand hygiene sink shall be provided adjacent to the door. b) The room shall include a change table. **Advisory:** a) Comfortable furniture, including a rocking chair, should be included in the room. b) Dimmable lights should be provided. c) A base cabinet of 1500 mm and wall cabinets above should be provided for storage of supplies and equipment. d) Equipment for music should be provided to enable mothers to bring their own music.
3	Central staff station (nurse station)	Varies according to HCF size and delivery model 4.6 per workstation and additional circulation space, storage, equipment	**Mandatory:** a) There shall be sufficient space around and within the station for the movement of chairs and people. Space for a table, chairs, and telephone should be provided. b) Network and phone line services shall be provided to support telephone and data connections. c) A hand hygiene sink shall be located within the nursing station, or within 6 m.

(Continued)

Table 11.1 (Continued)

Advisory:

a) The staff station should be located in an area easily accessible from all areas of the department, minimizing the walking distance for the staff.

b) The station should consist of a work counter, at sit down height (about 750 mm), surrounding the unit, with a short wall 1200 high providing the immediate privacy for the workspace.

c) One or more computer workstations should be provided.

Note: *The total number of users, including all disciplines, should be considered when determining the number of computer and general workstations.*

d) Work counters should be deep enough for computers to be placed on them and be able to accommodate a keyboard tray wide enough for the keyboard and mouse to be placed side-by-side.

e) Glass privacy screens should be provided where needed to maintain security and confidentiality. The design should allow staff to view surrounding areas as needed.

f) A break in the privacy partition should be maintained to provide access for patients in wheelchairs.

g) Noise control and task lighting should be incorporated into the work area design.

h) A nurse call or intercom should be provided.

i) A pneumatic tube station (if system is included in the HCF) should be located within easy access of unit clerk workstation.

j) Storage space should be provided for the storage of forms, stationery, professional use manuals, and educational materials.

k) An area for a central monitoring station (if included as unit equipment) should be provided.

l) Additional storage space should be provided for printers, copiers, fax machines, manuals, transmittal documents, patients' files, and other items.

Note: *There should be sufficient space for user traffic to access these areas.*

m) The staff station for inpatient mental health should be secured as appropriate for the patient population and as agreed to by the design team representing the area.

n) Work areas may be centralized or decentralized and satellite work areas may also be implemented.

o) Care should be taken to ensure the appropriate number of electrical and data outlets are required for computer or PACS applications.

p) Height adjustable workstations should be used to accommodate a range of user sizes and work preferences (i.e., seated posture, standing posture).

Note: *The design should take into account tasks that involve repetitive reaches and arrange the elements of the station to minimize strain. The design should consider the position of monitors with respect to overhead lights, glass, and shiny surfaces, and arrange the elements to minimize glare.*

(Continued)

Table 11.1 (Continued)

4	Change/ locker room Purse Half Full	Varies; assume the following space per locker: 0.15/locker 0.40/locker 0.70/locker	**Mandatory:** a) The room shall be located near the staff room for shift changes. b) Change cubicles, shower facilities, and washroom facilities shall be provided c) Lockers shall be located within or immediately adjacent to services where work apparel needs to be changed for infection prevention and control reasons before staff moves through the HCF. **Note:** *These areas include ORs, MDRD, and other locations as indicated by the functional program.* d) Security needs shall be considered. **Advisory:** a) Lockers should be next to the staff lounge and staff washrooms. b) Half-size lockers may be used. c) Lockers should be assigned to a single individual.
5	Charting alcove	1.0 — for viewing of a single room 1.4 — when space is shared between two rooms/two staff	**Mandatory:** a) Windows shall be provided at the alcove so the patients in the adjacent rooms can be observed while staff performs documentation duties. b) Storage shall be provided for charts and paper. **Advisory:** a) Pull-down shades should be considered on the observation window so that they can be closed when staff are not observing a patient. b) The alcove should contain a counter deep enough for a computer and be able to accommodate a keyboard tray wide enough for the keyboard and mouse to be placed side-by-side. c) An alcove should be designed to accommodate two staff. d) Patient supplies should not be kept at the alcove. e) A printer may also be provided if required. f) There should be sufficient clearance for movement of people and materials behind seated users.
6	Chart storage	Varies — accommo-date 5 cm binder per patient	**Advisory:** a) The location and organization of this space should provide for reallocation to another function when an electronic documentation system is in place. b) Space should be allowed for one 2 in binder per patient, with remaining documentation in health records (more space will be required for mental health patient charts). c) Charts should be in an accessible location that is easy to reach for users (i.e., maximum horizontal reach of 520 mm and vertical placement between elbow and shoulder height). d) Chart storage areas may be reduced if electronic health records are used.

(Continued)

Table 11.1 (Continued)

7	Classroom/ meeting room/ educational facilities	Seating for 6: 15.0 12–15: 30.0 20–25: 42.5 25: 42.5 plus 1.4 for every additional seat	**Mandatory:** a) Education facilities shall be provided to meet program requirements in care areas. This may include a dedicated or shared space with the consultation room, complete with computer access and audio-visual equipment. b) Education facilities shall be provided to meet program requirements in support services areas (e.g., MDRD, laboratories). c) Inpatient continuing care centres shall review service and program focus to define specialized teaching needs. **Mandatory teacher space (pediatric and adolescents):** The room shall meet applicable requirements. **Note:** *Refer to the local or provincial/territorial Education Act.* **Advisory:** a) Space requirements assume seating only; additional area could be needed for a podium, stage, seat storage, etc. as necessary. b) Tables and chairs should be provided that provide the greatest flexibility. **Note:** *Furnishings should be light, movable, and stackable.* c) Whiteboards, smartboards, or equivalent should be provided. d) A base cabinet should be located near the entrance to the room for storage of equipment and supplies used in the room. e) A full-height cabinet for the audio/visual equipment should be provided. f) Provision should be made for projection or display of educational material. Screens and monitors should be wall- or ceiling-mounted, unless the size necessitates a floor stand. g) Access to a common media or computer room, or a multi-purpose room with a computer, should be considered. h) A dialysis box may be provided for teaching.

(Continued)

Table 11.1 (Continued)

8	Clean supply/ utility room	Varies according to delivery model	**Mandatory:** a) Size varies by facility and required function. An enclosed room shall not be less than 11.0 m² (an alcove with double doors may be smaller). b) Areas for storage of clean and sterile supplies shall conform to CAN/CSA-Z314. c) Clean and soiled utility rooms shall be separated spaces. d) All storage of medical and surgical supplies shall be in mobile shelving or automated dispensing cabinets. e) All storage for linen shall be in mobile shelving and the cart shall be covered when transported to the room. f) Access to the room shall be limited to clinical and support staff. g) If reprocessing of medical equipment is performed, the space shall meet the requirements of CAN/CSA-Z314, as applicable. h) The room shall have designated locations for the types of item being stored, including i) clean and sterile supplies; ii) clean linen; and iii) crash carts. i) The room shall be conveniently located, close to the point of use for the supplies. j) Decontamination, or cleaning up, of supplies shall not be permitted in the clean utility room. k) Shelving units or cart surfaces shall have cleanable, smooth, and non-porous surfaces tolerant of hospital disinfectants. l) Storage of equipment and supplies shall not be exposed to direct airflow from the HVAC system in accordance with CAN/CSA-Z314. Storage should be away from the window, due to the risk of condensation. m) Flooring shall be of seamless impermeable, non-slip material. n) The principles of ergonomics shall be addressed when designing the storage space and locations of supplies. o) Shelving for clean and sterile supplies shall be at least i) 230 mm off the floor; ii) 450 mm from the ceiling; and iii) 50 mm from outside walls. p) Clean utility rooms might have specific needs depending on the clinical unit. Specific needs shall be identified in the functional plan and provided for within the space. q) If supplies are not broken down on delivery, provision shall be made for very high volumes of cardboard.

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Table 11.1 (Continued)

	Advisory: a) The room should be located close to the centre of the care area. b) Clean utility rooms may be centralized or decentralized depending on the delivery of care. c) Wire racks should be used for shelving to prevent dust accumulation, however top and bottom shelves shall be solid. d) Access to the clean utility room may be from two sides of the care space. e) Wall finish materials should be smooth and impact-resistant wall board where heavy carts are exchanged in the space. f) Flooring finishes should be able to withstand rolling equipment and provide minimal rolling resistance. g) Wall base and floor edges should be an integral cove base, tightly sealed against the wall, and constructed without any gaps. h) Clean rooms that support inpatient critical care units should be the same size but more rooms should be provided evenly spaced within the unit.

(Continued)

Table 11.1 (Continued)

9	Decentralized equipment storage (within the services)	Varies by facility and required function	**Mandatory:** a) Each inpatient accommodation location shall have designated storage for equipment to be stored within the space. b) The allocated space shall be determined based on the needs identified in the functional program, and in no case shall be less than 2% of the floor space of the service. c) Storage of equipment in corridor spaces shall not be incorporated into any HCF design. d) Equipment storage rooms shall conform to the equipment manufacturer's requirements for clearance around stored equipment. e) Storage areas shall be lockable, with access restricted to clinical and support staff. A safe working environment shall be provided. f) Shelving units or cart surfaces shall be cleanable, smooth, and non-porous surfaces tolerant of hospital disinfectants. g) Wall finishes shall be smooth and cleanable. **Note:** *Additional equipment storage in the form of alcoves or dedicated spaces could be needed based on the types of equipment to be used in the care area.* h) Recharging capabilities shall be provided for all equipment (and the need to provide excess charging capacity should be considered for flexibility). i) Storage space shall be provided that is convenient to each program/activity area. j) Dedicated space, subdivided or separated, shall be provided for large and small equipment. k) Stored items shall be easily accessible. l) Easy handling of supplies and equipment shall be ensured. m) Storage space shall be designed (i.e., with the appropriate type, location, and amount) to accommodate the expected equipment inventory. n) Shelving systems that are adjustable and easily maintained shall be provided. o) The room shall be provided with open shelving along one side of the space. **Note:** *Where possible, storage should be decentralized so that materials are close to the clinical rooms.* p) Equipment storage rooms shall conform to the equipment manufacturer's requirements for clearance around stored equipment. **Note:** *Additional equipment storage in the form of alcoves or dedicated spaces could be needed based on the types of equipment to be used in the care area.*

(Continued)

Table 11.1 (Continued)

			Advisory: a) Electrical receptacles and mechanical outlets should be designed to suit the equipment to be stored in each equipment storage room. b) Equipment rooms should not be used for storage of equipment in need of repair or supplies other than those required for the safe and efficient operation of the equipment stored in this room. c) Wire racks should be used for shelving to prevent dust accumulation. d) Wall finishes should be impact resistant where heavy devices or objects with sharp or protruding edges and corners are stored. e) Flooring finishes should be able to withstand rolling equipment and provide minimal rolling resistance. f) Storage for beds not in use should be provided unless it is provided at other locations within the HCF. g) Storage for clean and soiled equipment should be located for easy and efficient access, and be consistent with the anticipated circulation patterns. h) Storage areas may serve more than one unit. i) Consideration should be given to storage requirements for all care delivery support services, building services as well, as the therapeutic equipment services, in order to determine where storage services can be combined and what their relationship to each other can imply. j) Provision of overflow space to meet unexpected storage situations should be considered. k) A clear door opening width of at least 1200 mm should be provided to allow for easy movement of items. l) For an equipment holding alcove/room, i) the alcove/room should be located so as to minimize travel distance for staff (decentralized for large services); and ii) all potential equipment storage needs and service requirements should be considered. **Note:** *Beds not in use should be stored in locations convenient to the occupied care area, but should not be stored in the corridors. Special provisions for storage of beds not in use might be necessary.*
10	Departmental resource library	Varies according to delivery model	**Advisory:** a) The room should provide access to information via books, periodicals, and audio video. b) Computer stations should be provided against one wall. c) An open bookshelf should be provided along another wall for storage of books and periodicals. d) Tables and chairs should be provided for laying out books and other materials. e) A storage cabinet should be provided for storing audio, video, and other equipment.

(Continued)

Table 11.1 (Continued)

11	Diagnostic viewing workstation	4.6 per workstation	**Mandatory:** a) The diagnostic viewing alcove shall be a separate space or integrated into the other staff work areas depending upon technology used and function of the clinical area. b) A workstation with film illuminators, PCs, or PACS units (depending on the technology used) shall be included. c) The alcove shall have dimmable lights and individual task light at each workstation. d) For an ECG/EEG data management workstation, the room area should be a minimum of 16.0 m^2 and it shall include the following: i) a sit-down counter (750 mm high) along the longer wall, for computers; and ii) a wall shelf for reference material above the counter. e) Computer access shall be provided in the alcove as well as systems to review patient EEGs/ECGs in confidential space.
12	Dictation/ review workstation	4.6 per workstation	**Mandatory:** a) This station shall be located adjacent to the central staff station to ensure access to patient documents and ease of communication with the staff. b) The station shall be provided with a 750 mm deep counter wide enough for two persons. c) A shelf, 300 mm deep, shall be provided for patients' records and other documentation. d) The alcove shall provide audio privacy for confidential information purposes. e) A telephone shall be provided. f) Access to the HCF dictation system shall be provided. g) The workstation shall have a HCF system computer. h) PACS shall be provided. i) Acoustic separation shall be provided. **Advisory:** Careful consideration should be given to the equipment chosen for dictation.

(Continued)

Table 11.1 (Continued)

13	Dining room	3.0 per occupant	**Mandatory:** **Note:** *Space requirements assume seating only; the servery, kitchen, etc. have not been included in this space.* a) A minimum 1800 mm-wide entryway shall be provided, whether doors are incorporated or not. b) There shall be a minimum 1800 mm clearance between tables. c) There shall be a minimum 1100 mm clearance between the backs of chairs/wheelchairs in sitting position at the tables. d) Tables shall have a minimum width/diameter of 1370 mm. e) Ice/water shall be patient-accessible at all hours. f) Storage shall be provided for ADL equipment (adaptive utensils, etc.). g) Space for stackable chairs shall be available. h) A hand hygiene sink shall be provided in each subdivided space. i) The size of tables shall assume that a minimum 50% of the population requires assistance with feeding. j) Feeding stools shall be height-adjustable. k) Daylight and views to the outdoors shall be provided. l) Multiple safe, accessible electrical receptacles for specialized equipment shall be provided near tables. m) Additional space shall be provided for family/visitors (percentage to be determined), including separate family dining space per unit. n) A nurse call system shall be readily accessible. o) Planning for the space shall assume that 100% of the population is in wheelchairs. p) For renovations, at least 1.5 m^2 per bed shall be available for dining. Additional space might be required for outpatient day care programs. **Advisory:** a) An ADL counter for patient use should be considered, either in the dining room or nearby, based on the functional program. b) Height-adjustable tables should be used. c) Tables with locking casters should be used, for ease of movement. d) Contrasting colours between the table edge and floor should be used for ease of orientation. e) Homelike features should be provided. f) The design should consider the use of round tables, as these are more easily accessible for both patients and caregivers. g) Additional space might be required for outpatient day care programs. h) There should be direct access to an outdoor area for special events. i) Patient areas for both larger and smaller groups should be provided. j) The room should be sub-divided to enable multi-purpose activities.

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Table 11.1 (Continued)

14a	Examination room		**Mandatory:** a) Each examination room shall have a minimum clear floor area according to the space requirements, exclusive of fixed casework. b) A wall-mounted hand hygiene sink shall be located immediately adjacent to the entrance of the room/space, and there shall also be a hand hygiene station. In spaces with multiple examination cubicles separated by curtains, hand hygiene sinks shall be provided at a ratio in accordance with Clause 7.5.12.2.1. c) A privacy curtain shall be located adjacent to the door, but away from the door swing. Another curtain dividing space around the exam table shall be provided. d) The exam table shall suit the function of the room. e) A blood pressure cuff, paper towel dispenser, and hand hygiene station shall be mounted next to the exam table. f) A mirror above the sink and coat hooks shall be mounted adjacent to the door. g) A soiled linen hamper and soiled garbage container shall be provided. h) A nurse call system shall be provided. i) The minimum door width shall be 1050 mm (with a 600 mm side leaf). j) A minimum 1800 mm turning circle shall be provided for standard wheelchair accessibility on one side of the therapy room. k) Multiple electrical receptacles shall be provided to allow flexibility in furniture/lighting placement, as well as for services for splinting, etc. l) Sharps disposal shall be provided in a safe location and near the point of use. m) Provision shall be made within the room for electronic charting and access to health records. n) Medical services (e.g., electrical connections, medical gases, medical vacuum) shall be provided through a medical supply unit.
	Standard exam room	13.0	
	Scooter access	14.0	
	Special purpose exam room	13.0	
	Exam cubicle, open (chair)	7.5	
	Exam cubicle, open (bed-stretcher)	9.5	
	Exam cubicle, enclosed (chair)	8.5	
	Exam cubicle, enclosed (bed-stretcher)	13.0	
	Exam room (partial walls on 3 sides)	11.0	

(Continued)

Table 11.1 (Continued)

Note: *Medical services may be provided from overhead articulating arm(s) or from a wall-mounted service panel.*

o) The room arrangement shall provide for access and clearance (800 mm) on one side and at the foot of a patient accommodated on a HCF-sized stretcher.

p) Provision should be made for telehealth (e.g., through room colour, lighting, acoustics, the selection and placement of furniture, and adequate space for telehealth equipment).

q) An exam light shall be provided over the therapy area.

r) Examination rooms used for pelvic exams shall allow for the foot of the examination table to face away from the door.

s) Where renovation work is undertaken, every effort shall be made to meet these minimum standards. In such cases, each room shall have a minimum clear area of 9.0 m^2, exclusive of fixed or wall-mounted cabinets and built-in shelves.

t) For special purpose examination rooms:
   i) the room arrangement shall permit a minimum clearance of 800 mm at each side and at the foot of the examination table, bed, or chair;
   ii) minimum clearance around the treatment chair shall be 800 mm; and
   iii) space to transfer a patient from a stretcher shall be provided.

u) For an open examination area,
   i) a curtain track shall be provided around three sides;
   ii) staff workstation, hand washing facilities, and supplies shall be convenient and provided at a ratio in accordance with current infection prevention and control guidelines; and
   iii) additional supports (i.e., warming cabinet, nourishment station, medication cabinet, procedure carts, clinical scale, linen hamper, mobile lights, patient washrooms, clean supply, and soiled utility rooms) shall be convenient to the overall treatment area.

(Continued)

Table 11.1 (Continued)

			Advisory: a) Rooms should be laid out in similar configuration. b) Access should be provided at the left side of the stretcher. c) Medical gases, as required by the room function, should be considered. d) Sufficient space should be provided for up to four or five people (i.e., providers, patient, family) in the exam/ treatment room at a time. e) A consultation table and chairs should be provided for three people with a flat screen computer. f) Additional supports, including a warming cabinet, nourishment station, medication cabinet, procedure carts, clinical scale, linen hamper, mobile lights, patient washrooms, clean supply, and soiled utility rooms should be convenient to the overall treatment area. g) Storage for staff-accessible patient supplies should be provided in the room. h) Counter- and wall-mounted cupboards for storage of supplies and linen should be provided. i) Each room should contain work counter(s); cabinets; supply storage facilities; examination lights; a desk, counter, or shelf space for writing; and a vision panel adjacent to and/or in the door. j) The door may be sliding glass with provisions for privacy. k) For telehealth, attention should be paid to room colour, lighting, acoustics, and the placement of microphones, cameras, and monitors. l) TV/media for viewing of educational material may be provided. m) If required for consultation only, the examination table and chairs may be replaced with soft furniture. n) Dimmable light should be considered. o) Furniture in the room should be easily movable to accommodate a wheelchair. p) Based on program needs, a computer may be provided.
14b	Procedure/ treatment room		**Mandatory:** All requirements for an examination room (Item 14a) plus the following shall apply: a) Medical gases including oxygen and medical vacuum shall be provided as specified in CSA Z7396.1. b) A room for minor procedures shall have the dimensions shown, and access and clearance shall also be provided to two sides and the foot of the patient. **Advisory:** In addition to the recommendations for an examination room in Item 14a, the following should be considered: Other medical gases as required by the room function should be considered.
	Minor procedure room	14.0 16.5 for 3-sided access 23.0 for 4-sided access	
	Treatment cubicle, open (chair)	7.5	
	Teatment cubicle, open (bed-stretcher)	9.5	
	Exam/ treatment cubicle, enclosed (chair)	8.5	

(Continued)

Table 11.1 (Continued)

	Treatment cubicle, enclosed (bed-stretcher)	13	
	Treatment (partial walls on 3 sides)	11.0	
14c	Examination/ procedure/ treatment Bariatric	16.0	**Requirements in addition to those in Items 14a (and 14b if it is a treatment space)** a) Consideration shall be made for including exam rooms that have been designed specifically to accommodate a bariatric patient. b) The minimum clear opening of all doorways for spaces that provide bariatric access shall be 1220 mm. c) Doorways shall have a level wheeled mobility device maneuvering space on both sides of a door as specified in Clause 7.8.8.1.4 d) Equipment and furniture (including, in particular, the exam table) shall be provided to accommodate a bariatric patient and to suit the function of the room. e) Where renovation work is undertaken, every effort shall be made to meet these minimum standards. In such cases, each room shall have a minimum clear area of 12.0 m^2, exclusive of fixed or wall-mounted cabinets and built-in shelves. f) For special purpose examination rooms used primarily for bariatric patients i) the room arrangement shall permit a minimum clearance of 1220 mm at each side and at the foot of the examination table, bed, or chair. Minimum clearance around the treatment chair shall be 1220 mm; and ii) space to transfer a bariatric patient from a bariatric stretcher shall be provided. **Advisory:** Recommendations are in addition to those in Item 14a (and Item 14b if it is a treatment/procedure room). a) For an open examination, the treatment area is used primarily for bariatric patients. Adjustments could be required to clearances and room layout to accommodate devices used for bariatric patients. b) To provide access for bariatric patients with larger wheelchairs or assistive devices, a clear area should be provided inside each room. The clear area shall measure no less than 2440 mm wide and 1830 mm deep (8 ft-0 in wide x 6 ft-0 in deep).

(Continued)

Table 11.1 (Continued)

15	Examination/ treatment room —Isolation		**Mandatory:** The following requirements shall apply in examination/ treatment rooms intended for patients requiring airborne precautions, in addition to those specified in the examination/ procedure/treatment (EPT) room described in Item 14. a) A clean area shall be prepared for staff to put on PPE before entering the procedure room. b) A contained soiled area shall be provided outside the procedure room for staff to wash up and remove PPE before entering a public corridor. c) AIRs in the emergency department shall be equipped with an adjacent two-piece washroom directly accessible from within the exam room. d) At least one of the AIRs in the emergency care shall be equipped with a ceiling-mounted patient lift track. e) Layout and service requirements shall conform to current infection prevention and control guidelines. f) An alcove for wheelchair/scooter access shall be provided nearby. g) An alcove shall be provided outside the room for PPE and a hand sink. h) A hand hygiene sink shall be provided for staff and patient use. i) The means used to provide patient privacy shall allow for terminal cleaning between patients when needed (e.g., between-glass blinds). **Advisory:** For AIRs in ambulatory care, consideration should be made for adding a two-piece washroom (4.6 m^2), two-piece accessible washroom (5.6 m^2), or a three-piece washroom (7.0 m^2) adjacent to the exam room. If provided, the washroom shall be directly accessible from the within the exam/treatment room. It shall be for the exclusive use of the isolation exam/treatment room.
	Exam room	13.0	
	Anteroom	5.0	
	Prep alcove	2.0	

(Continued)

Table 11.1 (Continued)

16	Examination/ treatment — Adjacent washroom	13.0 4.6 to 5.6 (2- or 3-piece washroom) 1.4 (prep)	**Mandatory:** The following requirements shall apply, in addition to the EPT room described in Item 14: a) This room type shall be provided for gynaecological exams and also for patients suspected of having non-airborne infections. b) A clean area for staff to put on PPE before entering the examination/treatment room shall be provided, and may be shared by up to four rooms provided the distance to the room is not more than 3600 mm. **Advisory:** a) As specified in Item 14. b) If the room could be used for gynaecological exams, the room layout should have the foot of the patient stretcher oriented away from the door. c) Consideration should be given to accommodating other needs (e.g. two-piece bariatric washroom [5.6 m^2]). d) A preparation/supply alcove may be included outside exam rooms. e) Alcoves may be shared (by up to four rooms), 1.4 m^2.

(Continued)

Table 11.1 (Continued)

17	Examination/ safe room	13.0	**Mandatory:** The following requirements shall apply, in addition to the EPT room described in Item 14: a) Mental health safety and risk mitigation guidelines shall be applied, especially as follows: i) vertical projections and corners that could cause self-harm shall be avoided; ii) all horizontal projections that could allow climbing or cause self-harm shall be avoided; and iii) a flush protective glazing panel shall be provided at the window (if present). b) Direct access from triage shall be provided, with good access for emergency medical staff. c) Adjacency to the emergency entrance shall be avoided. d) Storage shall be provided nearby for restraints (restraint use will depend on HCF policies and patient disorders). e) A patient washroom shall be provided nearby. f) Convenient access to a staff hand hygiene sink shall be provided, as determined by an ICRA. g) An exterior window is not required, except if the room is to be used for more than 24 h stays. h) The door shall be wide enough to allow entry for a restraint bed (minimum 1100 mm, preferably 1200 mm). i) Multi-point door locking with automatic locking function when closed, shall be provided. j) The stretcher position in the room shall be located to optimize patient privacy. k) Acoustic separation from other emergency areas shall be provided. l) Examination lighting shall be provided, along with general lighting, with level control by staff from outside the room, to provide a quiet mood. m) Temperature control by staff outside the room shall be provided. n) Special finishes shall be provided as follows: i) they shall be easy to maintain and repair without generating toxic fumes, in order to minimize downtime of rooms; and ii) floor and wall finishes shall be washable. o) A stretcher with restraint capability and locking wheels shall be provided. p) Medical gases shall be provided if the room is to serve as an exam room, and shall be located within a securable, tamper-resistant cabinet. **Advisory:** a) A second exit door should be considered. b) Finishes should be sound absorptive, tamper-resistant, and cleanable.

(Continued)

Table 11.1 (Continued)

18	Gym	Varies by program; assume not less than 46.5	**Mandatory:** a) The mandatory and advisory guidelines of the treatment table/therapy equipment shall be accommodated, as well as all related circulation space. b) Double doors shall be provided into the gym. c) For parallel bars, there shall be wheelchair access, with turning radius at both ends, and space for two caregivers on any side at any one time. Allowance shall be made for a ceiling-mounted support system for bariatric patients. d) Training stairs shall have access on both sides, a wheelchair turning space at the bottom, and proper head clearance at the top. e) Space shall be provided near equipment for temporary wheelchair storage. f) The exerciser (for lower/upper extremities) shall have accessibility on both sides, wall pulleys, an accessible high-low table, and leg press side-access. g) The treadmill shall be accessible at one end. h) Hand hygiene sinks shall be provided. i) Open space for gait and mobility training shall be provided. A minimum 30 m pathway and a minimum 15% of the gym area shall be maintained as clear space. **Advisory:** a) The equipment and therapy program inventory should be considered to establish parameters and the number and extent/type of equipment required. b) Medical gases are assumed to be portable, but built-in could be considered based on program need. c) Allowance should be made for either a free-standing or wall-mounted universal weight station, with wheelchair accessibility ensured. d) Impact-absorbent flooring should be considered.

(Continued)

Table 11.1 (Continued)

19	Hand hygiene sink	1.0	**Mandatory:** Hand hygiene sinks shall be constructed and installed as follows: a) Materials— i) Materials shall be non-porous, e.g., porcelain, enamel, vitreous china, or 18 gauge (or thicker) stainless steel. ii) Granite or marble shall not be used. b) Size— i) Hand hygiene sink size shall be sufficient to prevent recontamination (from splashing) during use. The minimum inside dimension should be 350 × 250 mm, with a minimum depth of 225 mm. Non-clinical sinks (i.e., vanity sinks, sinks in staff lounges, change/ locker rooms, kitchens, housekeeping rooms, public areas) may be smaller if deemed appropriate by the IDT based on a risk assessment with input from infection prevention and control. The fundamental characteristics of sink construction as laid out in Item c) below shall be followed (i.e., shape of sink, off-set sink and spout, etc.) to prevent splashing. The establishment of mock-ups should be considered to ensure the suitability of selected sinks. ii) Cup or bar sinks shall not be used for hand hygiene. **Note:** *Common requirements for the minimum depth of hand hygiene sinks range from 190 to 225 mm.* c) Construction— i) Hand hygiene sinks shall be shaped to prevent splashing and with a collar directing runoff into the sink basin. ii) The sink shall not be capable of taking a sink plug. iii) The sink and spout shall be designed such that splashing and aerosolization are minimized. The spout shall not direct water directly into the drain, but should hit the basin surface in front of the drain. iv) Spouts shall be free of aerators\modulators\rose sprays and shall not swivel. v) Strainers and anti-splash fittings at outlets shall not be used. **Note:** *These can easily become contaminated with bacteria.* vi) The outside rim shall be of minimal width and have the surface angled down towards the inside to prevent pooling of water and placement of objects on the rim. vii) Traps shall be metal. Gaskets at the skin/drain connection shall be plastic or neoprene. Rubber gaskets shall not be used. viii) Trap size shall be 40 mm diameter. **Note:** *Trap size relates to drainage time and water flow time.* ix) Overflows shall not be used.

(Continued)

Table 11.1 (Continued)

Note: *Overflows are difficult to clean and become contaminated very quickly, serving as reservoirs of bacteria.*

x) Adequate drainage flow rate shall be provided to ensure the removal of soap residue.

Note: *The effectiveness of rinsing is a function of the flow rate, the pressure, and time.*

xi) Eyewash stations shall not be attached to hand hygiene sinks.

d) Location—
   i) Sinks shall be wall-mounted with the edge of the sink at least 1 m away from any fixed work surface or separated by a splash barrier. Sinks shall not be inserted into or immediately adjacent to a counter.
   ii) The top rim of hand hygiene sinks shall be installed at least 865 mm above the floor and shall not have storage underneath (due to proximity to sanitary sewer connections and risk of leaks or water damage).
e) Controls—
   i) Taps and controllers shall be hands free. Electric eye, foot pedal, or faucet blade controls (minimum 150 mm blades) may be used. Electric eye operation shall be triggered by hand, not body, placement. A means shall be provided to control the temperature.
   ii) Automatic temperature control that is tied to the building automation system shall not be used. Temperature shall be manually set on individual mixing valves.
   iii) Electric eye technology shall have a backup that allows for operation during power interruptions and shall have a means for users to adjust water temperature adjacent to the sink.
f) Backsplash—
   i) Adjacent wall surfaces shall be protected from splashes with impermeable back/side splashes. Backsplashes need not be integral with the sink itself, but can be add-on accessories. Backsplashes shall be seam free. All edges shall be sealed with a waterproof barrier. Backsplashes shall include the area under the paper towel dispenser and soap dispenser.
   ii) Backsplashes shall extend a minimum 600 mm above sink level and shall extend to meet the cove base below.
g) Soap and lotion dispensers—
   i) Soap and lotion dispensers shall have hands free operation and be mounted to permit unobstructed access and minimize splashing or dripping onto adjacent wall and floor surfaces.
   ii) Dispensers (soap or lotion) shall use non-refillable bottles and shall be placed to prevent splash-up contamination.
   iii) Soap, lotion and hand sanitizer dispenser locations shall be physically separated to prevent confusion of products. Thought should be given to the strategic location of lotion dispensers away from direct patient-care areas (i.e. staff lounge) to prevent cross-contamination.

(Continued)

Table 11.1 (Continued)

The following shall apply for hand drying:

a) Single-use paper towels shall be provided. Cloth drying towels or electronic air driers shall not be used. Hot air dryers should not be used in patient care areas or in staff or visitor washrooms.

Note: *Paper hand-towels dry hands rapidly and dispensers can be used by several people at once. They are considered to be the lowest risk of cross-infection and are the preferred option in clinical practice areas. The World Health Organization recommends drying hands with single-use paper towels and does not recommend electric air dryers due to length of time to dry and risk of aerosolization.*

b) Air hand driers may be permitted in strictly public washrooms outside of patient-care areas (i.e., main lobbies, food court areas). Consideration should be given to the design/layout of the washroom space related to access/egress as well as location of drier(s) to minimize contamination issues. Drier selection should support the area where the unit is installed (i.e., high velocity verses low velocity) and, whatever system is chosen, the materials and finishes of the washroom shall take into account potential water contamination from dispersal of water droplets.

c) Towel dispensers shall be mounted to permit unobstructed access and minimize splashing or dripping onto adjacent wall and floor surfaces.

d) Towel dispenser design shall be such that towels are dispensed singly. They shall either be hands-free or designed so that only the towel is touched during removal of towel for use.

e) Hot-air dryers shall not be used for hand hygiene sinks.

f) Paper waste receptacles shall be made of a corrosion free material and be a wide-mouth design.

g) Space shall be allowed for the placement of waste bins in close proximity to the hand hygiene sinks.

h) To avoid recontamination of the hands, paper towels should be available to use on the exit door hardware and a trash container for used towels should be located near the exit door.

i) Bins, with a waste bag, shall be provided in close proximity to each hand hygiene sink. If bins are lidded, the bin shall be foot-pedal operated.

Accessible sinks:

a) Hand hygiene sinks shall be located at a level where they can used by people in wheelchairs and shall be available as per HCF requirements. These are in addition to hand hygiene sinks used by staff.

b) Hand hygiene sinks should be in accordance with ASME A112.19.2/CSA B45.1 and CSA B651.

(Continued)

Table 11.1 (Continued)

20	Waterless hand hygiene station (alcohol-based or other waterless hand hygiene dispenser)	N/A	**Mandatory:** Hand hygiene stations shall be installed at the point of care to improve adherence to infection prevention and control principles. **Advisory:** a) Stations should be installed outside inpatient bedrooms at the entrance. b) Stations should also be installed at the bedside.
21	Housekeeping closet	7.0	**Note:** *The sizes and requirements for this room are based on the assumption that major equipment is stored elsewhere.* **Mandatory:** a) A housekeeping closet shall be provided in all major care areas or a minimum of one closet per 650 m^2. b) Every housekeeping room shall have a floor-based sink with a minimum inside dimension of 600 mm × 600 mm. This sink shall be protected by an easily cleanable wall surface up to 1200 mm from the finished floor. c) The housekeeping room shall be large enough to store at least one housekeeping cart. d) Wall protection shall be provided to prevent damage by the carts to a height of 1200 mm. e) The room shall include i) a floor sink for dumping of dirty water from pails, etc.; ii) a fresh water source (hot and cold) for filling pails, etc.; iii) a hand hygiene sink with paper towel dispenser and waste container; iv) a non-fixed shelving unit for storage of supplies (i.e., paper towels, toilet paper); and v) fixed shelving for storage of small quantities of cleaning products. f) The room shall be secure with access restricted to clinical and support staff.
22	Housekeeping service room	11.0 minimum, based on equipment and service delivery model	**Note:** *The sizes and requirements for this room are based on the assumption that major equipment is stored in the service area.*

(Continued)

Table 11.1 (Continued)

			Mandatory: a) A housekeeping service room shall be centrally located between care areas and shall be able to accommodate large power equipment and have greater inventory for distribution to the smaller housekeeping unit rooms. b) The room shall accommodate the following functions: i) necessary electrical service for battery recharging; **Note:** *If multiple charging stations are in one location, additional ventilation could be needed.* ii) space for cleaning products (and dispensers, if used); and iii) an eyewash station with tempered water supply and floor drain to collect run-off. **Note:** *Consideration should be given to the need for a water source if dispensers are used.* c) The room shall be secure with access restricted to clinical and support staff.
23	Hydrotherapy area	Varies according to HCF size and delivery model.	**Mandatory:** a) Patient lifts shall be provided for transfer of patients. b) Each space shall be curtained off for privacy. c) Counters shall be provided as work and storage areas, with upper wall cabinets. d) Floors and walls shall be of water-resistant material. e) A floor drain shall be provided. f) The room shall be secure with access restricted to clinical and support staff. g) The room shall have a nurse call system. h) The floor shall be finished with slip-resistant materials.

(Continued)

Table 11.1 (Continued)

24a	Inpatient bedroom	1-bed room suite	**Mandatory:** Inpatient bedrooms shall be designed with the following features: a) Area—Inpatient bedrooms shall be constructed to meet the needs of the functional program and have a minimum of 16.0 m² of clear floor area in single-bed rooms, exclusive of toilet rooms, closets, lockers, wardrobes, alcoves, or vestibules. b) Renovation—Where renovation work is undertaken, every effort shall be made to meet the above minimum standards. If it is not possible to meet the above requirements, inpatient bedrooms shall have not less than 12.0 m² of clear floor area in single-bed rooms exclusive of the spaces previously noted in this section.
	Bed area	15.0	
	Washroom	5.6 3-pce (with shower stall)	
	Vestibule	5.0	
	Family zone	Included in bed area	
	Staff zone	Included in bed area	
	Supply alcove	1.4	
	Two-bed room (if allowed as per Clause 7.5.2.2)		
	Bed area	26.0 (13.0 per bed)	
	Washroom	11.2 (5.6 per washroom)	
	Vestibule	7.0	
	Family zone	included in bed area	
	Staff zone	included in bed area	
	Supply alcove	1.4	
	Other considerations:		
	Two washrooms, 3 piece (traditional with bath/shower)	14.0	
	Two washrooms – 3-piece with shower	11.2	
	Two washrooms, 3 piece (hand-held)	9.2	

(Continued)

Table 11.1 (Continued)

Note: *If it is not possible to meet this requirement, the authorities having jurisdiction can be asked for approval to deviate from this requirement.*

c) There shall be sufficient space for bed, equipment including monitors, ventilator, supply cart, furnishings (i.e., side chairs, recliner chair, over bed table), staff and visitors, and mobile charting station (in the event the room is used for step-down/high-dependency care for patients transitioning from the critical care unit).

d) The bed area shall have a minimum clear dimension of 4000 mm × 4000 mm, including a minimum clear dimension of 1800 mm for wheelchair turning and stretcher access between the bed and the inside wall (staff side), a minimum clear dimension of 1100 mm between the bed and the wall on the opposite side (family side), and a minimum of 1500 mm from the foot of the bed to the facing wall.

e) The minimum distances around and between beds shall be in accordance with Table 7.1.

f) Staff shall be able to access all sides of the patient bed.

g) Rooms for bariatric patient use shall have the necessary additional space and equipment for safe, efficient, and effective management of bariatric patients. See Clause 7.4.4.

h) The family side of the bed shall contain a wardrobe unit with minimum dimensions of 450 mm × 600 mm and space for a recliner/pull-out bed or a window seat.

i) Flooring shall comply with Clauses 7.2.2.4 and 12.2.5.2.

j) A storage space (alcove, recess, or cabinet) for personal protection equipment shall be located in a corridor alcove outside the room, and shall not obstruct the corridor.

k) A soiled linen hamper and waste container shall be provided.

l) A hand hygiene station shall be located in the corridor outside each bedroom and at the point of care in each bed area.

m) Hand hygiene facilities shall be in accordance with Clause 7.5.11 and Item 19 of this Table.

n) There shall be a private washroom accessible from within the patient bed area. The washroom shall comply with the requirements in Table 11.1, Item 25.

o) Provision of a patient lift shall be in accordance with Clause 7.6.6.2.

p) Specialized water/drain services for portable dialysis equipment shall be provided accordance with the functional plan.

q) There shall be storage for patient personal belongings. In a pediatric inpatient unit, space should be provided for storage of family personal belongings. This storage should be lockable.

r) Medical gases (oxygen, medical vacuum, and medical air) shall be provided in accordance with CSA Z7396.1.

s) Each bed shall have access to daylight. The amount of daylight shall be controllable.

(Continued)

Table 11.1 (Continued)

t) All lights shall be on separate switches.
u) Bed lights shall be provided and shall be controllable by the patient.
v) There shall be a wall or ceiling-mounted clock.
w) There shall be a telephone for patient use.
x) Individual temperature control shall be provided.

Note: *See CAN/CSA-Z317.2.*

y) Sharp corners shall be avoided.
z) Cubicle curtains and draperies shall be non-combustible or rendered flame retardant and shall pass both the large and small scale tests in NFPA 701. Cubicle curtains should be washable at a temperature that provides thermal disinfection.

Note: *Washable blinds on windows are preferable to curtains as they retain less dust and are easier to clean.*

aa) Bedrooms in selected inpatient areas shall have the capability for non-invasive monitoring, such as telemetry, and sufficient space shall be provided at the appropriate communication station to accommodate the additional monitoring equipment.
ab) A nurse call system shall be easily accessible (audibly and physically) from the bed.
ac) The room design shall be based on minimum overall bed dimensions (bumper to bumper) of 2250 mm long × 1050 mm wide, unless it is known that a larger bed will be used.
ad) Storage shall be provided for a clean bedpan either in the patient washroom or in a discreet location in the bedroom.
ae) Allowance shall be made for future accommodation of wireless/multi-faceted TV/communication/laptop, etc. as portable devices at the bedside.
af) A puncture-resistant sharps container shall be available at point of use.
ag) Safe, accessible electrical receptacles shall be provided.

Note: *Minor encroachments, including columns and hand hygiene sinks (as required) that do not interfere with functions, may be ignored when determining space requirements. Bed dimensions become a critical consideration in determining final room sizes.*

Mandatory for a 2-bed room, if allowed as per Clause 7.5.2.2:

a) The need to pass through another patient's bed space to access the washroom or window shall be avoided.
b) A privacy curtain shall be incorporated in all shared bedrooms.
c) There shall be side-to-side visual privacy between patients.
d) A washroom shall be provided for each occupant and assigned to that occupant; a 2-bed room shall have two separate and distinct washrooms.

(Continued)

Table 11.1 (Continued)

Advisory:

a) An alternative washroom configuration may be planned (in lieu of the 3-piece washroom with shower stall). Washroom options and sizes are as follows:
   i) 3-piece washroom - traditional (sink, toilet and tub with shower) — 7.0 m^2;
   ii) 3-piece washroom with hand-held wand — 4.6 m^2; and
   iii) 2-piece washroom — 4.6 m^2.

b) In addition to the required access to one side of the toilet, space for staff to assist should be provided on the opposite side.

   Note: *A side approach to a toilet could pose a risk if the toilet has fold-down side grab bars. In that case a direct front-on approach to the toilet should be used.*

c) The height of the windowsill should be as low as permissible by code in order to provide the maximum view from the patient bed.

d) Wall protection should be considered, especially at the head of the bed.

e) It should be possible to view the patient's head from the entrance door.

f) Wardrobes, if moveable rather than built-in, should be fixed to the wall for safety.

g) Horizontal and vertical clearance should be provided at the bedroom door for traction equipment.

h) A fold-down surface for documentation/charting should be provided on the staff area side of the bed.

i) There should be sufficient space for equipment, including monitor, ventilator, supply cart, and mobile staff charting station in the event the room is used for step-down/high-dependency care for patients transitioning from the critical care unit).

j) Each bed should have a landscape view.

k) Multiple safe, accessible electrical receptacles should be provided.

(Continued)

Table 11.1 (Continued)

24b	Inpatient bedroom - Bariatric	**Note:** *Consideration should be made for creating an inpatient bedroom with the capacity for a bariatric patient.* **Mandatory:** a) Rooms for bariatric patient use shall have the necessary additional space and equipment for safe, efficient, and effective management of bariatric patients. See Clause 7.8.8.1.3. b) The room shall provide a clear area of at least 25.0 m², exclusive of the washroom and closet/locker. c) The entry door opening shall be at least 1500 mm wide. **Notes:** 1) *The entry doorway may include a second panel to provide this opening width.* 2) *The use of sliding glass doors (with privacy curtain inside room) should be considered.* d) Clear space of at least 1500 mm shall be provided on three sides of the bed. e) The minimum clear opening of all doorways for spaces that provide bariatric access shall be 1220 mm (4 ft-0 in). f) Doorways shall have a level wheeled mobility device maneuvering floor space on both sides of a door as specified in Clause 7.8.8.1.4. g) The bed area in a room designed for bariatric use shall have a minimum clear dimension of 4000 mm x 4000 mm, including a minimum clear dimension of 2440 mm for wheelchair turning and stretcher access between the bed and the inside wall (staff side), a minimum clear dimension of 1500 mm between the bed and the wall on the opposite side (family side), and a minimum of 1725 mm from the foot of the bed to the facing wall. h) The minimum distances around and between beds shall be in accordance with Table 7.1. i) The family side of the bed in a room designed for bariatric use shall contain a space for a recliner/pull-out bed, or a window seat with minimum dimensions of 600 mm x 1220 mm. j) The room design of a room designed for bariatric use shall be based on minimum overall bed dimensions (bumper to bumper) of 2250 mm long x 1220 mm wide, unless it is known that a larger bed will be used. k) Service connections (e.g., medical gas, electrical) shall be spaced farther apart to accommodate a wider bed. l) The bed shall be able to accommodate a 453 kg patient.

(Continued)

Table 11.1 (Continued)

Note: *Beds for bariatric patients are longer and wider than a standard bed — usually not less than 2285 mm long (2490 mm extended) x 1118 mm wide (1574 mm with side rails).*

m) The room shall be equipped with handrails that can support at least 453 kg.

n) The room shall have a ceiling-mounted patient lift and transport at least 453 kg. The track should extend to both sides of the bed, and from the bed to the washroom. This requirement does not apply to mental health units. If a ceiling lift is not installed, storage space and a suitable power supply shall be provided for a portable lift and a portable or ceiling lift shall be readily available for use in the room.

o) Safe, accessible electrical receptacles shall be provided.

Advisory:

a) To provide access for bariatric patients with larger wheelchairs or assistive devices, a clear area should be provided inside each room. The clear area shall measure no less than 2440 mm wide and 1830 mm deep (8 ft-0 in wide x 6 ft-0 in deep)

b) There should be a privacy curtain at the entry door.

c) Patient control of room lights, temperature, and TV from bed should be provided.

d) A fan with a patient-operated control should be provided.

Note: *Bariatric patients are more likely to feel warm or hot.*

e) A weigh scale integrated into the bed should be provided.

f) A portable lift should be provided with a capacity of 453 kg to use in areas not reached by ceiling mounted lift, in cases where the patient falls outside of ceiling lift range (i.e., corridor).

g) Water and drain connections for a portable dialysis machine should be provided.

Note: *The need for these connections should be determined based on the functional program.*

(Continued)

Table 11.1 (Continued)

25a	Inpatient washroom	Individual washroom:	**Mandatory:** a) Each bedroom shall have direct access to a washroom. b) Privacy shall be allowed, while also including a door that is easily accessible by staff if necessary. c) There shall be sufficient space for a 1500 mm wheelchair turning radius. In rooms for bariatric patients, there shall be an 1800 mm turning radius. d) The washroom shall be accessible and contain a toilet with appropriate grab bars, a sink, and a shower with grab bars and fold-down seat. e) The toilet shall be capable of supporting 250 kg. f) The toilet centre line to wall shall be in accordance with applicable requirements. **Note:** *Refer to building codes.* g) There shall be grab bars behind and beside the toilet. h) Toilets with tanks shall not be used, due to the risk of condensation. i) Accessibility shall be provided for patients and staff on both sides of the toilet. j) There shall be clear space on one side of toilet of at least 1100 mm for transfer use. k) The grab bars shall be able to withstand 250 kg downward force. l) The grab bars shall meet accessibility standards. **Note:** *See CSA B651.* m) The shower area shall be open to the toilet area and a minimum dimension of 1200 mm × 1500 mm. n) Showers shall have no floor lip, but the entire room shall be sloped to a drain. o) Seating shall be provided in the shower area. p) The shower shall have a handheld spray nozzle on the side wall and a movable/portable shower seat.
	Single accessible	4.6	
	Patient, 2 piece	4.6	
	Patient, 2 piece (bariatric)	5.6	
	Patient, 3 piece (with hand-held shower)	4.6	
	Patient, 3 piece with shower (med/surg unit)	5.6	
	Patient, 3 piece (traditional – tub/ shower)	7.0	

(Continued)

Table 11.1 (Continued)

			Note: *Portable seats should be used, as wall-mounted seats can have less load tolerance.* q) The washroom sink shall be able to withstand 250 kg downward force (patients could lean on sink for support). r) An accessible counter shall be provided at the washroom sink. s) A dry area shall be provided for towels/clothing. t) Shelving shall be provided above the counter and beside the mirror. u) Sink handles shall be positioned for maximum accessibility. v) The door shall be a minimum 1050 mm. w) Controls and other hardware shall be easy to use by patients with varying physical ability levels. x) Readily accessible nurse call system shall be provided, to be shut off only at source. y) The room shall include, or have convenient access to, separate waste disposal equipment for patient waste. The toilet in a patient washroom shall not be used to dispose of waste from a bedpan, etc. See Clause 7.5.7. z) Provisions shall be made at the washroom sink location for placement of the patient's personal items. aa) Clean bedpan storage shall be provided either at the bedside or in the washroom. ab) The washroom floor shall have non-slip finish with an integral cove base. Flooring shall comply with Clauses 7.2.2.4 and 12.2.5.2. **Advisory:** a) Consideration should be given to the location of grab-bars to facilitate self-enablement (at the sink, for example) as well as facilitate assistance. b) The distance from bed to washroom should be minimized. c) Hollow-core doors should be used to facilitate movement. d) Sensory lighting adjustable for brightness should be provided. e) Providing a heat lamp in the shower area should be considered. f) A clean storage area for a patient wash basin should be provided either at the bedside or in the washroom. g) A grab bar should be provided to help patients to stand at an accessible sink. h) The toilet paper dispenser should be mounted at an extended placement in front of toilet to allow easy access by patients. i) Shelving should be provided above the toilet to accommodate a bedpan and urine bottle.
25b	Inpatient washroom - bariatric	7.0	**Note:** *Consideration should be given to creating a washroom designed specifically to accommodate a bariatric patient, family member, visitor, or staff member.*

(Continued)

Table 11.1 (Continued)

Mandatory:

a) The minimum clear opening of all doorways for spaces that provide bariatric access shall be 1500 mm.
b) Doorways shall have a level wheeled mobility device maneuvering space on both sides of a door as specified in Clause 7.8.8.1.4.
c) To provide access for bariatric patients with larger wheelchairs or assistive devices, a clear area should be provided inside each room. The clear area shall measure no less than 2440 mm wide and 1830 mm deep (8 ft-0 in wide x 6 ft-0 in deep).
d) Rooms for bariatric patient use shall have the necessary additional space and equipment for safe, efficient, and effective management of bariatric patients. See Clause 7.4.4.
e) There shall be sufficient space for a 1800 mm wheelchair turning radius to accommodate mobility devices used by bariatric patients.
f) The washroom shall contain a bariatric toilet with appropriate grab bars, a sink, and a shower with grab bars and fold-down seat.
g) The bariatric toilet shall be capable of supporting 453 kg (1000 lb).
h) The toilet centre line to wall shall be in accordance with applicable jurisdictional requirements for bariatric fixtures (refer to building codes).
i) There shall be clear space on each side of toilet to accommodate a staff member on each side of the patient. A clear space shall be provided on one side of at least 1500 mm for transfer use.
j) Wall-mounted toilets shall not be used. Floor-mounted toilets will provide the appropriate bariatric capacity.
k) There shall be two drop-down grab bars. Bariatric grab bars shall be able to withstand 453 kg (1000 lb) downward force and shall meet accessibility standards. See CSA B651.
l) The shower area shall be open to the toilet area and have a minimum dimension of 1500 mm x 1800 mm.
m) The bariatric washroom sink shall be able to withstand 453 kg (1000 lb) downward force (patients could lean on sink for support).

Note: *Patients sometimes lean on sinks for support.*

n) An accessible counter shall be provided at the washroom sink.
o) The door shall be a minimum of 1220 mm (4 ft-0 in)

Controls and other hardware shall be easy to use by patients with varying physical ability levels and shall be selected specifically for bariatric patients.

(Continued)

Table 11.1 (Continued)

26	Isolation room suite, private, AIR	1 bedroom suite, AIR isolation	**Mandatory:** In addition to the inpatient bedroom requirements (Item 24), the following shall apply: a) Each inpatient AIR isolation suite shall have a single anteroom, to be used for access and egress for staff while caring for patients that require airborne precautions.
	Bed area	16.2	
	Washroom	7.5 (5.6 if shower stall is supplied instead of bath)	
	Anteroom	7.5	
	Family zone	3.0	
	Staff zone	3.0	
	Supply alcove	1.4	

(Continued)

Table 11.1 (Continued)

Note: *A second entry space to separate access from egress should not be provided.*

b) Self-closing doors shall be used for all AIR as well as for anterooms.
c) Glazed panels shall be provided in the anteroom doors and side panels to ensure visibility of the patient.
d) A washroom (including shower or tub) that complies with the requirements of Clause 11 shall be accessible directly from the bed area. For AIRs in critical care, see Table 8.2.
e) There shall be a hand hygiene sink in the bed area and in the anteroom in full view of staff, patients, and visitors accessing the space.
f) Clearances around and between beds shall be in accordance with Table 7.1.
g) A soiled linen hamper and waste container shall be located within the anteroom.
h) Enclosed patient waste disposal units shall be readily accessible from every inpatient bedroom.
i) Monitoring devices and alarms shall be outside each room to monitor pressure differential. These shall be available so that the rooms can be monitored on admission and daily while occupied by those requiring airborne precautions. Measurements shall be taken between the corridor and the inpatient bedroom and the anteroom.
j) Systems shall be in place to monitor air supply and exhaust system function. These systems shall be connected to the building automation system with alarms to notify the plant engineers of any problems with the systems.
k) The AIR shall be constructed to minimize air leakage into the space. The room shall be well sealed by ensuring walls, windows, ceilings, and penetrations into the space (e.g., electrical, plumbing) are sealed properly. Walls shall extend to the underside of the slab and be fully sealed.
l) Shared anterooms between AIRs shall not be permitted. AIRs should not be located immediately adjacent to one another, as this could make it more difficult to maintain the required pressures. If AIRs are located immediately adjacent to one another the intermediate wall shall be inspected and tested for leakage during construction.
m) A gap of 6 mm to 12 mm shall be left under the door to allow for airflow into the room.
n) Air flow, circulation, filtering, pressure differentials, exhaust systems, and alarms shall be in accordance with CAN/CSA-Z317.2.
o) Windows shall be positioned to allow visibility of the patient from the corridor.
p) The room design shall allow easy access and maintenance to mechanical systems.

(Continued)

Table 11.1 (Continued)

			Note: *See CSA Z317.1 and CAN/CSA-Z317.2.* q) AIRs for pediatric or adolescent patients shall also comply with the requirements of Clause 8.5, including space for families. r) Minimum distances around the bed shall be in accordance with Table 7.1. **Advisory:** a) Doors that provide direct access from the corridor to the room may be used where transport of the patient through the anteroom is not practical. A preferred solution is a wider door or a fixed leaf arrangement. b) A three-piece washroom may be planned (in lieu of the two-piece). A three-piece washroom with shower stall should be 5.6 m^2.
27	Imaging/ equipment alcove	Varies by program, equipment requirements and delivery model	**Mandatory:** For mobile C-arms and mobile X-rays the following shall apply: a) Equipment shall not be stored in operating rooms. b) Space for lead (Pb) apron rack(s) on wheels shall be provided (at least 1200 mm × 900 mm).
28	Laundry for inpatient continuing care and for rehabilitation care (ADL laundry)	Minimum 11.0, varies by program and equipment requirements	**Mandatory:** a) The laundry shall be wheelchair accessible. b) The laundry shall reflect similar challenges of the home as part of the transition. c) Doors shall be a minimum 1050 mm or 860 mm with a 600 mm door leaf. d) Provision shall be made for a washer and dryer in an ADL apartment as well, but only as a secondary if an ADL laundry room is provided elsewhere. e) Space shall be provided for folding and hang drying. f) Flexibility shall be provided to allow for task lighting. g) A family/visitor space to assist the patient shall be accommodated. h) A nurse call system shall be provided. **Advisory:** a) As an easily adaptable item in transition to the home, using contrasting colours of different planes and furniture for ease of orientation should be considered. b) Combining the ADL laundry and kitchen in one area should be considered. c) Consideration should be given to whether, based on program requirements, a full ADL apartment is required or only a laundry and kitchen.

(Continued)

Table 11.1 (Continued)

29	Lounge, patient/ visitor — General	2.5 per occupant (including circulation)	**Mandatory:** a) A lounge shall be in the inpatient unit. b) Visibility of activities from a staff care desk or other staff location shall be provided. Camera observation is optional, but less desirable than a direct view. c) Natural light and a view of the outdoors shall be provided. d) Separate areas shall be provided to isolate quiet and noisy activities; separate rooms should be provided. e) Adequate storage space shall be provided for activity equipment and supplies. f) Acoustic treatment to reduce ambient noise and acoustic separation from other areas shall be provided. **Advisory:** Lounges should not be used for eating meals. If a separate quiet lounge is provided, it should be 10.0 m^2 minimum. The estimated occupant count should include family members. Electrical receptacles in addition to those in should be provided where possible for the use of those in the room (e.g., for the charging of devices.).
30	Lounge, patient/ visitor (pediatric and adolescents)	2.5 per occupant (including circulation)	**Mandatory:** a) The walls shall be of impact-resistant material and appropriate ceiling material. b) The floor shall be of resilient material complying with Clauses 7.2.2.4, and 12.2.5.2. c) Space shall be provided for the storage and use of age-appropriate toys and games, with the necessary storage spaces and electrical services and provisions for the cleaning/decontamination of toys. d) A nurse call system shall be provided. e) Surfaces of play equipment shall be washable. **Advisory:** a) The lounge should be furnished with TVs and computers. b) If a separate quiet lounge is provided, it should be 10.0 m^2 minimum. c) Lounge design and signage should discourage the eating of meals in the lounge. **Note:** *Food in lounges can create hygiene problems and can also inconvenience those not eating (e.g., from odour, spills, and litter).* d) The number and distribution of electric receptacles should be appropriate to the needs of the expected population. **Note:** *Electric receptacles will be needed for charging of electronic devices, powered mobility devices, etc.*

(Continued)

Table 11.1 (Continued)

31	Medication room	Varies according to delivery model; not less than 9.5	**Mandatory:** a) A scientific refrigerator/freezer shall be provided. b) The necessary security for narcotics shall be provided. **Note:** *Requirements for handling and storage of narcotics and controlled substances are addressed in federal regulations.* c) The room shall include a mobile medication cart or an automated dispensing cabinet for all medications used on the unit (except those with specific storage, security, or safety requirements). d) Another medication cart or automated dispensing cabinet shall be used for IV admixtures. **Note:** *In many HCFs, IVs can be delivered by porters, while other medications can only be delivered by medical staff.* e) The room shall be secure with access restricted to clinical and pharmacy staff (i.e., door with access using a keypad or a lock). f) Computer workstation(s) shall be provided for clinical pharmacists. g) A hand hygiene sink shall be mounted on the wall adjacent to the door and away from medication preparation area due to risk of splashing and aerosolization. **Advisory:** a) Ease of access for staff should be considered. b) Technology for drug dispensing, to increase safety and security, should be considered.
32	Nourishment centre	Varies according to unit/ program size 10.0 (separate enclosed room) 3.0 (alcove only)	**Mandatory:** a) The room shall be equipped with a hand hygiene sink, double sink, refrigerator, and microwave to provide patients with light snacks. b) Storage cupboards with counter space shall be required. c) An ice machine (which might need a water filter) shall be provided. **Note:** *If room is being used to prepare food as a decentralized food handling area or kitchen such as a servery, a HHS and double sink is required, with requisite automatic soap dispensers.* d) If room or station is used where there is no preparation of food, but the storage and serving only of pre-packaged snacks, homemade patient food or individually wrapped snacks from the kitchen, the following shall be provided: i) HHS ii) a stainless steel utility sink (e.g., for rinsing a cup or emptying juice).

(Continued)

Table 11.1 (Continued)

33	Offices (staff) Type 1 — one desk/no meeting space Type 2 — one desk, two visitor chairs Type 3 — one desk, small meeting area Type 4 — one desk, meeting area/four chairs	 Type 1: 9.0 Type 2: 10.0 Type 3:11.0 Type 4:14.0	**Advisory:** a) The office should have an exterior view. b) All offices should be acoustically insulated for confidentiality. c) The entry door should have a vision panel with blinds. d) Office users should have a sightline to the door when seated at their workstations.
34	Outdoor space	Varies	**Mandatory:** a) If an outdoor space is provided, a safe enclosure shall be provided to prevent wandering away from the outdoor space. b) Safe mobility shall be facilitated by the selection of ground finish, lighting, and assistive devices (pavers shall be avoided in circulation areas). c) Only non-toxic plants shall be provided. d) The space shall be designed to accommodate both small and larger group activities. e) Outdoor space shall be accessible and should have the potential for year-round use. f) A communication/response system shall be included. **Advisory:** a) To enhance its use, consideration should be given to locating the outdoor space adjacent to the indoor common activity/therapy space. b) Inclines should be avoided wherever possible. c) Edges should be designed to facilitate wheelchair manoeuvrability while avoiding a tripping hazard. d) Electrical provisions for seasonal/display lighting and music should be considered. e) Year-round opportunities should be provided for sun, shade, and protection from wind, rain, and other elements.
35	Play area (pediatric or adolescents)	2.5 per occupant (excluding equipment)	**Mandatory:** a) The walls shall be of impact-resistant materials. b) The floor shall be of resilient, water-resistant material. Consideration should be given for other flooring materials in specific areas where appropriate (e.g., reading/library spaces). c) The surfaces of play equipment and materials shall be washable. **Advisory:** Exterior window(s) should be provided.

(Continued)

Table 11.1 (Continued)

36	Reception/ control desk	4.6 per workstation and additional circulation space	**Mandatory** a) The reception/control desk shall be positioned so that there is security control and staff act as an information centre and direct visitors and staff, as required, to the unit. The space shall include a workstation. **Note:** *This function could be accommodated as an independent kiosk or as part of a communication station (see Item 4).* b) The area shall be designed according to ergonomic principles. See Clause 7.6 (occupational health and safety). c) A nurse call or intercom shall be provided. d) The station shall be designed to ensure personal security for staff. **Note:** *Security can be achieved through engineering controls such as* a) *desk height; and* b) *screening (e.g., transparent partition for security or infection control).* **Advisory:** a) A counter should be provided at the back of the room for storage of paper and other procedural material. b) Depending upon the physical layout of the unit, consideration should be given to creating a secondary entry for the movement of supplies, garbage, and patients (i.e., new admission to/from procedures and tests, morgue) away from general visitors. c) All entry points should be secure and require controlled access. An intercom system between the visitor area and staff work area should be considered so that staff can interview visitors to ensure appropriate entry into the area. d) The placement of the computer should be convenient to allow for easy input, but not obstruct the visual connection between staff and the patient.

(Continued)

Table 11.1 (Continued)

37	Respiratory therapy/ anaesthesia support area	Varies according to program	**Mandatory:** a) The area shall have a hand hygiene sink. b) A hand hygiene station shall be provided inside the door. c) The room shall be used for storing of equipment (e.g., ventilators) and gas cylinder storage (i.e., emergency back-up or low usage specialized gases). d) Cleaning of equipment (e.g., ventilators), if done, shall either be performed in a separate area, or with an arrangement that provides for one-way workflow (protected from cross-contamination) within this area. The area shall include a utility sink and storage. **Note:** *See CSA Z317.1.* e) Medical gas and medical vacuum shall be provided (for testing equipment). **Advisory:** a) For the convenience of staff and doctors, this area should be centrally located in the unit if required by the program. b) The room should be flexible enough to include testing (e. g., blood gases) services. c) Medical air could be required as part of equipment testing.
38	Satellite pharmacy	Varies	**Mandatory:** a) Modular picking station(s) shall be provided. b) Space shall be provided for utility/supply carts. c) A hand washing sink and emergency eyewash shall be provided. d) The room shall have positive relative pressurization ventilation. e) Computer workstation(s) shall be provided for clinical pharmacists. f) Alarm monitoring and card control shall be provided. g) A refrigerator shall be provided. h) If sterile products are to be prepared, the design shall enable sterile preparation guidelines to be followed.

(Continued)

Table 11.1 (Continued)

39	Soiled utility room	Varies – minimum 12.0	**Mandatory:** a) Clean and soiled utility rooms shall be separate rooms. There shall be no connecting door between these rooms. b) Soiled utility rooms shall only be used for temporary storage or supplies and equipment that will be removed for cleaning, reprocessing, or destruction. c) The room shall be located and arranged to provide easy access for staff to deposit soiled supplies. d) Soiled utility rooms shall be designed and equipped to minimize/contain the aerosolization of waste. e) A hand hygiene sink shall be provided, and this shall be separate from the utility/cleaning sink. f) A utility/cleaning sink shall be provided for rinsing of gross soil or debris from reusable devices. g) Easy access shall be provided for closed human waste container cleaning devices or disposable human waste container devices. h) Flooring shall be of resilient material complying with Clauses 7.2.2.4 and 12.2.5.2. i) Splash protection shall be provided on walls near water supply, sinks, or human waste management systems. j) Counter tops shall be of non-porous material, free from seams, and tolerant of routine daily cleaning with hospital grade disinfectants. k) The room shall be secure with access restricted to clinical and support staff. l) Doors shall be kept closed and not propped open. m) The room shall be designed to minimize exposure of patients, staff, and visitors to odour, noise, and the visual impact of medical waste operations. n) The room shall have the capacity to

(Continued)

Table 11.1 (Continued)

i) segregate wastes into HCF approved containers;
ii) hold soiled linen and items for return to MDRD;
iii) contain a human waste management system (HWMS);
iv) contain supplies associated with waste management systems; and
v) provide for cleaning soiled patient equipment that is not returned to MDRD (IV poles, commode chairs, etc.).

o) Spray wands shall not be used for rinsing of items. Equipment used for removal of gross soiling shall minimize aerosolization of particulates.
p) Space shall be provided for separate mobile containers for soiled linen, general waste, medical/hazardous waste, confidential waste, and recycling, etc.
q) The room shall provide storage for carts that will be used to move the soiled material from the room.
r) A human waste management system shall be provided. It shall be designed to contain any splash and the controls shall be located so as not to expose staff to contaminants.
s) A washer disinfector shall be provided for the low- to intermediate-level disinfection of soiled, non-critical, reusable medical devices and other soiled patient devices in accordance with the functional program.
t) Soiled utility rooms can have specific needs depending on the clinical unit. Specific needs shall be identified in the functional plan and provided for within the space.

Advisory:

a) Access to PPE for unit-based decontamination and cleaning should be available at the room entrance.
b) The use of stainless steel counters and shelves should be considered.
c) Soiled utility rooms may be centralized or decentralized depending on the delivery of care.
d) Two soiled utility rooms may be provided in consideration of staff travel distances.
e) Access to the soiled utility room may be from two sides of the care space. The soiled utility room shall not be used as an entrance to the care space.
f) Wall finish materials should be smooth and impact-resistant wall board where heavy carts are exchanged in the space.
g) Flooring finishes should be able to withstand rolling equipment and provide minimal rolling resistance.
h) Wall base and floor edges should be an integral cove base, tightly sealed against the wall, and constructed without any gaps.
i) If spray wands are already installed in an existing space undergoing renovation, they should be removed.

(Continued)

Table 11.1 (Concluded)

40	Small multi-disciplinary assessment/ treatment room	11.0	**Mandatory:** a) A separate storage area shall be provided nearby. b) Acoustic and visual privacy shall be provided. c) The room shall accommodate one therapy area for one patient (maximum) or one patient and family member (maximum three people per room). d) The room shall accommodate a workstation or single treatment table against the wall. e) If incorporated, the workstation height shall be adjustable. f) Daylight-simulated light fixtures shall be provided. g) Flexibility shall be provided to allow for task lighting. h) Individual temperature control shall be provided in each room. i) A family/support person space to enable assistance shall be accommodated. j) An easily accessible and safe nurse call system shall be provided. k) The patient space shall not be directly in view of the door to the corridor. **Advisory:** a) Allowance should be made for observation in at least some of the individual therapy rooms. b) Privacy and care requirements, such as visibility by staff from the corridor and patient privacy, should be balanced. c) The window, if provided, should be located to maximize the view outward from sitting space, but also provide the ability for screening. d) Contrasting colours of different planes and furniture should be used for ease of orientation. e) A window in the door is possible, but there should be provision for privacy.

(Continued)

Table 11.1 (Continued)

41	Large multi-disciplinary assessment/ treatment room	46.5	**Mandatory:** a) Audio and visual privacy shall be ensured. b) The room shall accommodate one therapy area for a number of patients. c) The treatment table shall be centrally located for ease of therapy on both sides. d) The workstation shall have adjustable height. e) A minimum 1100 mm shall be provided at the foot of the treatment table. f) A bobath-sized template shall be used for the standard treatment table area. g) Storage for staff-accessible patient supplies shall be provided in the room. h) A counter for staff access shall be provided. i) Wall space and backing shall be provided for mirrors. j) Daylight-simulated light fixtures shall be provided. k) Flexibility shall be provided to allow for task lighting. l) Multiple electrical receptacles shall be provided to allow flexibility in furniture/lighting placement. m) Individual temperature control shall be provided in room. n) A family/support person space to enable assistance shall be provided. o) An easily accessible and safe nurse call system shall be provided. p) The patient space shall not be directly in view of the door to the corridor. **Advisory:** a) Privacy and care requirements, such as visibility by staff from the corridor versus patient privacy, should be balanced. b) Contrasting colours of different planes and furniture should be used for ease of orientation. c) A window in the door may be provided, but there should be provision for privacy.
42	Staff coat room	Varies	**Mandatory:** The room shall be secure with access restricted to clinical and support staff. **Advisory:** a) The staff coat room should be located close to the entry into the department. b) An upper shelf, with a continuous hanger rod below, should be provided along one wall of the room and at the far end.
43	Staff room	Varies, depending on staffing numbers; estimated 2.5 m² per occupant, including circulation	**Mandatory:** The staff room shall be located within the services, but away from the main activity and patient areas. **Advisory:** a) Natural light should be considered. b) Kitchenette equipment may be provided. c) If a separate staff room is provided, it should be a minimum of 10.0 m².

(Continued)

Table 11.1 (Continued)

44	Storage room	Varies	**Mandatory:** a) Storage space shall be provided convenient to each program/activity area. b) Dedicated space, subdivided or separated, shall be provided for large and small equipment. c) Stored items shall be easily accessible. d) Easy handling of supplies and equipment shall be ensured. e) To provide security, storage areas shall be lockable. A safe working environment shall be provided. f) Storage space shall be designed (i.e., with the appropriate type, location, and amount) to accommodate the expected equipment inventory. g) Shelving systems shall be adjustable and easily maintained. h) Storage rooms for clean and sterile medical supplies shall comply with CAN/CSA-Z314. i) Equipment storage areas shall incorporate the necessary electrical or mechanical supports and features as required by the equipment manufacturer. **Note:** *Such supports and features can include* a) *special structural design for storage and access;* b) *electromechanical connections; or* c) *shielding.* **Advisory:** a) Providing regularly spaced storage for clean and soiled equipment, and for ease of access and improved operating efficiencies, should be considered (e.g., circulation patterns that will develop in the delivery of established programs should be considered to create efficiencies wherever possible). b) Providing overflow space to meet unexpected storage situations should be considered. c) Consideration should be given to storage requirements for all care delivery support services (building services as well as the therapeutic equipment services) in order to determine where storage services can be combined and what their relationship to each other might imply. d) Where shelving systems are extending to/above shoulder height, a suitable step stool should be provided as well as the space for it to be used and stored.
45	Sub-sterile supply/ case cart holding area	Varies; assume 1.2 per cart	**Mandatory:** a) The room shall be developed with storage for case carts and more permanent items. b) A wall-mounted sink shall be provided alongside the base cabinet, located to avoid splashing on supplies. c) The room shall be secure with access restricted to clinical and support staff. **Advisory:** One wall should be provided with a base cabinet with closed doors and drawers and with wall cabinets, also with doors, above.

(Continued)

Table 11.1 (Continued)

46	Tub/shower room (central)		**Mandatory:** a) There shall be a hand hygiene sink at the entrance/exit. b) Each bathtub or shower shall be an individual room or enclosure that provides privacy for bathing, drying, and dressing. c) Minimum room clearances shall i) conform to the requirements of CSA B651 for the building occupants most likely to use the room; and ii) allow for health care worker assistance to the patients. d) Tub-mounted lifting devices shall be installed where such lifting will occur. e) There shall be easy access to hand hygiene sink within the room. f) Controls shall provide flexibility for both patient and staff access. g) Each tub/shower room shall be equipped with a non-moisture absorbing emergency staff call cord. It should be easily identifiable, accessible from the wet area, and descend far enough to be within the reach of an occupant who has fallen or collapsed. h) Each room shall have storage space for supplies and PPE for tub cleaning after each patient use. i) Tub/shower rooms shall not be used for any other purpose. j) Wall bases shall be integral with the floor, tightly sealed against the wall, and constructed without voids. k) Flooring material shall be slip resistant and shall not support growth of mildew or mould. l) Wall covering shall be moisture proof/resistant. m) Ceiling coverings shall be non-porous and moisture resistant. n) Tubs with recirculating water jets shall not be used, except as provided in Clause 8.3.3.2 for intrapartum suites. o) For stretcher shower rooms, the room shall have a minimum width of 3500 mm, and a minimum 1800 mm shall be provided on one side of the shower and 1200 mm on the other side. p) In shower rooms, separate drains shall be provided in the entryway and shower area. q) Tub rooms shall have a separate grooming area with a sink and shelf. Shower rooms do not require a grooming area. r) Access to oxygen and medical vacuum shall be provided within the room. s) A heat lamp shall be provided.
	Therapeutic tub room	16.0	
	Stretcher shower room	16.0	

(Continued)

Table 11.1 (Continued)

			Note: *See Clause 12 for ventilation requirements beyond the National Building Code.* **Advisory:** a) Unless each occupant room is provided with an ensuite, at least one standard bath for every 12 beds should be provided for general use. b) A separate and enclosed toilet should be considered for central tub/shower rooms. Where provided, it shall be in close proximity to the tub or shower and within the suite space. c) These rooms should be easily located for access by all staff. d) Natural light should be provided, if possible, with privacy screening of the window (frosted glazing, movable window treatment, etc.). e) Tub/shower rooms should include a shelf and hook for patient supplies.
47	Waiting area/ rooms	Varies;	**Mandatory:** a) Waiting rooms for patients and accompanying persons shall be located close to the entrance to the various departments/provider's suite. b) Zones shall be created so that the more infectious persons are in a separate area. **Note:** *Zones can be established through seating, air flow, colours, walls, etc.* c) Public washrooms shall be provided in close proximity. **Advisory:** a) Space should be provided for waiting in wheelchairs. b) Seating should be comfortable furniture and of enough diversity for normal and bariatric patients. c) Wall- or ceiling-mounted televisions should be distributed throughout the area for viewing by most of those waiting. d) Signage should direct people to nearby vending machines. e) Telephones should be provided with local calling access. f) Waiting rooms should be so located that they can be observed by the appropriate staff in their appointed location.
	Seating, general	Assume 1.5 per seat	
	Seating, for at risk areas (e.g., emergency dept.)	2.0 per seat	
	Wheelchair/ scooter/bariatric	3.0 per seat	
	Stretcher	5.0 per seat	

(Continued)

Table 11.1 (Continued)

			Bariatric **Mandatory:** a) Consideration should be given to creating seating areas designed specifically to accommodate a bariatric patient, family member, visitor, or staff members. b) The minimum clear opening of all doorways for spaces that provide bariatric access shall be 1220 mm (4 ft-0 in). c) Doorways shall have a level wheeled mobility device maneuvering space on both sides of a door as specified in Clause 7.8.8.1.4. **Advisory** a) Space should be provided for waiting in wheelchairs. b) Seating should be comfortable furniture and of enough diversity for normal and bariatric patients. c) Wall- or ceiling-mounted televisions should be distributed throughout the area for viewing by most of those waiting. d) Signage should direct people to nearby vending machines. e) Telephones should be provided with local calling access. f) Waiting rooms should be so located that they can be observed by the appropriate staff in their appointed location.
48	Washroom (public) Single accessible Single accessible: 2-piece Washroom Bariatric access; 2-piece washroom	4.6 Refer to CSA B651 and applicable Codes for standard and accessibility requirements 7.7	**Mandatory:** a) The toilet and sink shall be hands-free operation. b) Dispensers for paper towels shall be hands free (i.e., the hands only touch the towel). c) A mirror and coat hooks shall be provided. d) Toilets with tanks shall not be used due to the risk of condensation.
49	Work area (staff/ student)	4.6 per workstation and additional circulation space	**Mandatory:** a) Workspace for nursing, allied health professionals, clinicians, clerical staff, and students shall be provided in correlation with the activity of the unit/suite. b) A dedicated hand hygiene sink shall be placed by the staff work area. c) A nurse call/intercom shall be provided.

(Continued)

Table 11.1 (Concluded)

	Advisory: a) Pneumatic tubes should be considered for direct connections to the laboratory and pharmacy. b) An area with electrical receptacles to store and charge small electrical equipment (i.e., portable monitors) should be close to the staff work area. c) A tack board should be provided for display of patient-received cards, photos, and medical information relating to the specific patient. d) There should be a cleanable white board for the staff to diagram communication and information to patients, staff, and visitors. e) There should be a TV and multi-media player (wall or ceiling mounted).

12 Building services and environmental design

12.1 General

Clause 12 describes the specific requirements for building systems within and surrounding a HCF.

Building systems shall be designed in accordance with the OASIS principles as follows:

a) operations (including performance, reliability, flexibility, and adaptability);
b) accessibility;
c) safety and security (including emergency preparedness);
d) infection prevention and control; and
e) sustainability (including energy efficiency, life cycle analysis, and maintainability).

12.2 Architectural systems

12.2.1 Envelope

12.2.1.1

Wall systems and materials shall be chosen to control the impact of exterior noise and vibrations (e.g., traffic or industrial activities adjacent to the site) on the needs and services of health care.

12.2.1.2

Strong and easy-to-maintain material should be chosen to prevent vandalism.

12.2.1.3

At least one entry door shall be a minimum of 1220 mm wide to accommodate bariatric persons.

12.2.1.4

If revolving doors are used, pedestrian doors shall be installed nearby.

12.2.1.5

A simple, easy-to-maintain design for exterior windows shall be used, with a low number of mullions used.

12.2.1.6

The building envelope shall be designed to facilitate compliance with the HVAC requirements (e.g., temperature, humidity, and differential space pressurization) specified in CAN/CSA-Z317.2.

12.2.1.7

Lower humidity buffer spaces should be provided to separate spaces with high relative humidity from the building envelope. To make such separation effective, design partitions and mechanical system air pressure differentials should be used to minimize humid air transfer to buffer spaces.

Where high humidity space cannot be buffered from the building envelope, design shall prevent condensation within the building envelope.

Note: *Indoor relative humidity of 30% or greater can result in excessive condensation on or within the building envelope during winter.*

12.2.2 Ceilings and clearances

12.2.2.1

The minimum ceiling height shall be 2.4 m with the following exceptions:

a) Ceilings in corridors, storage rooms, toilet rooms in these spaces shall be not less than 2.4 m in height. Ceiling heights in small, normally unoccupied spaces may be reduced.
b) Ceilings in radiographic, operating, and delivery rooms, and other rooms containing ceiling-mounted equipment or ceiling-mounted surgical light fixtures, shall be of sufficient height to accommodate the equipment or fixtures and their normal movement.
c) Patient bedrooms and secure/observation rooms treatment rooms in mental health units shall have a minimum ceiling height of 2.75 m.
d) Minimum ceiling heights for specialized areas (e.g., ORs) are specified in Table 9.2, Items 1 to 3.

12.2.2.2

The minimum overhead clearances shall be as follows:

a) Suspended tracks, rails, and pipes located in the traffic path for patients in beds and/or on stretchers, including those in inpatient service areas, shall be not less than 2.2 m above the floor. Clearances in other areas may be 2 m.
b) Where existing structures make the ceiling clearance in Item a) impractical, clearances shall be as required to avoid injury to individuals, up to 1.9 m in height.

12.2.3 Doors

12.2.3.1

All doors between corridors, rooms, or spaces subject to occupancy shall be of the swing type, with the following exceptions:

a) elevator doors;
b) manual or automatic sliding doors in locations where fire and other emergency exit requirements would not be compromised and where cleanliness of surfaces can be maintained; and
c) sliding doors in rooms designed for bariatric patients.

Sliding doors that recess into a wall cavity (i.e., pocket doors) shall not be used in HCFs, because the pocket cannot be adequately cleaned.

12.2.3.2

Measurements for door width and height shall be taken as the nominal dimension of the main door leaf (not including the side leaf), ignoring projections of frame and stops. Special consideration shall be given to the width and height of doorways to ensure delivery and removal of equipment is not impeded or prevented and that stretchers and bed movement is not hampered.

12.2.3.3

The minimum door width for inpatient bedrooms shall be 1220 mm or 1050 mm plus a 305 mm side leaf to facilitate the passage of patient beds, stretchers, and equipment.

Note: *The side leaf could need to be increased, e.g., to accommodate emergency access in a mental health facility.*

12.2.3.4

All doors used for passage of stretchers or beds should have a usable width of at least 1100 mm.

12.2.3.5

Oversized doors should be provided to building circulation corridors for change-out and movement of floor-mounted equipment.

12.2.3.6

Door widths for other HCF areas shall be sufficient for the movement of the equipment, office furniture, etc., that will be used in the area.

12.2.3.7

Frame and/or door protection should be provided in areas exposed to heavy traffic and/or carts.

12.2.3.8

The minimum door height shall be 2100 mm to provide clearance for movement of beds and other equipment (such as IV poles).

12.2.3.9

Rooms that contain bathtubs, sitz baths, showers, and/or toilets for inpatient use shall be equipped with doors and hardware permitting emergency access from the outside. When such rooms have only one opening or are small, the doors shall open outward or in a manner that will avoid pressing a patient who may have collapsed within the room. Outpatient programs should also be designed with these considerations.

12.2.3.10

Where required by the functional program, door latches on patient toilet rooms in psychiatric nursing units shall be designed to allow staff to control access.

12.2.3.11

Safety glass, tempered glass, or impact-resistant plastic glazing materials shall be used for interior windows in doors. Where windows are provided in doors to imaging rooms, they shall be fitted with operator controlled screening and be radiation shielded where necessary.

Note: *This is especially important in pediatric, adolescent, and mental health unit corridors.*

12.2.3.12

Door closing devices should not be used on patient room doors. If a door closing device is required on the inpatient bedroom door, it shall be mounted on the public side of the door rather than the private patient side of the door, and it should be within view of a nurse or staff workstation.

12.2.3.13

Door hinges shall be

a) designed to minimize points for hanging (i.e., by using a piano hinge type and rounded tips); and
b) selected to ensure patient safety, taking into account the age, mental state, and level of care of the patient.

Note: *Consideration should be given to flexibility (i.e., possible future changes in room or area function).*

12.2.3.14

All door hardware shall have tamper-resistant fasteners.

12.2.4 Windows

12.2.4.1 General

12.2.4.1.1

All rooms occupied by patients or staff on a regular basis shall have glazed windows to achieve external views and/or make use of direct or indirect natural light, where practical. All patient bedrooms shall have external windows overlooking external areas. Materials and methods that resist moisture and mould shall be used.

12.2.4.1.2

Unless otherwise prescribed by applicable requirements, low window sill heights (no higher than 600 mm) shall be installed to permit views to the outdoor by a patient lying in bed. A wide internal window sill may be used for ornaments and photographs within sight and reach of patient.

Note: *Provincial/territorial and local building codes can apply.*

12.2.4.1.3

Windows shall be glazed as follows:

a) All glazing (both interior and exterior), borrowed lights, and glass mirrors shall be fabricated with tempered safety glass or protected by polycarbonate, laminate, or safety screens.
b) Doors, sidelights, borrowed lights, and windows glazed to within 457 mm of the floor shall be constructed of safety glass, wired glass, or plastic glazing material that resists breakage and creates no dangerous cutting edges when broken. Similar materials shall be used in wall openings of playrooms and exercise rooms unless otherwise required for fire safety.
c) Windows used in non-security areas shall have a breaking strain of not less than 15 kg.
d) Glare and excessive heat gain or loss should be controlled.

12.2.4.1.4

Window opening mechanisms that prevent persons from climbing in and out of windows shall be selected.

Note: *This is of particular relevance in areas accommodating persons with dementia, children, and patients with mental health conditions.*

12.2.4.1.5

The total area of required external windows and/or external glazed doors should have a net glazed area of not less than 10% of the floor area of the room. An opening component equal to not less than 5% of the floor area of that same room is considered highly desirable.

12.2.4.1.6

The window design process shall include consideration of cleaning. The selection of a cleaning method will depend on the type and location of windows used.

12.2.4.2 Security

Entry through perimeter windows should be minimized by the use of options such as

a) reinforcing windows to resist unauthorized entry;
b) using heavy gauge glass bricks or laminated glass panels (in areas that require natural light but no ventilation) that are securely mounted in the frame;
c) permanently closing older unused windows by fixing with bolts or screws;
d) applying film to glass to resist breakage or fit safety glass;
e) in areas where glass could be damaged, avoiding larger pane sizes as smaller panes are inherently stronger for a given thickness than larger panes; and
f) use of impact-resistant Grade A safety glass complying with AS/NZS 2208 in all security areas.

Note: *Polycarbonates are not recommended as a window glazing material as this material suffers from surface scratching and deteriorates, thus reducing vision.*

12.2.4.3 Window treatments

12.2.4.3.1

Window treatments such as sun shading, blinds, curtains or electronic control of transparency may be used to enhance patient comfort, light control, privacy, to produce a home-like atmosphere and/or for energy conservation. Window treatments shall be durable and easy to clean. If a failure in the power supply would cause opaqueness, the electronic control shall be connected to emergency power.

Note: *Drapes or shades of fireproof fabric can make attractive window coverings and absorb sound.*

12.2.4.3.2

Fabrics/materials shall meet applicable fire safety requirements.

Note: *Provincial/territorial and local fire codes can apply.*

12.2.4.3.3

Pull-down cords shall not be used.

Note: *Pull-down cords pose a potential safety risk to children, as well as to confused or mental health patients.*

12.2.4.3.4

Insect and security screens shall be provided where windows are able to be opened. They shall be accessible to staff from inside the room.

Note: *Operable windows can create security problems which can include glazing, locks, ability for people outside to look in, and the potential to facilitate break-ins. Operable windows can also create ventilation problems and challenges with temperature and humidity.*

12.2.4.3.5
Blinds to external windows should be installed between double glazing.

12.2.4.4 Nurseries

12.2.4.4.1
Babies should be placed so that they are at least 610 mm from external windows at all times. There should be double-glazing to minimize radiant heat loss and some shading to prevent rooms from overheating.

Note: *Light and heat transfer can be controlled by reflective or tinted glass or integral venetian style blinds.*

12.2.4.4.2
Shading devices shall be neutral in colour or opaque to minimize colour distortion from transmitted light.

12.2.4.4.3
Windows from nurseries into corridors, if provided, should be double glazed with integral venetian blinds controlled from within the nursery.

Note: *Windows to nurseries can interfere with family privacy.*

12.2.4.5 Diagnostic imaging

12.2.4.5.1
Natural light shall be provided where possible in diagnostic imaging services.

Note: *Although imaging rooms are usually windowless, an attempt should be made to provide natural light wherever possible as it contributes to a sense of wellbeing, decreases disorientation, and eases the stress associated with potentially uncomfortable or painful procedures.*

12.2.4.5.2
Staff rooms, waiting areas, and public spaces within diagnostic imaging should have access to natural light and preferably a pleasant exterior view.

12.2.4.5.3
Where windows are provided in imaging rooms, they should be fitted with operator controlled screening and be radiation shielded where necessary.

12.2.4.7 Laboratory

12.2.4.7.1
Windows in laboratories shall be designed to minimize glare.

Note: *Glare can be a significant issue in laboratories where the outside windows are large and where either direct sunlight or reflected sunlight can enter the laboratory, and computer screens and monitors are glare-affected.*

12.2.4.7.2
Consideration should be given to the changing path of the sun between winter and summer and the concern that in laboratories that operate over extended hours, staff could be operating equipment at

sunrise and sunset when direct sunlight entering the building is difficult to eliminate without external louvres.

Notes:

1) *Tinting is not always effective and solar-type blinds that still admit light only minimize the problem.*
2) *Placing benches at right angles to the window does not work in practice as monitors and computers could be by necessity oriented to the window.*
3) *In practical terms, the only effective means of controlling glare is to prevent sunlight getting onto the windows.*

12.2.4.7.3

Staff rooms and offices should have access to natural light and preferably a pleasant exterior view.

12.2.4.8 Dialysis and chemotherapy

12.2.4.8.1

Dialysis and chemotherapy areas should be designed with treatment bays (sized to take a chair or a bed) adjacent to each other in sight of a staff station.

12.2.4.8.2

An exterior view should be provided for all patients either through being adjacent to a window or by keeping sight lines to windows clear of obstruction.

Note: *This could require the slanting of chairs or beds away from the traditional vertical alignment. Instead of the foot of the chair or bed pointing at a perpendicular angle to the staff station, this could be amended to 225° to facilitate the view.*

12.2.4.9 Pharmacy

The pharmacy area should be constructed with as few windows as possible. Where windows exist in the pharmacy or in perimeter doors, they shall be of impact-resistant Grade A safety glass in compliance with AS/NZS 2208.

12.2.4.10 Mirrors

Mirrors shall not be installed at hand hygiene stations in food preparation areas, nurseries, clean and sterile supply areas, scrub sinks, or other areas where asepsis control would be lessened by hair combing.

12.2.5 Finishes

12.2.5.1 General

12.2.5.1.1

Cubicle curtains and draperies shall be non-combustible or flame-retardant and shall be compliant with the *National Fire Code of Canada*. Materials and certain plastics known to produce noxious gases when burned shall not be used for mattresses, upholstery, and other items insofar as practical.

12.2.5.1.2

All counter tops in clinical, patient-care areas (i.e., exam rooms, treatment areas) should be non-porous, solid surface material that is easily cleaned and withstands repeated disinfection.

12.2.5.1.3

All upper cabinet millwork should either extend the full height of the wall to the ceiling or be angled to minimize dust accumulation on top of the units. Units should have closable cupboard doors.

12.2.5.1.4

All furnishings shall be composed of non-permeable, cleanable materials and be able to withstand repeated disinfection.

12.2.5.2 Floors

12.2.5.2.1

Floor materials shall be

a) durable, with appropriate wear-resistance for the location
b) installed with minimal seams and creases that could harbor bacteria;
c) easily cleanable;
d) slip-resistant to a degree appropriate to the location, environment, and patient population being served;
e) of a type that does not create "drag" or "resistance" for patients using walking aids and wheelchairs;

Notes:

1) *Heat welded seams provide a surface that is nearly seamless.*
2) *Cove flooring should be installed properly with solid backing.*

f) resistant to food acids (including at seams and joints); and
g) maintainable without toxic stripping and finishing.

12.2.5.2.2

Floors shall be installed with an integral coved base at all walls. The integral coved base shall be tightly sealed against the wall and constructed without gaps behind that could allow distortion or shifting.

12.2.5.2.3

Floor materials in clinical and support service areas, and in areas subject to moisture (including from frequent wet-cleaning), shall be

a) monolithic and coved from the floor, tightly sealed with the wall, and constructed without voids;

Note: *A floor may be considered monolithic if all seams are heat-welded or permanently sealed using another method.)*

b) seamless (i.e., heat-welded or sealed seams) with an integral coved base at all walls;
c) resistant to water penetration; and
d) resistant to damage by germicidal cleaning solutions.

Floor surfaces shall be designed to provide a comfortable walking surface with sufficient traction for shoed traffic. For wet areas with barefoot traffic (e.g., showers or tub room), flooring shall be suitable to the application and use for shoed and barefoot traffic. Floor materials shall be selected to make detection of fluids easier and minimize risk of slips, trips, and fall injury.

Note: *Biological and procedural fluids can create hazards on floor surfaces, particularly at night.*

12.2.5.2.4

Carpeting, if used, should be minimal. Carpeting should not be used in areas where there is a risk of spills, or where there is risk of infection from dust and particulates containing environmental pathogens

in the patient population served by the area (e.g., burn units, critical care units, operating rooms, transplant units). See Clause 12.2.5.2.10.

Carpeting shall not be used in areas that normally house immunocompromised patients.

If carpeting is used, it shall be cleanable with hospital-grade cleaners and disinfectants. Carpet tiles, if used, shall be of a design that is easily removed, discarded, and replaced.

Note: *A generic description for a carpet product for health care would include the following criteria:*

a) *solution dyed fibre;*
b) *antibacterial treated; and*
c) *backing as follows:*
   i) *for carpet tile, a non-absorbent backing; and*
   ii) *for rolled carpet, a vinyl cushion or condensed cushion backing that forms a monolithic wall-to-wall moisture barrier repairable with bond seam.*

12.2.5.2.5

Floors in areas used for food preparation or food assembly shall be water-resistant and slip-resistant to a level appropriate to this application.

12.2.5.2.6

Floors subject to traffic while wet (such as shower and bath areas, kitchens, and similar work areas) shall have a cleanable non-slip surface.

12.2.5.2.7

The floors and wall bases of all operating rooms and any delivery rooms used for caesarean deliveries shall be monolithic.

12.2.5.2.8

Floors in critical care areas, treatment rooms, and inpatient bedrooms shall incorporate flood-resistant cove bases.

Note: *The intent is to prevent infiltration of water into walls and enable fast cleanup of critical care areas. Flood-resistant cove bases should be considered in all areas of a HCF that are essential to ongoing operations.*

12.2.5.2.9

Floors in areas and rooms in which flammable anaesthetic agents are stored or administered shall comply with NFPA 99.

12.2.5.2.10

Flooring shall be adequate to meet load requirements for equipment, patients, and personnel.

12.2.5.2.11

Floor and wall areas penetrated by pipes, ducts, and conduits shall be tightly sealed to minimize entry of rodents and insects. Joints of structural elements shall be similarly sealed.

12.2.5.2.12

Floor finishes in all patient care areas and corridors for emergency should have the following characteristics:

a) acoustic properties that reduce sound transmission; and

b) shock absorption sufficient to optimize staff comfort without hampering the movement of beds.

Note: *The choice of flooring should balance shock absorption qualities with the need for ease of movement for beds and mobility devices.*

12.2.5.2.13

Rooms used for protective isolation and anterooms adjacent to rooms used for protective isolation shall have seamless flooring with integral coved base.

12.2.5.2.14

Anti-fatigue flooring should be provided at workstations where there will be prolonged standing.

12.2.5.3 Walls

12.2.5.3.1

Wall finishes shall be washable. In the vicinity of plumbing fixtures, wall finishes shall be smooth and water-resistant.

12.2.5.3.2

The bottom edge of drywall shall be set at a minimum of 12 mm above the finished floor level and the gap shall be sealed.

Note: *This prevents wicking of surface water into drywall.*

12.2.5.3.3

In dietary and food preparation areas, wall construction, finish, and trim, including the joints between the walls and the floors, shall be free of spaces that could harbour insects or rodents.

12.2.5.3.4

In operating rooms, caesarean delivery rooms, airborne isolation rooms, and sterile processing rooms, wall finishes shall be free of fissures, open joints, or crevices that can retain or permit passage of dirt particles.

12.2.5.3.5

Moisture resistant drywall shall be used in all critical care areas

12.2.5.3.6

Wall and corner protection shall be installed in high traffic areas that are prone to damage. Service corridors shall have protection to the lower part of the walls to minimize damage from carts and stretchers.

12.2.5.3.7

Protective coving shall be used from the floor and up the wall in all areas where there will be frequent or constant moisture. These include, but are not limited to,

a) medical device decontamination areas;
b) workrooms where soiled materials are sorted or processed; and
c) shower facilities, change areas, and other areas that are frequently subject to wet cleaning methods.

12.2.5.3.8

Fire and smoke separations shall be clearly identified on both sides above ceilings. Labelling should be visible from any point in the space above the ceiling. There should be at least one label every 3 m on straight runs and additional labels as needed around corners to meet the visibility requirement.

Note: *Labelling should indicate the fire rating of the wall material.*

12.2.5.4 Ceilings

12.2.5.4.1

Ceilings in clinical areas shall limit passage of particles from above the ceiling plane into the clinical environment.

Note: *The OASIS principles should be taken into account when selecting ceiling materials. The ceiling design should be compatible with mechanical/structural systems (e.g., sprinkler heads, patient lift).*

12.2.5.4.2

Ceilings in restricted areas, semi-restricted areas, and areas prone to moisture buildup shall be monolithic and constructed with solid surfacing materials or drywall as a seamless or unbroken surface. Service access panels, where permitted, shall be limited to the number of booms for servicing. Service access panels shall be clipped and sealed to maintain the seal after replacement to prevent the transmission of contaminants into or out of the occupied space.

12.2.5.4.3

Monolithic finished ceilings shall be installed in

a) AIRs and anterooms;
b) burn units;
c) inpatient bedrooms for mental health patients;
d) three-piece washrooms;
e) shower rooms;
f) tub rooms;
g) operating rooms and associated clean and sterile corridors and core areas;
h) minor surgical procedure rooms;
i) MDRDs;
j) morgues;
k) clean and sterile storage areas;
l) kitchens;
m) specialized radiographic rooms; and
n) other clean-room areas such as labs and pharmacy areas (as per accreditation or other jurisdictional requirements).

Notes:

1) *Monolithic finished ceilings refer to solid, unbroken or seamless surfaces that are not porous and not removable, with a washable surface to allow for the appropriate level of cleaning to occur (e.g., solid surfacing, epoxy, or washable paint).*
2) *Integrated pre-engineered ceiling systems may be used within areas of monolithic ceilings. These ceilings should consist of*
   a) *a heavy duty tee grid system forming framed openings suitable for mounting diffusers, lights, equipment mounting panels, and clip down access panels;*
   b) *grid and panel finishes formulated to resist deterioration from hospital-grade cleaners and disinfectants; and*

c) *continuous gasketing to prevent air and contaminant migration between the ceiling plenum and occupied space.*

12.2.5.4.4

Monolithic finished ceilings in semi-restricted areas shall be smooth, scrubbable, non-moisture-absorbing, non-perforated, capable of withstanding cleaning with chemicals, and without crevices that can harbour mould and bacterial growth.

12.2.5.4.5

Ceilings, exposed ceiling structure, and ceiling-mounted equipment in areas normally occupied by staff in food preparation and food storage areas shall be cleanable with routine housekeeping equipment.

12.2.5.4.6

All conduits, piping, duct work, and open construction systems shall be covered by a finished ceiling in locations where dust fallout would present a potential problem. All overhead piping and ductwork in the dining and food handling areas shall be concealed behind a solid finished ceiling.

12.2.5.4.7

Monolithic finished ceilings are not required in mechanical and equipment spaces, shops, general storage areas, and similar spaces, unless required for fire-resistive purposes.

12.2.5.4.8

Replaceable acoustic tile ceilings should be used to assist in managing ambient noise for occupants where equipment is frequently noisy. Acoustical tiles should be used in areas such as NICU and palliative care units and inpatient units.

12.2.5.4.9

In private patient bathrooms, any plumbing, piping, ductwork, or other potentially hazardous elements shall be concealed above a ceiling. The ceiling and any access panels shall be of the tamper-resistive type or of sufficient height to prevent patient access. Ventilation grilles shall be secured and have small perforations to eliminate their use as a tie-off point or shall be of sufficient height to prevent patient access.

12.2.5.4.10

Where ceiling-mounted equipment is installed, support structures shall be provided above the finished ceiling in accordance with the equipment manufacturer's instructions.

12.2.5.4.11

In all mental health locations, including inpatient bedrooms, washrooms, secure/observation rooms, and patient activity/lounges areas, the ceiling and air distribution devices, lighting fixtures, sprinkler heads, and other appurtenances shall be of a tamper resistant type.

12.2.6 Elevators

12.2.6.1 Description

Elevators are the primary means used for vertical movement in HCFs and are expected to transport of both people and materials in a safe, reliable, effective, and responsive manner. To encourage a consistent approach to vertical transportation system design, while standardizing requirements in key

areas of concern, this Clause provides a basic platform of design considerations, performance expectations, operational features, and equipment characteristics for elevators. While it is recognized that strict adherence to all elements might not be universally appropriate, deviation from the stated requirements and guidelines should be undertaken only after due consideration of the full impact of such change(s) on the overriding design objectives of this Standard.

12.2.6.2 General

12.2.6.2.1

The elevator system shall be designed to accommodate the diverse activities of the HCF, its staff, and its patients, in a manner that contributes the overall efficiency and effectiveness of HCF operations.

Elevator systems shall be designed to ensure there is sufficient capacity to accommodate the wide range of user and functionality requirements, in a manner which satisfies expectations for safety, reliability, responsiveness, accessibility, and operational efficiency. The number and grouping of elevators required for a specific project shall be determined following traffic studies by an experienced vertical transportation professional.

Consistent with associated architectural, structural, and related design provisions, elevators shall be designed to accommodate potential vertical expansion or change-in-use of the HCF, with a minimum of alterations. This may be accomplished through the inclusion of additional elevator shafts for future development.

12.2.6.2.2

Different traffic types (i.e., public, inpatient, materials, trauma, dedicated use) should be separated as much as possible to minimize the potential for delayed service. Depending upon the volume of traffic anticipated for a specific project, separate systems shall be provided for general public, patient transfer, support services, and dedicated-use applications.

12.2.6.2.3

Elevators shall provide accessible transportation for people and materials to all functional areas and shall conform to ASME A17.1/CSA B44, Appendix E, and applicable requirements.

Note: *Provincial/territorial and local regulations and bylaws can apply.*

Provisions should be considered for persons with special mobility needs and other forms of disabilities, such as learning difficulties or mental disorders.

12.2.6.2.4

Elevators should be provided with a reflective surface on walls opposite entrance openings to permit a person in a wheelchair or mobility device to see behind them when backing out of the car.

12.2.6.2.5

Public elevators shall be located in close proximity to main entrances and stairways.

All elevator systems shall be located to minimize walking distances to/from key destinations, with maximum range of 60 m.

12.2.6.2.6

Dedicated use elevators shall be located to provide direct access between functional areas as required for the application (e.g., MDRD to OR; Emergency to OR).

12.2.6.2.7

Elevators other than those assigned for dedicated use shall have a minimum of two elevators per group.

12.2.6.2.8

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

Note: *The use of elevators that open in the front and back is discouraged, as it tends to confuse the public and slow service.*

12.2.6.2.9

Use of passenger elevators having a capacity of less than 1815 kg, and a clear entrance opening width of 1.2 m, should be avoided.

12.2.6.2.10

Depending upon the requirements of a specific project and the relative requirement for the flexibility to employ any elevator for patient movement, public elevators may be configured similar to those dedicated to patient transfer.

Note: *This refers to a design where platforms are deeper than they are wide (typically referred to as a "hospital style" platform).*

12.2.6.2.11

Elevators provided for projects that are classified by applicable building codes as high-rise buildings shall include

a) a designated firefighters elevator; and
b) central alarm and control facilities (CACF) monitor, control, and communication devices.

12.2.6.3 Elevators for patient transfer

12.2.6.3.1

Elevators used for patient transfer and support services shall be configured with platforms that are more narrow than deep, with door opening widths of at least 1525 mm, to accommodate easy movement of beds and material carts. At least one of the elevators for patient transfer shall be able to accommodate a bed that meets the size requirements for bariatric patients.

12.2.6.3.2

A trauma elevator should be provided for transport of trauma patients if the expected number or types of trauma cases warrant it. Where provided, this elevator shall be large enough to accommodate a fully equipped stretcher bed with associated accessories and a staff of six persons. Consideration should be given to the necessity for this elevator to be equipped with special emergency devices such as medical gases, UPS for medical devices, air conditioning, etc. Where provided, the elevator shall be sized with minimum inside car dimensions of 1830 mm wide by 3350 mm deep and be provided with 1525 mm wide centre parting doors. Elevators should be provided with at least two car operating panels, mounted on either side of the entrance opening.

12.2.6.4 Service elevators

12.2.6.4.1

Service elevators for movement of food services supplies and/or other heavy loads (e.g., portable X-ray) should be provided. If service elevators are provided, at least one shall have a loading capacity to accommodate a single piece load of at least 2270 kg and single axle loading of 1135 kg (Class C3 loading).

12.2.6.4.2

If service elevators are provided, at least one shall serve all floors in the building, including the basement, mechanical floors, interstitial floors, and mechanical penthouse levels. Restricted elevator operation via card reader or key switch, to non-public areas shall be incorporated into the system design. This elevator shall also be designed to accommodate Class C3 concentrated loading in accordance with Clause 12.2.6.4.1.

12.2.6.4.3

The elevator system shall include a dedicated means for transporting sterile materials and supplies from the MDRD to surgical areas, and a separate means for the removal of soiled instruments and bio-hazardous waste. Elevators used for each purpose shall be physically separated from each other and operate within dedicated shafts. For Class A HCFs with large surgical facilities, elevators shall be sized to carry at least three case carts 760 mm × 1220 mm at once.

12.2.6.5 System design

12.2.6.5.1 System capacity

Elevator system capacity for both passenger and service function groups shall be based on the peak traffic conditions. The design shall address the following service criteria:

a) traffic patterns;
b) handling capacity;
c) average interval; and
d) average car loading.

The design should assume that staff will travel on both general public and patient transfer systems.

12.2.6.5.2 Equipment type

Hospital facilities having three or more levels shall employ traction type elevators for public and other high traffic elevators and such elevators shall be designed to accommodate a consistent 180 motor starts per hour.

Hydraulic elevators shall be limited to facilities with two levels and a maximum vertical rise of 5.5 m.

Where hydraulic elevators are employed, they shall be of the holeless type (i.e., not requiring excavation to install), employing single-stage, dual direct acting piston/cylinder configurations. Cantilevered single jack designs shall not be used.

On a project specific basis, consideration should be given to use of hydraulic elevators for low traffic, three level applications. Roped hydraulic type shall be employed where rise exceeds 5.5 m.

12.2.6.5.3 Entrances

All entrances shall have 1.5 h fire rating, unless required by project-specific requirements to have a higher rating or where an atrium feature is provided.

Note: *Refer to provincial/territorial building and fire codes.*

12.2.6.5.4 Maintainability

Elevators shall utilize control components which are readily maintainable by a non-original equipment manufacturer (OEM) elevator maintenance organization employing competent personnel.

Elevator equipment shall not contain proprietary software, monitoring, or other devices that limit the HCF's ability to engage a qualified maintenance contractor, other than the OEM/installer, for provision of maintenance services.

Where specialized tools are required to perform these services, such tools shall be provided with the equipment as part of the installation and become the property of the HCF.

Devices and diagnostic equipment shall be maintained so that it will not lose any function over time or contain self-expiring software.

Fault codes, setup parameters, detailed procedural, operating, and troubleshooting instructions plus all other materials shall be provided to the HCF for use by an alternate contractor to undertake maintenance or service.

12.2.6.6 Performance (traction elevators)

12.2.6.6.1

Traction elevators shall maintain their rated speed within ±3%, with smooth average starting/stopping profiles based on minimum acceleration rates 0.9 m/s^2.

12.2.6.6.2

For public traction elevators, the maximum flight time shall be 11.0 s, with the time based on a 4270 mm single floor run and door speed based upon 1220 mm wide centre parting doors.

12.2.6.6.3

For public traction elevators, the door operating times shall be as follows:

a) Nominal door opening time shall be 2.0 s.
b) Nominal door closing time shall be 3.0 s.
c) Time shall be based upon 1220 mm wide centre parting doors.
d) Actual door times shall be adjusted as requested by the HCF to suit actual traffic conditions.

12.2.6.6.4

For public traction elevators, the door dwell times shall be as follows:

a) Nominal car call dwell time shall be 3.5 s.
b) Nominal hall call dwell time shall be 5.0 s.
c) Actual dwell times shall be adjusted as requested by the HCF to suit actual traffic conditions.

12.2.6.6.5

Traction elevators shall consistently stop at floor level ±4 mm.

12.2.6.6.6

Traction elevators shall not produce horizontal peak-to-peak vibrations greater than 15 mg at any point in hoistway, measured during express runs in either direction.

12.2.6.6.7

Machine room noise levels shall not exceed 80 dBA. Door operation noise level shall not exceed 63 dBA.

12.2.6.7 Performance (hydraulic elevators)

12.2.6.7.1

Hydraulic elevators shall provide a full load speed within range of +10% (down) and –3% (up) of the rated speed. They shall maintain speed in either direction, under other loading conditions, within 5% of the respective full load speed.

12.2.6.7.2

For public hydraulic elevators, the maximum flight time shall be 16.0 s, with the time based on a 4270 mm single floor run and door speed based upon 1220 mm wide centre parting doors.

12.2.6.7.3

For public hydraulic elevators, the door operating times shall be as follows:

a) Nominal door opening time shall be 2.0 s.
b) Nominal door closing time shall be 3.0 s.
c) Time shall be based upon 1220 mm wide centre parting doors.
d) Actual door times shall be adjusted as requested by the HCF to suit actual traffic conditions.

12.2.6.7.4

For public hydraulic elevators, the door dwell times shall be as follows:

a) Nominal car call dwell time shall be 3.5 s.
b) Nominal hall call dwell time shall be 5.0 s.
c) Nominal nudging initiation time shall be 20.0 s.
d) Actual dwell times shall be adjusted as requested by the HCF to suit actual traffic conditions.

12.2.6.7.5

Hydraulic elevators shall consistently stop at floor level ±6 mm.

12.2.6.7.6

Horizontal peak-to-peak vibrations for hydraulic elevators shall be limited to a maximum of 15 mg at any point in hoistway, measured during express runs in either direction.

12.2.6.7.7

Machine room noise levels shall not exceed 80 dBA. Door operation noise level shall not exceed 63 dBA.

12.2.7 Acoustics and vibration

12.2.7.1 General

The HCF shall be designed to ensure that the acoustic environment of the building is compatible with the general needs and comfort of the building occupants, and the surrounding residential areas.

12.2.7.2 Architectural sound isolation

12.2.7.2.1

Floor plans shall be developed so that inpatient bedrooms and other noise-sensitive spaces are not located next to high-noise areas (e.g., laundry room, mechanical room). The design should provide both horizontal and vertical separation of acoustically conflicting occupancies.

12.2.7.2.2

Vibration isolation for any equipment with the potential to generate noise and/or vibration intrusions into the facility should be provided. This should include all major building services such as mechanical systems, electrical systems, and plumbing equipment.

12.2.7.2.3

All equipment vibration isolation should be selected on a basis of achieving a minimum 98% isolation efficiency at the lowest operating speed.

12.2.7.2.4

Installation of mechanical equipment shall comply with the manufacturer's specifications for installation (e.g., isolation from vibration).

12.2.7.2.5

The main circulation routes shall be isolated from patient areas, except those routes for clinical staff who work in the patient area. Corridors shall not be located above inpatient bedrooms or other noise sensitive spaces. At a minimum, noise sensitive spaces include, but are not limited to, any space where operations, surgical procedures, patient consultations or exams will occur, as well as ICUs, NICUs, and labour spaces.

12.2.7.2.6

Table 12.1 provides guidance for selecting the minimum sound transmission class (STC) of walls for various room types. Special circumstances might require higher STC requirements than indicated. Large projects with many conflicting adjacent occupancies shall have an assessment by an acoustic consultant to define the STC and associated construction requirements. For glazing located inside partitions that separate non-clinical spaces, the glazing should have a minimum STC rating of STC 35. Doors located inside partitions that separate non-clinical spaces should have a minimum construction or surface weight as determined by an acoustical consultant.

12.2.7.2.7

For partitions that contain glazing or doors that separate clinical spaces, the judgement of an acoustic consultant should be engaged to confirm and develop the sound isolation requirements.

12.2.7.2.8

For partitions that do not contain glazing or doors, the as-built apparent STC (ASTC) performance should be within three points of the values provided in Table 12.1. This will require careful detailing of penetrations, window mullions, and other noise flanking paths.

12.2.7.2.9

For partitions that include doors or glazing, the following shall apply:

a) Non-clinical spaces — The partition should be provided to match the guidelines in Table 12.1, and the glazing/door construction should be provided in accordance with Clause 12.2.7.2.3.

b) Clinical spaces — The partition should be provided to match the guidelines in Table 12.1, and the glazing/door construction should be specified by an acoustical consultant depending on the adjacency.

Table 12.1
Wall sound transmission class (STC) requirements for various room types
(See Clauses 8.3.3.5.1 – 8.3.3.5.3, and 12.2.7.2.3.)

Room	STC
Administrative offices	45
Patient interview/treatment/doctors' offices	50
Senior administrative offices/pastoral	50
Inpatient bedrooms	45
Inpatient bedroom to noisy public space	55
Quiet counselling rooms	50
Operating rooms	50
Meeting/seminar	50
Large auditorium	55
Critical care	50
Labour/delivery	55
Nurseries	55
Mechanical rooms, kitchens, laundry	55+

12.2.7.2.10

Full-height wall construction or drywall ceilings shall be used in rooms with STC 45 or greater.

12.2.7.2.11

For administrative offices where speech privacy is less critical, walls may be terminated at, or slightly above, the suspended ceiling. In these situations, the lay-in ceiling board shall have a minimum CAC rating of 35.

Notes:

1) *Large-scale details showing acoustic seals at junctions of building components should be prepared (e.g., interior partitions to building envelope). The objective is to provide a continuous airtight seal at all junctions.*

2) *If walls do not extend above the suspended ceiling, the fixing of the ceiling grid system to a restraining wall can be subject to provincial/territorial or local regulations and bylaws for seismic restraints of ceiling systems.*

12.2.7.2.12

A complete, airtight sound seal shall be provided through all partitions with sound isolation ratings.

12.2.7.2.13

Massive wall construction (e.g., concrete block, poured concrete, brick) shall be used around areas that produce high levels of low frequency noise.

Note: *Typically, this includes walls around large duct shafts or rooms that contain large mechanical equipment, transformers, or emergency generators.*

12.2.7.2.14

An acoustic consultant should evaluate the need for a floating concrete floor in mechanical and electrical rooms. As part of this evaluation, the consultant should consider the use of isolated interior walls and a noise barrier ceiling to complement the floating floor, if needed.

Note: *A floating floor is rarely required for sound isolation except when spaces with low background noise criteria (e.g., auditoriums and inpatient bedrooms) are located directly below mechanical areas with very loud equipment (e.g., chillers, large open-ended fan units, generators).*

12.2.7.2.15

A structurally separate, double wall construction between public washrooms and occupied spaces shall be built to minimize the transfer of plumbing noises.

All plumbing should be fastened to the interior side of the wall only. Care shall be taken to ensure that no services or other components bridge the structural isolation between the two sides of the wall.

12.2.7.2.16

Operating rooms or laboratories with sensitive equipment should be located as far away as possible from heavily used corridors, mechanical rooms, or other areas that could generate a high level of vibrations.

Note: *At-grade locations should preferably be used to minimize the impact of footfall-induced vibration.*

12.2.7.2.17

Laundry facilities should be located and designed to avoid structural vibration problems. The location of garbage rooms, chutes, and trash compactors should also be considered. For chutes, structural isolation could be required for fan-powered systems. Structural isolation could also be required for laundry hampers or garbage collection containers.

Note: *Laundry facilities located on suspended structures can produce vibration problems.*

12.2.7.2.18

Other equipment (e.g., diagnostic imaging machines) can also cause and be affected by vibration and should be located and designed to avoid structural vibration problems.

12.2.7.2.19

Floors should be designed to ensure that steady-state vibration levels do not exceed the equipment manufacturer's requirements for vibration sensitive equipment, particularly diagnostic imaging equipment and high-magnification microscopes. The approach to satisfying this should consider the sensitive equipment location, vibration isolation of other equipment that has the potential to introduce vibrations into the facility structure and the floor or ceiling thickness/stiffness.

Transient vibration limits provided by the equipment manufacturer should also be reviewed and met.

12.2.7.2.20

At outdoor amenity spaces, the background noise level should be no greater than 55 dBA during the daytime and 50 dBA at nighttime

12.2.7.3 Reverberation and noise control

12.2.7.3.1

A sound absorptive ceiling finish shall be used in nurseries, nurse stations, offices, corridors, cafeterias, large public areas and especially in areas that require voice paging. Ceiling boards or other ceiling finishes should have a minimum NRC of 0.55.

12.2.7.3.2

A highly sound absorptive ceiling shall be used for special care nurseries, and open offices where privacy is important (e.g., home care, large admitting areas). Ceiling boards or other ceiling finishes should have a minimum NRC of 0.75.

Note: *Additional sound-absorbing wall finishes should be considered for special care nurseries, nurse stations, recreation rooms, and other patient activity areas, especially within continuing care facilities. The noise interference from common sources such as televisions, washing machines, dryers, ice machines, and vending machines should be considered, with isolated areas provided for activities associated with this equipment.*

12.3 Structural systems

12.3.1 General

12.3.1.1

The structural design of the HCF shall comply with applicable building requirements.

Notes:

1) *In Canada, requirements for structural design are included in national, provincial/territorial, and local building codes and bylaws.*
2) *Hospitals and emergency treatment facilities are considered post-disaster buildings.*

12.3.1.2

The building structure should be designed for a specified life span in accordance with the needs and expectations of the local and provincial/territorial authorities. This includes all primary structure and the secondary structure supporting cladding systems.

Note: *A 100-year life span is suggested; however, this may be decreased (e.g., to 50 or 60 years) if the type and function of the facility is such that it is likely to be outdated sooner than that.*

12.3.1.3

The building structure should be designed to permit flexibility and to be adaptive to future changes.

12.3.2 Structure

12.3.2.1

The structure of the building shall utilize

a) cast-in-place concrete (beams, columns, slabs, etc.);
b) structural steel systems with concrete topping placed on steel deck; or

c) a structural system with equivalent or better strength and durability as Item a) or b).

Note: *Some jurisdictions have requirements for the use of wood products in construction.*

12.3.2.2

Structural steel joists should not be used in the design of the floor and roof systems in Class A HCF.

Load bearing masonry shall not be used in Class A HCFs.

12.3.2.3

Cast-in-place post-tensioned precast concrete structures and precast hollow core slabs shall not be used in Class A HCF.

12.3.2.4

Expansion joints, including those between existing and new structures, shall be designed to avoid abrupt changes in floor elevation.

Note: *Changes in floor level can be a tripping hazard for patients and can disrupt the movement of stretchers and trolleys.*

12.3.2.5

Anchor points should be included for roof access and activities such as window washing and replacing equipment on multi storey buildings. Anchor points should also be provided in mechanical areas with heavy equipment.

12.3.3 Design loads

12.3.3.1

Patients' bedrooms shall have a minimum floor occupancy live load 2.4 kPa or 9 kN concentrated, whichever produces the more critical effect.

12.3.3.2

General office areas shall have a minimum floor occupancy live load 3.6 kPa or 9 kN concentrated, whichever produces the more critical effect.

12.3.3.3

Records storage areas shall have a design live load that is based on the type and layout of the proposed storage system, but not less than 7.2 kPa.

12.3.3.4

Floors of interstitial spaces shall have a minimum live load 1.5 kPa or 1.5 kN concentrated, whichever produces the more critical effect, plus equipment loads.

12.3.3.5

The structure shall have adequate capacity for suspended piping loads and access routes for heavy equipment. Floors in mechanical rooms shall be designed to accommodate a minimum of 100 mm thick concrete housekeeping pads.

12.3.3.6

As part of the planning process, the HCF shall obtain information on the loads associated with heavy medical equipment such as diagnostic imaging equipment, X-ray equipment, surgical lights, surgical tables, etc. The HCF shall also obtain information on the loads associated with heavy equipment in the MDRD. The structural elements of the building (walls, floors, and ceilings) shall have adequate capacity to support this equipment in the areas where the equipment will be located, and on the access routes to those areas.

12.3.3.7

The minimum roof design live load shall be 1.5 kPa or 1.5 kN concentrated, whichever produces the more critical effect. For roofs over mechanical rooms, the concentrated load shall be increased to 4.5 kN for all elements except metal deck. Roof structures shall be able to support ponded rain load associated with a plugged roof drain.

12.3.3.8

For buildings close to property lines on urban sites, the design process to accommodate snow loads shall include the assumption that the neighbouring property will be built higher than the HCF.

Notes:

1) *The assumed height of the neighbouring property can be based on the local zoning bylaw.*
2) *This typically will produce a triangular snow load with an accumulation factor, Ca, of 3.75 at the property line.*

12.3.3.9

When there is a known plan to change the usage of an area in the future, design should be for the more stringent of current and future live loads.

12.3.4 Vibration control

12.3.4.1

Floor structures shall be designed to prevent floor vibration due to walking from exceeding comfort thresholds for all administrative areas and non-critical areas such as lounges, waiting areas, cafeterias, etc.

Note: *Typically a peak acceleration of 0.5% of g (4–8 Hz) for office occupancy is acceptable. Refer to AISC Steel Design Guide Series 11.*

12.3.4.2

General operating rooms and areas with sensitive inpatient bedrooms shall be designed to limit floor vibration to the tactile perception threshold (typically 0.05% of g (4–8 Hz)). Less sensitive inpatient bedrooms may have slightly higher levels of floor vibration; 0.1% of g (4–8 Hz).

12.3.4.3

Floors in spaces with sensitive equipment (e.g., microsurgery or neurosurgery ORs; MRI suites) should be designed to the specific criteria provided by the equipment manufacturer, assuming the most stringent requirements. Where vibration sensitive equipment is supported directly from the floor structure above, the vibration criteria shall also apply to the floor above.

Note: *Refer to AISC Steel Design Guide Series 11.*

12.3.4.4

Rooftop mechanical equipment should be located on a stiff portion of a lightweight roof to avoid resonance problems. If the dead load of the equipment causes the roof structure to deflect more than 6 mm, the roof shall be reinforced.

12.3.4.5

A minimum of 100 mm thick concrete housekeeping pad shall be provided for all mechanical equipment.

Note: *Additional detail can be obtained from the equipment specifications and from consultation with a qualified mechanical engineer.*

12.3.4.6

Floors for mechanical rooms shall have a minimum of 130 mm thick concrete to minimize structural vibration problems.

12.4 Mechanical systems

12.4.1 General

12.4.1.1 Description

These requirements are intended to ensure that the building environment is compatible with the general needs, comfort, and safety of the patients, staff, and visitors.

12.4.1.2 Redundancy

Redundancy shall be provided to maintain HCF operation, and a healthy and safe indoor environment in the event of utility or equipment failure.

Note: *See CSA Z317.1, CAN/CSA-317.2, and CSA Z7396.1 for specific requirements.*

12.4.1.3 Essential electrical systems

Essential equipment and controls shall be connected to the emergency electrical power supply system in accordance with CSA Z32 to ensure continual operation during utility power outages.

12.4.1.4 Equipment access

Design and installation shall allow sufficient space around equipment for easy access, ease of maintenance, and repair and removal of equipment.

12.4.1.5 Sustainability

Environmentally sustainable strategies and innovative technology should be adopted in the design, construction, and operation of mechanical systems to attain high performance over the building lifetime. This includes

a) effective and efficient systems that conserve energy and water resources;
b) a comfortable and healthy indoor environment; and
c) minimum impact on the environment by means of emitting less pollutants and greenhouse gases.

See Clause 4.6.

12.4.1.6 Catastrophic events management

Mechanical systems shall be designed to allow the isolation and independent control of system elements to respond to catastrophic events such as an infectious disease outbreak, hazardous spills, smog, and fires.

Note: *See CAN/CSA-Z317.2 for specific requirements for HVAC systems. Provincial/territorial and national building codes can apply.*

12.4.2 HVAC systems

12.4.2.1

Design and construction of heating, ventilation, and air conditioning systems shall meet the requirements of CAN/CSA-Z317.2 and CAN/CSA-Z317.13.

12.4.2.2

Acoustic controls shall limit noise generated by HVAC systems to acceptable levels as specified in CAN/CSA-Z317.2.

12.4.2.3

Acoustic controls for HVAC systems should avoid over-silencing for spaces such as examination rooms and offices where speech privacy is important.

Note: *The presence of background noise can help to mask conversation from adjacent rooms.*

12.4.3 Plumbing systems

12.4.3.1

Design of plumbing systems shall meet the requirements of CSA Z317.1 and applicable building requirements.

Note: *The National Plumbing Code or other codes can apply.*

12.4.3.2

Potable water supply and distribution systems shall be protected from backflow contamination in accordance with CAN/CSA-B64 Series.

12.4.4 Medical gas systems

12.4.4.1

Design and construction of medical gas systems shall be in accordance with CSA Z7396.1.

12.4.4.2

Design and construction of oxygen concentrator systems for medical gas systems, when used, shall comply with CSA Z7396.1.

12.4.4.3

Medical supply units (i.e., headwalls, articulating arms, and columns with medical gas outlets) shall comply with CSA Z7396.1.

12.4.5 Fire protection

Fire protection systems shall be designed, commissioned, and tested in accordance with

a) NFPA 10 (portable fire extinguishers);
b) NFPA 13 (sprinkler systems);
c) NFPA 14 (standpipe systems); and
d) NFPA 96 (commercial cooking systems).

Notes:

1) *Provincial/territorial and local building codes and bylaws can apply.*
2) *Refer to CAN/CSA-Z317.2 for smoke management requirements.*

12.4.6 Commissioning

12.4.6.1

HVAC, plumbing, fire protection, and building control systems in newly constructed or renovated facilities shall be commissioned in accordance with CSA Z320 and CAN/CSA-Z8001.

12.4.6.2

Medical gas systems shall be commissioned and tested in accordance with CSA Z7396.1.

12.4.7 Pneumatic tube transport systems

12.4.7.1 Description

12.4.7.1.1

Pneumatic tube system applications have evolved from being a non-critical paper handling system to a critical material handling system providing functional and economic efficiencies for a modern HCF. Typical transaction expectations range from 4 to 6 transactions per patient bed per day. The busiest stations are typically laboratory, pharmacy, and emergency.

12.4.7.1.2

Pneumatic tube systems provide the capability to send a carrier with a payload of up to 7 kg from any station to any other station via the shortest route, and without manual intervention. Carriers travel through a network of galvanized steel tube (150 mm standard, 100 mm available) connecting the various components that are located on multiple zones. Zones are arranged to handle the anticipated traffic through routine and peak traffic time periods. Systems safely transport virtually anything that will fit in the carrier including 1000 mL IV bottles or bags, laboratory specimens, whole blood, drugs, surgical instruments, and records. Modern pneumatic tube systems operate 24 h per day at extremely high uptime with minimal maintenance.

12.4.7.1.3

Typical station locations for pneumatic tube transport systems include

a) nursing stations;
b) laboratory;
c) pharmacy;
d) emergency;
e) ICU;
f) CCU;
g) medical records;

h) admitting;
i) blood bank;
j) central stores; and
k) medical device reprocessing.

12.4.7.1.4

Features for include pneumatic tube transport systems can include
a) transaction verification prior to acceptance and delivery;
b) multiple carrier dispatch capability at station;
c) sealed carrier;
d) RFID carrier tracking and monitoring;
e) capability to receive multiple carriers at station;
f) card swipe station access by operator;
g) security transaction selection (controlled carrier delivery);
h) stat transaction selection (priority dispatch);
i) priority assignments programmable for carrier dispatch and receive;
j) carrier arrival indicators at station and also through remote discrete address assignable locations;
k) empty carrier rerouting within the system on a pre-programmed priority basis; and
l) full monitoring of system transactions, operation, diagnostics, and settings through multiple monitors if required, remote connection or connection to the HCF network (useful in laboratory and pharmacy).

12.4.7.2 Safety considerations

To prevent spills from taking place during transport, the design specifications for pneumatic tube transport systems shall specify
a) the materials that will normally be sent through the system;
b) prohibited materials (i.e., materials that cannot be sent in a carrier under any circumstances);
c) packing requirements, including the method of bagging liquids and gels; and
d) the means and equipment needed to clean out system components in the event of a spill.

Note: *Although spills are rare, the HCF should have procedures for cleanup and recovery following a leak or spill (e. g., repeated routing of a clean-out carrier containing an appropriate cleaning solution or manually disconnecting the affected piping section and manually cleaning the section). The HCF should also ensure that staff in departments with a pneumatic tube station are trained in the method of sending and receiving of carriers to other departments.*

12.4.8 Other robotic transportation systems

The HCF should be aware of other robotic transportation systems coming on the market, which include automated guidance vehicles (AGV), drug management systems (DMS), autonomous mobile robots (AMR), and track vehicle systems (TVS). These should be evaluated by the HCF in their respective functional programs with criteria such as capital cost, operational costs, human resource utilization, ergonomics, and safety.

12.5 Electrical systems

12.5.1 General

12.5.1.1 Electrical Standards

Electrical systems shall conform to the following Standards:

a) C22.1, *Canadian Electrical Code, Part I*;
b) CSA Z32;
c) CSA C282; and
d) CSA Z317.5.

12.5.1.2 Sustainability and energy

Electrical systems shall be designed to operate efficiently and effectively while meeting the energy needs of the building. Alternative systems for the generation of electrical power should be considered (e.g., wind, solar, or green power purchase). Equipment and lighting with good energy efficiency ratings should be given preference.

12.5.1.3 Monitoring and metering

Electrical distribution systems whose load-carrying capacity is greater than 250 kVA shall be designed to facilitate the installation of a means to monitor separately the energy consumption of electrical power feeders for

a) hard-wired lighting;
b) heating, ventilating, or air-conditioning systems;
c) service water heating;
d) elevators; and
e) special equipment or systems of more than 20 kW, including
    i) computer rooms;
    ii) kitchens; and
    iii) printing equipment.

12.5.1.4 Continuing operations

Back-up emergency systems, UPS, and transformer redundancy shall be provided to maintain HCF operations in accordance with CSA Z32.

12.5.1.5 Reliability

12.5.1.5.1

Redundant power supplies and redundant generators with adequate fuel supplies shall be provided in accordance with CSA Z32 and CSA C282.

12.5.1.5.2

Where redundancy of power supplies is required by CSA Z32 and CSA C282, or as stipulated in Clause 12.6.2, redundant incoming telecommunication services shall be implemented where practicable.

12.5.1.6 Equipment location

Equipment shall be located as follows:

a) Electrical distribution equipment located within the building shall be in a secure, dedicated electrical room that does not contain unrelated equipment or services. In particular, the room shall not contain
   i) natural gas lines;
   ii) fuel lines;
   iii) steam lines;
   iv) storm or sewer mains; or
   v) water mains, other than sprinkler system piping.

   Note: *The intent is to minimize the risk of an electrical power interruption due to a failure in an unrelated system. Fire within the electrical room is the primary concern since it can leave the health care facility entirely without power, hence no unrelated equipment or services are permitted in the room.*

b) Equipment shall be suitably protected from the discharge of fluids from the sprinkler system as well as leakage from the sprinkler piping, drain lines, water lines, etc.

   Note: *It is understood that some services will be required, such as sprinklers and drains from the floor above. To protect against leakage, the equipment should be provided with a suitable enclosure. CSA type 3R enclosures are suitable for this purpose.*

c) The equipment rooms shall provide sufficient clearance and access routes, access panels, etc., to allow for the installation, removal, and replacement of the equipment. The electrical distribution equipment that the above applies to includes
   i) high voltage switchgear;
   ii) engine generators;
   iii) power transformers;
   iv) distribution transformers of 150 kVA and larger;
   v) low voltage switchgear;
   vi) automatic transfer switches;
   vii) uninterruptible power supplies;
   viii) distribution power panels;
   ix) bus duct risers;
   x) fire alarm panels; and
   xi) any other equipment, the failure of which could leave the health care facility ineffective.

d) Panel boards shall be located in electrical rooms or closets rather than on public/patient corridor walls.

e) Rooms with transformers shall be located away from acoustically sensitive or electromagnetically sensitive areas.

f) Clear access shall be provided to electrical rooms at floor level or by means of full stairs with hoisting provisions.

g) Local UPS shall be provided to serve individual loads or groups of loads in a common area (e.g., laboratories), where required.

   Note: *Battery requirements for UPS can be minimized by feeding the unit from the emergency power system. UPS batteries should be sized to maintain continuity until emergency power systems take effect.*

h) Electrical rooms shall be stacked vertically in multi-story facilities to facilitate distribution.

i) The design should consider locating communications and other systems away from electrical rooms.

   Note: *The intent is to minimize the risk of an electrical power interruption due to a failure in an unrelated system, e.g., fluid distribution or process equipment.*

j) Mitigation strategies should be considered relative to flooding from above and from natural events. Equipment rooms shall not be located below grade, nor in any location that might be subject to flooding from natural events or from equipment or piping failures within the building.
Note: *On a sloped site, a floor area that is at grade level at any point and the grade at that point slopes away from the building so as not to permit flooding, is not considered to be below grade for the purposes of this Clause.*

12.5.2 Lighting

12.5.2.1 General

Lighting systems shall be designed to meet the visual, ergonomic, safety, and aesthetic needs of the building occupants in both general and specific applications, in accordance with CSA Z317.5.

The design and location of light fixtures should be such that they can be easily maintained without endangering patients, clinical staff, or HCF engineering staff.
Note: *Light fixtures installed over stairwells can be difficult to reach safely.*

Lighting levels shall be in accordance with CSA Z317.5.

12.5.2.2 Lighting controls

12.5.2.2.1

The nature of lighting and lighting control should be reviewed to establish level requirements, the number and type of sources, and the method and location of controls for convenient and easy operation. Patients shall be provided with control of the lighting environment in their rooms where applicable.

12.5.2.2.2

Patient corridors shall be provided with controls.

12.5.2.2.3

Lighting at nurses' stations shall be provided and have adjustable lighting controls with distinct levels to accommodate day, evening, and late night activities, time of day, and activities. Low ambient lighting levels shall be designed with task lighting for night shift.

12.5.2.2.4

Natural light, if available, should be provided with effective shading controls. If telehealth services are incorporated, black-out shades shall be provided.

12.5.2.2.5

Proper illumination techniques shall be employed to ensure accurate skin colour. Light sources to be in accordance with CSA Z317.5.

12.5.3 Fire alarm

The fire alarm system shall be
a) installed in compliance with CAN/ULC-S524; and
b) verified to CAN/ULC-S537.

12.5.4 Nurse call systems

12.5.4.1
The nurse call system shall be designed to fit the functional requirements of the HCF. The simplest system that can satisfy the requirements of the HCF shall be provided. Integration with wireless staff communication devices shall be a key component of the nurse call system.

12.5.4.2
Wiring in conduit or in adequately sized accessible trays shall be provided to facilitate system upgrades or modifications.

12.5.4.3
Nurse call systems shall be provided with non-volatile memory.

12.5.4.4
The nurse call system shall be designed to be a campus-wide solution with similar functionality and appearance throughout all areas of the facility. Using different nurse call systems in the same facility should not be allowed for ease of use, administration, and maintenance.

12.5.5 Transformer noise and vibration
Transformers shall not be located within ceiling spaces. Indoor transformers should be dry type. Where not internally integral to the transformer itself, vibration isolators shall be provided for transformers located near occupied spaces. Flexible conduit shall be used for the connection to the transformer.

12.5.6 Device back boxes
In patient care areas, architectural input shall be obtained to determine the appropriate STC level and mitigation strategy.

Note: *To reduce the transmission of noise and maintain fire rating integrity of walls in patient care areas, noise transmission (even in back-to-back box configurations) can be mitigated with the use of fire-rated mastic materials or boxes designed to mitigate noise transmission. Where possible, avoiding back-to-back configurations on its own might meet this requirement.*

12.5.7 Wiring methods

12.5.7.1
All branch circuit wiring in clinical areas shall be installed in metallic conduit in accordance with Section 24 of the *Canadian Electrical Code, Part I*.

12.5.7.2
Conduits shall not be installed in or below structural slabs or slabs on grade serving clinical areas in the HCF.

12.5.7.3
Where cable tray systems are used for the distribution of low tension cabling, these cable trays shall be confined to corridors or dedicated service spaces only. Wiring to patient care areas, procedure areas, or clinical spaces shall be installed in conduit from the cable tray.

12.6 Information technology

12.6.1 General

12.6.1.1

Information technology systems shall be provided to assist staff, patients, and the public with the dissemination of all forms of information. Information technology systems shall be designed to manage information in a timely, accurate fashion.

Note: *Information transfer is an essential part of providing care in a health care centre. The latest proven technology should always be considered for transferring, securing, and storing information.*

12.6.1.2

The HCF shall determine its communications and information transfer and storage needs during the design stage. All media types shall be accommodated in a HCF, including data, waveforms, images, video, voice, and text.

12.6.1.3

The information technology planning process shall specify the number and type of wireless systems that will be used, and shall ensure that these systems have the necessary compatibility (i.e., will allow communication between systems as required by the functional program) and will not interfere with each other.

12.6.1.4

Information technology systems shall be designed to preserve confidentiality, privacy, and security of information to maintain the trust between the public and the health care provider.

Note: *In Canada, provincial/territorial laws apply to the storage and dissemination of personal information (e.g., the Government of Ontario's Freedom of Information and Protection of Privacy Act).*

12.6.1.5

The latest IEEE, EIA/TIA, and CSA standards shall be used when designing information technology systems. The systems design should include a high level of physical and logical redundancy that promotes continuity of service even if individual components fail.

12.6.1.6

Information and communications systems shall be compatible and shall be able to share information appropriate to the functioning of each system.

Note: *The convergence of technology has resulted in many systems being able to share information on a single network or between networks. Integrated systems can increase efficiency and function, resulting in better patient care.*

12.6.1.7

The IT systems and infrastructure shall be designed to accommodate electronic health records systems.

Note: *The EHR will be a cornerstone of modern health care IT systems.*

12.6.1.8

The information technology infrastructure shall be designed to accommodate the specific needs of the

HCF. Planning for the information technology infrastructure shall include the following elements as appropriate to the functional program of the HCF:

a) general communications systems, including
   i) telephone (voice over internet protocol, internet phone service (VoIP), or analog);
   ii) cellular networks;
   iii) television;
   iv) audio conferencing;
   v) wireless networks for voice/data/video; and
   vi) education systems for staff, and for patients and their families or caregivers;
b) clinical systems, including those for
   i) patient monitoring;
   ii) imaging (picture archiving C system or PACS);
   iii) clinical equipment and networks;
   iv) pharmacy dispensing;
   v) nurse call;
   vi) video conferencing and associated telehealth, telepathology, and e-medicine systems;
   vii) patient bedside portal; and
   viii) telemetry/patient monitoring.
c) administrative systems, including
   i) patient registration; and
   ii) financial and administration networks;
d) security systems, including
   i) access control and video surveillance;
   ii) patient wandering, infant protection, and staff locating;
   iii) staff emergency assistance alarm; and
   iv) asset tracking;

   Note: *The systems in Items ii), iii), and iv) can allow for either real time locating in areas and/or secured perimeters to provide protection against theft/misplacement or unauthorized wandering. These systems can be combined into a centralized real time locating system that provides all or part of these functions.*
e) building systems, including
   i) building automation systems;
   ii) computerized maintenance management systems; and
   iii) energy monitoring systems; and
f) logistics.

Note: *An information technology professional should design the network that supports the different systems that will reside on the network. The physical cabling should be designed by a RCDD.*

12.6.1.9

If VoIP is used, land lines shall be maintained in critical areas where communication has to be maintained in the event of network or Internet failures.

12.6.2 Structured cabling

12.6.2.1

Structured cabling systems, including the location of telecommunication rooms (TRs), pathways, and raceways, shall be designed in accordance with TIA/EIA-568-B.1, TIA/EIA-568-B.2, TIA/EIA-568-B.3, TIA/EIA-569-B, and TIA-606-A (or latest revisions) for communications systems administration.

12.6.2.2
Cabling systems shall be designed, selected, and installed in accordance with the functional program requirements for the HCF's information technology and communications systems. Where possible, it should also accommodate technological advances, future expansion, and changing requirements by the HCF. Shielded cabling should be used for locations with electromagnetic interference (e.g., MRI facility).

12.6.2.3
For major HCFs (those over 20 000 m^2) two utility service entrances should be provided to the building (or group of buildings if a campus arrangement is used). Redundant pathways and redundant service providers should be considered.

12.6.2.4
For HCFs that contain data centres that serve more than just the HCF, redundant utility services and redundant physical pathways shall be provided.

12.6.2.5
For HCFs, in a campus arrangement (i.e., a group of buildings) redundant physical and logical services shall be run between all major buildings so that the loss of one service does not affect the operation of the building. The service routing for the two services shall be designed to facilitate this.

12.6.2.6
The service entry conduit shall be protected with concrete encasement or equivalent protection.

12.6.2.7
Service entrance rooms shall be located to allow easy access by the service providers.

12.6.2.8
Power supplies to entrance facilities, data centres, and telecommunication rooms shall be from the HCF's emergency power system. Uninterruptable power shall be provided in all telecommunication rooms for all critical equipment, and it should be considered for all equipment.

12.6.2.9
TRs shall be located such that no horizontal cable length exceeds the maximum distances specified in the TIA/EIA-568-B standards. All horizontal cabling should be designed to terminate on the same level as the telecommunication outlet.

12.6.2.10
TRs shall be aligned floor to floor to allow vertical pathways to line up with minimal offsets.

12.6.2.11
All TRs shall have environmental controls for temperature. Humidity shall be maintained within a range of 20% RH to 60% RH.

The initial pathways and raceways shall be designed to be expandable for future growth.

12.6.2.12

Cable trays shall be the main horizontal pathways to distribute horizontal cabling through the corridors of the HCF where the corridor ceilings are fully accessible. Conduit, with equal cable capacity to the cable tray, and appropriately located junction boxes shall be provided in accessible corridor ceiling spaces. These main horizontal pathways shall continue to the last space served. Cable tray routes should be coordinated with all disciplines locating services in the ceiling space so as to ensure that access to the cable tray is maintained and integrity of the cable tray is ensured (e.g., that no sections are cut to access services above).

12.6.2.13

Initial pathways and raceways shall be designed for a maximum fill of 50%, and be expandable for future growth.

12.6.2.14

Wiring to patient, procedure, or similar clinical spaces shall be installed in conduit from the cable tray.

12.6.2.15

Cable management software and electronic drawing systems should be used to manage the structured cabling plant. An intelligent patching system should be used to manage all aspects of the cabling plant.

12.6.2.16

12.6.2.16.1

TRs should be designed such that no sources of water or drains route through the TR. If water is required for cooling, the water pipes should be designed and laid out as far away from electronic equipment as possible (minimum 1 m and not above).

12.6.2.16.2

TR rooms shall not be located below washrooms, shower rooms, or other sources of water unless a mitigation strategy is used to protect the TR room from the incursion of water.

12.6.2.16.3

Conduits, ducts, pipes, and other services not associated with the TR shall not be installed inside these rooms unless a mitigation strategy is used to protect the room from the incursion of water.

12.6.2.16.4

If water is required for cooling, the water pipes should be designed and laid out as far away from electronic equipment as possible (minimum 1 m and not above).

12.6.2.17

Fan coil units or other cooling systems should not be located in the TRs.

12.6.3 Data centre

12.6.3.1

If the HCF contains a data centre, the data centre and associated physical infrastructure shall be designed in accordance with applicable requirements of TIA-942, ANSI/TIA-942-1, and TIA-942-2 and

ANSI/BICSI 002 (and most up to date versions). The data centre for a HCF should be classified as T1A tier II or ANSI/BICSI F2, and for a large data centre serving multiple buildings classified as T1A tier III or ANSI/BICSI F3.

12.6.3.2

Data centres should be designed such that no sources of water or drains route through the data centre. Any valves required for cooling units should be located in another room outside the data centre or in an enclosed and sealed cabinet.

12.6.4 Wireless

12.6.4.1

The wireless LAN system shall use the latest proven technology. Wireless data security encryption shall be used on any wireless communication system to protect privacy.

12.6.4.2

The selection of all wireless systems should take into account the following considerations:

a) scalability;
b) compatibility;
c) bandwidth;
d) standardization;
e) security;
f) potential interference; and
g) flexibility.

12.6.4.3

Wireless staff-to-staff communication systems using wireless devices or wireless phones should be provided.

Note: *HCF administrators should consider the use of wireless devices as part of their delivery of care to increase efficiency or staff and improve the patient experience.*

12.6.4.4

Wireless systems shall run on the structured cabling plant.

12.6.4.5

The wireless staff communication system should be integrated with the PBX, nurse call system, and the security system. The wireless staff communication system should be integrated with the electronic health record system, provided confidentiality can be maintained.

12.6.4.6

The wireless system design shall take into account other biomedical wireless system and interference with these systems shall be avoided.

12.6.4.7

Quality of service (QOS) shall be incorporated for voice systems.

12.6.4.8
A wireless survey shall be performed to accurately record coverage levels for the wireless system. The survey should include
a) a predictive survey prior to any installation of system;
b) an active survey at completion of project and prior to owner move in; and
c) an active survey three months post-owner move in.

12.6.4.9
Special considerations and design are required for wireless service in elevators, stairwells, mechanical space, parking structures (indoors and outdoors), and large areas of gathering such as auditoriums and cafeterias.

12.6.4.10
The wireless system shall be the same communications protocol throughout the entire facility to ensure coverage and roaming from one area of the facility to another.

12.6.5 Network equipment

12.6.5.1
Network equipment shall be consistent with the established equipment standards of the day and allow all industry protocols, software, and media types to reside on it.

12.6.5.2
Network equipment shall comply with the IEEE 802.1 series of Standards and IEEE 802.3.

12.6.5.3
The network shall be designed by a person with experience and qualifications in network design.

12.6.5.4
The network shall be configured to be fault-tolerant, having two core switches. There shall be two pathways to the edge distribution switches.

12.6.5.5
Network equipment shall be powered by uninterruptible power supplies fed from the emergency power distribution system.

12.6.5.6
Network equipment shall be located in the data centre and telecommunication rooms.

12.6.5.7
Data security measures, such as firewalls, encryption, and authentication services, shall be deployed on the network to protect unauthorized access to the data.

12.6.5.8
The network system should be compatible throughout the entire facility to ensure performance, administration, and maintenance of the system.

12.6.6 Real time locating system (RTLS)

12.6.6.1
The RTLS should be included in the HCF for tracking of assets and people throughout the facility. Where possible, staff emergency assistance alarms, patient wandering, and infant protection should be integrated into the RTLS to allow for determining the location of the respective device/alarm.

12.6.6.2
The RTLS system should be integrated with the security system and hospital information system.

12.7 Security systems

12.7.1 General

12.7.1.1
The HCF design shall include the physical elements necessary to support the HCF's overall security program.

12.7.1.2
The security systems that should be considered in a HCF are
a) access control;
b) video surveillance;
c) intrusion detection;
d) staff emergency assistance asset protection;
e) guard tour;
f) incident reporting; and
g) lighting.

12.7.1.3
Security systems should be integrated across the HCF, and should operate over the HCF's network.

12.7.1.4
Security systems shall be compatible throughout the entire facility to ensure performance, administration, and maintenance of the system.

12.7.2 Access control system

12.7.2.1
HCFs shall have an access control system that allows authorized personnel access into controlled department and prevents access to unauthorized personnel.

Note: *Controlling traffic towards specific doors, such as the main entrance and emergency department, allows the HCF to better guide patients and public to their desired location.*

A comprehensive threat, risk, and vulnerability assessment indicates where access control devices should be placed. The following areas and site elements shall be evaluated to determine the need for access control:
a) pharmacy;
b) emergency program;

c) maternal and infant care;
d) ICU/CCU;
e) surgical suite;
f) staff facilities;
g) loading dock;
h) staff entrances;
i) parking;
j) laboratory;
k) medical records;
l) MDRD;
m) psychiatry;
n) palliative care;
o) electrical equipment rooms;
p) generator rooms;
q) mechanical equipment rooms;
r) IT equipment rooms;
s) service entrance rooms
t) on-site retail locations, including pharmacies and stores; and
u) prosthetics room.

Note: *Additional guidance and requirements on security are addressed in Clause 7.7.*

12.7.2.2

The access control system shall be integrated with other security systems to provide alarm annunciation and control.

12.7.2.3

The access control system shall use a photo identifications system for badging needs.

12.7.2.4

Where required, the access control system shall connect to the fire alarm system to release locked doors.

12.7.3 Video surveillance

12.7.3.1

The HCF shall have a video surveillance system (VSS).

Notes:

1) *The VSS comprises cameras, recording systems, and display workstations.*
2) *These systems provide authorized personnel with monitoring to control secure areas and also can be an investigative tool to follow up on security incidents.*
3) *The threat, risk, and vulnerability assessment identifies where cameras are needed, but the following public locations will likely need cameras:*
   a) *parking areas;*
   b) *exterior of the building and grounds;*
   c) *emergency department;*
   d) *maternity;*
   e) *surgical suite;*
   f) *psychiatry;*
   g) *areas where cash is used;*

h) *pharmacy;*
i) *medical records;*
j) *diagnostic imaging;*
k) *loading dock; and*
l) *shipping and receiving.*

12.7.3.2
The VSS shall produce a video image of high enough quality to be acceptable as evidence in forensic investigations.

12.7.3.3
The VSS shall be connected through the building network.

12.7.3.4
Due consideration for privacy concerns shall be followed when locating cameras.

12.7.3.5
The VSS shall be integrated with the other security systems for automatic camera call up and recording to ensure the security incident is captured.

12.7.4 Intrusion detection

12.7.4.1
Intrusion detection systems shall be installed in areas where protection of physical or digital assets is critical.

12.7.4.2
Intrusion detection systems should be installed in areas of the HCF that close after hours.

12.7.4.3
The intrusion detection system shall meet recognized standards for security systems.

12.7.4.4
The intrusion detection system shall integrate with other security systems for alarm recording and incident reporting purposes.

12.7.5 Staff emergency assistance alarm systems

12.7.5.1
A wired or wireless staff emergency assistance alarm system shall be provided in all areas where there is a danger to staff from the patients or the public. The location of the emergency assistance alarm system will be identified in the threat, risk, and vulnerability assessment. At a minimum, alarm points should be provided at the following locations:
a) parking;
b) emergency department;
c) areas where cash is handled;
d) pharmacy;
e) maternity;

f) psychiatry;
g) palliative care; and
h) reception areas of departments.

12.7.5.2

The system shall be able to identify where the incident is occurring to allow authorized personnel to respond.

12.7.5.3

The alarm system shall integrate with other security systems for alarm recording and incident reporting purposes.

12.7.6 Patient wandering

12.7.6.1

Patient wandering systems shall be provided in all departments where patients could be at risk of injury if they leave the department unescorted. Dementia wards, palliative care, assisted living, and psychiatry are all examples of where this might be needed.

Note: *It is important to consider all exiting points when designing for these systems, such as doors, elevators, balconies, and windows if they are operable. Overrides on these exits are needed to allow staff to escort the patient out of the area of protection as needed.*

12.7.6.2

The system shall alarm both locally and on the integrated system.

Note: *The local alarm allows staff to respond quickly to an incident.*

12.7.7 Infant protection

Maternity, NICU, and pediatric wards shall have infant protection systems that alarm when a newborn leaves the department without the appropriate escort.

12.7.8 Other systems

Other systems, such as electronic incident reporting, public duress alarms, RFID asset tracking, order inventory control, guard tour, and parking control systems, should be addressed in the threat, risk, and vulnerability assessment report and installed if recommended (see Clause 7.7.1).

Annex A (informative)
Bibliography

Note: *This Annex is not a mandatory part of the Standard.*

Accessibility
Access — A Guide to Accessible Design, prepared by Universal Design Institute, 2000

Accessibility for Ontarians with Disabilities Act (AODA), 2001

Clearing Our Path, prepared by the CNIB

Standards for Barrier-free Design, prepared by the Government of Ontario

Toolkit for Annual Accessibility Planning, prepared by the Ontario Hospital Association

Environmental management, site assessment, and life cycle analysis
CSA Z768-01 (R2016)
Phase I environmental site assessment

CAN/CSA-Z769-00 (R2013)
Phase II environmental site assessment

CSA Z773-03 (R2013)
Environmental compliance auditing

ISO 14015:2001
Environmental management — Environmental assessment of sites and organizations (EASO)

ISO 14040:2006
Environmental management — Life cycle assessment — Principles and framework

ISO 14044:2006
Environmental management — Life cycle assessment — Requirements and guidelines

ISO 19011:2015
Guidelines for auditing management systems

ISO/TR 14047:2012
Environmental management — Life cycle impact assessment — Illustrative examples on how to apply ISO 14044 to impact assessment situations

ISO/TS 14048:2002
Environmental management — Life cycle assessment — Data documentation format

ISO/TR 14049:2012
Environmental management — Life cycle assessment — Illustrative examples on how to apply ISO 14044 to goal and scope definition and inventory analysis

Additional resources
The Performance Guide, Québec Ministry of Health and Human Services — UHC (available in both French and English)
www.construction3chu.msss.gouv.qc.ca

HVAC
ANSI/ASHRAE 55-2017
Thermal Environmental Conditions for Human Occupancy

ANSI/ASHRAE 62.1-2016
Ventilation for Acceptable Indoor Air Quality

ANSI/ASHRAE 129-1997 (R2002)
Measuring Air Change Effectiveness

Quality management and safety
CSA Z7000-18
Standard for the design of high-performance green buildings

Sustainability
ANSI/ASHRA/USGBC/IES 189.1-2014
Standard for the Design of High-Performance Green Buildings

ANSI/ASHRAE/ASHE 189.3-2017
Design, Construction, and Operation of Sustainable High-Performance Health Care Facilities

ASHRAE 110-2016
Method of Testing Performance of Laboratory Fume Hoods

Annex B (informative)
HCF examples by class

Note: *This Annex is not a mandatory part of this Standard.*

B.1

The HCF class is used to specify the levels of protection, redundancy, and functionality of spaces within any building. In many cases, the entire building may be classed as a single type of HCF. As an example, a community hospital with typical hospital services (emergency department, minor surgery and support, inpatient units, etc.) may be deemed to be a Class A-2 HCF. However, it is possible that a single building might house multiple HCF classes. As an example, a surgical suite installed on a portion of a floor of a multi-storey medical office building would house multiple HCF classes (i.e., the area housing the surgical suite serving an acute care function would be classed as a HCF Class A-2, where the remainder of the building would be classed as a HCF Class C). See Table B.1.

HCF classes should not be confused with the concept of occupancies as used in building codes. Occupancies as determined under a building code can influence various life safety, exit, and egress requirements independently of HCF class determination. However, the impact of higher-risk functions within any building should be considered when determining the requirements to be applied under a building code.

Table B.1
HCF examples by class
(See Clause B.1.)

Health care facility	Examples
Class A-1	***Class A-1 HCFs providing inpatient care (i.e., patients receive treatment and stay in the facility for more than 24 h):***
	Large acute care/tertiary care hospitals (typically more than 350 beds)
	Note: *This group can include academic teaching centres/hospitals, as well has hospitals providing specialized services such as transplantation hospitals and cardiac care centres.*
	Trauma centres
	Emergency care facilities
	Some rural hospitals
	HCFs providing outpatient care (i.e., patients stay in the centre for less than 24 h and return to their home after treatment):
	Ambulatory clinic within a Class A-1 hospital
	Note: *Ambulatory facilities are generally classed as C-1 or C2, but if an ambulatory facility is an integral part of a Class A health care facility, with similar expectations for continuity of service, it could be classed in the same way as the parent institution.*
Class A-2	***Class A-2 HCFs providing inpatient care:***

(Continued)

Table B.1 (Continued)

Health care facility	Examples
	General acute care hospitals (no fewer than 100 beds; typically less than 350 beds)
	Tertiary care hospitals (i.e., a facility that provides a full range of services including specialty and subspecialty surgery, medicine, diagnostics and emergency care, usually on a referral basis)
	Regional secondary care hospitals (i.e., a community-based facility that provides a limited scope of surgery, medicine, diagnostics and emergency care.)
	Accident and emergency treatment centres
	Cancer centres (with inpatient beds)
	Surgery centres or independent health facility providing specialty inpatient surgery (more than 100 beds)
	Forensic psychiatric centres
	HCFs providing outpatient care:
	Health centres in a rural area, which performs routine surgical procedures
	Medical clinics or surgical clinics with overnight stay or observation
	Stand-alone laboratory facilities
	Children's treatment centres that provide overnight stay or observation
Class B	***Class B HCFs providing inpatient care:***
	Convalescent hospitals
	Chronic care hospitals
	Continuing care hospitals
	Alzheimer's (and other dementias) centre - inpatients
	Nursing homes
	Special care homes
	Specialty rehabilitation centres; including brain injury; spinal cord; and stroke
	Children's treatment centres – ongoing care
	Long-term care facilities
	Long-term nursing care beds
	Auxiliary hospital
	Private nursing homes
	Personal care home
	Assisted-living facilities
	Psychiatric hospitals/mental health facilities
	Forensic facilities

(Continued)

Table B.1 (Continued)

Health care facility	Examples
	Rehabilitation facilities
	Addiction treatment centres
	Hospice care facilities
	Group homes
	Chronic care facilities
Class C-1	***Class C-1 HCFs providing inpatient care:***
	Rural area access hospitals – performing routine medical procedures and (i.e., no surgery, or surgery only in emergency)
	Independent health facilities (IHF) providing overnight stay or observation (using anaesthesia; providing invasive surgery)
	Class C-1 HCFs providing outpatient care:
	Outpatient clinics and/or IHFs, including specialty clinics (using sedation or anaesthetic for procedures)
	Physicians' offices or IHFs that provide treatments involving sedation or anaesthetic (e.g., endoscopy, minor surgery)
	Surgery centres or IHFs – arthroscopic surgery (sedation)
	Endoscopy centres
	Stand-alone dialysis clinics (if there are no others in the area, i.e., patients have no alternative if the clinic is out of service)
	Chemotherapy centres
	Intravenous therapy and drug-related treatment centres
	Birthing centres
	Vitro fertilization centres
	Hyperbaric centres
	Withdrawal management center (patients undergoing acute substance withdrawal)
	Dental/oral surgery practices (using sedation or anaesthetic)
	Diagnostic imaging centres or IHFs (using sedation or some invasive procedures)
	Mental health clinic or treatment centres (with treatment spaces)
	Cosmetic surgical offices or IHFs (using sedation or anaesthetic)
	Eye surgery centres (using sedation or anaesthetic)
	Children's treatment centres
C-2	***Class C-2 HCFs providing inpatient care:***
	Note: *Although Class C-2 generally applies to ambulatory care, this classification can include residential facilities (e.g., group homes and privately-managed*

(Continued)

Table B.1 (Continued)

Health care facility	Examples
	residences) where occasional medical care is provided. Depending on the patient population and the level of service, the classification might only apply to a clinic within the HCF.
	Lodging houses, group homes, or supportive housing with medical services
	Children's residences
	Withdrawal management centres
	Class C-2 HCFs providing outpatient care:
	General dental offices performing dental extractions (local anesthetic only)
	Laser eye clinics (using sedation)
	Primary care outpatient clinics, including specialty clinics (local anaesthetic only)
	General dental offices
	Stand-alone dialysis clinics (if there are others in the area as backup)
	General physician offices (with invasive treatment spaces, but no sedation/ anaesthesia)
	Diagnostic imaging centres (no sedation or invasive procedures)
	Portable diagnostic imaging trailers (MRI, angiography)
	Ambulatory clinics, walk-in health clinics, nurse-practitioner clinics
	Urgent care centres (CTAS levels 4 and 5)
	Mental health and counseling (no treatment spaces)
	Withdrawal management center (medically stable patients)
	Physiotherapy centres
	Occupational therapy centres
	Speech language pathology centres
	Audiology testing centres
	Pediatric clinics (without treatment spaces)
	Public health clinics
	Adult day care centres
	Senior's wellness centres
	Alzheimer's (and other dementias) centres - outpatients

Notes:

1) *In some cases, a single building can house several of the functions listed in this Table. In such cases, areas within the building should be logically grouped to design appropriate air handling. Each group within the building should use the most stringent requirements within that zone. An example of such would be a nursing home with a rural area access health centre incorporated.*

(Continued)

Table B.1 (Concluded)

2) *The class of facility depends on the functions being provided in that facility. For example, a lab could be a small blood/specimen collection area, which would be classified as a Class C-2 facility, or it could be a "stat" and regional testing centre in an office building, which would be classified as Class C-1. A diagnostic imaging (DI) centre could be providing invasive DI treatments (angiography), which would be classified as Class C-1, or simply performing minor ultrasound procedures, which would be classified as a Class C-2 facility.*
3) *Examples of structures that do not meet the definition of a HCF include structures such as parkades, tunnels, cooling towers, staff residences, helicopter landing pads, etc.*

Annex C (informative)
Site assessment checklist

Note: *This Annex is not a mandatory part of this Standard.*

C.1

The following (Table C.1) is a checklist of the factors that can be involved in evaluating a site. Although lengthy, this list is not all-inclusive; new factors are added from time to time. Information is usually collected only for those items that are pertinent to the project.

Table C.1
Site assessment checklist
(See Clause C.1.)

Physical factors
Climate
A. Prevailing winds
1. Direction
2. Maximum, minimum, and average velocities
3. Special forces (e.g., tornadoes, hurricanes)
B. Solar orientation
1. Sun angles
2. Days of sunlight
3. Cloud cover
4. Shading of (or from) adjacent structures, natural features, and vegetation
C. Temperature
1. Ranges of variation
2. Maximums and minimums
D. Humidity
1. Ranges of variation
2. Maximums and minimums
E. Precipitation
1. Peak period totals
2. Annual and seasonal totals

(Continued)

Table C.1 (Continued)

Physical factors

Topography

A. Legal property description, including limits of property, easement, rights of way, and north indication

B. Topography maps and aerial photos

1. Contours and spot elevations
2. Slopes: percentage, aspect, orientation
3. Escarpment
4. Erosion channels
5. Extent, location, and general configuration of rocks, ledges, outcrops, ridges, drainage lines, and other unique features
6. Visual characteristics
7. Potential problem areas during construction: siltation, erosion, etc.

C. Analysis of physical features, including major focal and vantage points and their relationships within, into, and out from the site

D. Existing access and circulation

1. Vehicular
2. Pedestrian

E. Vegetation

F. Existing water bodies

1. Location, size, depth, direction of flow
2. Water quality: clean, polluted, anaerobic conditions, etc.
3. Use: seasonal, year-round
4. Wetlands: ecological features
5. Variations: expected water levels, tides, wave action
6. Coastal features

G. Drainage canals: rivers, streams, marshes, lakes, ponds, etc.

1. Natural and built
2. Alignments and gradients
3. Pattern and direction

(Continued)

Table C.1 (Concluded)

Physical factors
H. Existing waterway easements
1. Surface
2. Sub-surface
I. Surface drainage
1. Patterns on and off the site (location of streams and washes)
2. Proximity to floodplains:
(a) Maximum flood level
(b) Frequently flooded areas
3. Local watershed areas, amount of runoff collected, and location of outfalls
4. Swampy and concave areas of land without positive drainage and other obstacles that can interrupt or obstruct natural surface drainage
5. Potential areas for impoundments, detention/retention ponds
J. Unique site features
Geotechnical/soils
A. Basic surface soil type: sand, clay, silt, rock, shale, gravel loam, limestone, etc.
B. Rock and soil type: character/formation and origin
1. Geologic formation process and parent material
2. Inclination
3. Bearing capacity
C. Bedrock
1. Depth to bedrock
2. Bedrock classification
D. Seismic conditions
E. Environmental hazards
Utilities
A. Potable water
B. Electricity
C. Gas
D. Telephone

(Continued)

Table C.1 (Continued)

Physical factors
E. Cable television
F. Sanitary sewer service
G. Storm drainage (surface, sub-surface)
H. Fire protection
Immediate surroundings
A. Neighbourhood structures: buildings, satellite dishes, etc.
B. Shading and solar access
C. Noise from streets, emergency services, aircraft, etc.
D. Odours
E. Views and vistas
General services
A. Fire and police protection
B. Trash/refuse removal services
C. Snow removal, including on-site storage
Cultural factors
Site history
A. Former site uses
1. Hazardous dumping
2. Landfill
3. Old foundations
4. Archaeological grounds
B. History of existing structures
1. Historic worth
2. Affiliations
3. Outline
4. Location
5. Floor elevations
6. Type
7. Condition

(Continued)

Table C.1 (Continued)

Cultural factors
8. Use or service
Land use, ownership, and control
A. Present zoning of site and adjacent property
B. Adjacent (surrounding) land uses
1. Present
2. Projected
3. Probable effects on the development of this site
C. Type of land ownership
D. Function and pattern of land use: public domain, farm type, grazing, urbanized
1. Present
2. Former
E. Location, type, and size of pertinent community services
1. Schools and churches
2. Shopping centres
3. Parks
4. Municipal services
5. Recreational facilities
6. Bank
7. Food services
8. Health services
9. Access to highways, public transportation
Economic value
A. Political jurisdictions and land costs
B. Accepted "territories"
C. Future potential
D. Size of surrounding lots and approximate price ranges

(Continued)

Table C.1 (Continued)

Regulatory factors
Zoning codes
A. Permitted uses
1. By variance
2. By special use permits
3. Accessory structures
B. Minimum site area requirements
C. Building height limits
D. Yard (setback) requirements
E. Lot coverage
1. Floor area ratio
2. Percentage of coverage
3. Open space requirements
F. Off-street parking requirements
G. Landscaping requirements
H. Sign requirements
Sub-division, site plan review, and other local requirements
A. Lot requirement
1. Size
2. Configuration
3. Setbacks and coverage
B. Street requirements
1. Widths
2. Geometry: grades, curves
3. Curbs and curb cuts
4. Road construction standards
5. Placement of utilities
6. Dead-end streets
7. Intersection geometry

(Continued)

Table C.1 (Continued)

Regulatory factors
8. Sidewalks
9. Names
C. Drainage requirements
1. Removal of spring and surface water
2. Stream courses
3. Land subject to flooding
4. Detention/retention ponds
D. Parks
1. Open space requirements
2. Park and playground requirements
3. Screening from adjacent uses
Environmental regulations
A. Water, sewer, recycling, solid waste disposal
B. Clean air requirements
C. Soil conservation
D. Protected areas, wetlands, floodplains, coastal zones, wild and scenic areas
E. Fish and wildlife protection
F. Protection of archaeological resources
Other codes and requirements
A. Historic preservation and landmarks
B. Architectural (design) controls
C. Special districts
D. Miscellaneous (e.g., mobile homes, billboards, noise)

(Continued)

Table C.1 (Concluded)

Regulatory factors
E. Site-related items in building codes
1. Building separation
2. Parking and access for persons with disabilities
3. Service and emergency vehicle access and parking
F. Building-related items in safety codes
1. Asbestos-containing materials
2. Mercury
3. Lead
4. Confined spaces
5. Fall protection

Source: *This checklist is adapted from the RAIC Canadian Handbook of Practice for Architects (Vol. 2, Chapter 2.3.4).*

Annex D (informative)
Key space requirements and recommendations — Special-purpose spaces and rooms

Note: *This Annex is not a mandatory part of this Standard, but is written in mandatory language so it can be used in room specifications if needed.*

D.1

Table D.1 addresses rooms or spaces that could be needed in certain HCFs. Inclusion in this Table does not imply that these rooms or spaces are required in a HCF. That decision is normally a part of discussions around the functional program, funding availability, and the defined role of the HCF in the community (including whether or not it has a designated function in regional disaster plans).

Note: *The "Requirements and recommendations" column in Table D.1 provide both mandatory requirements and advisory recommendations. If a HCF is not able to comply with the mandatory requirements, it could be asked by its funding agency (e.g., the provincial/territorial government) to provide a description of why the requirement cannot be met and the alternative measures to achieve the intent of the room's functions and design requirement.*

Table D.1
Key space requirements and recommendations — Special-purpose spaces and rooms
(See Clause D.1.)

Item no.		Net area, m²	Requirements and recommendations
1	**Demonstration kitchen**	Varies	**Mandatory:** a) For early planning purposes, 23.2 m² shall be allocated for groups of 8–10 demonstrations (typical for diabetes education programs); 37.2 m² shall be allocated for groups of 11–20. Sizes shall be determined by the functional program. b) The HCF shall obtain the necessary approvals for a demonstration kitchen. **Note:** *Refer to Public Health Act and Food Regulations.* c) Kitchen design and infrastructure shall comply with applicable requirements **Note:** *Applicable requirements can include provincial/ territorial regulations.* **Advisory:** The kitchen should be located with convenient or direct adjacency to meeting rooms or multi-purpose rooms where programs dictate food preparation associated with larger group education sessions. One or two accessible workspaces should be considered, as per the functional program.
2	**Cultural spaces — General**		**Mandatory:** a) The functional program shall define the role and necessity of cultural spaces. b) Actual sizes shall be demonstrated by the functional program through detailed description of the ceremony, space features, and the anticipated number and characteristics of the users.

(Continued)

Table D.1 (Continued)

Item no.		Net area, m²	Requirements and recommendations
			Advisory: The sizes and space allocations are presented for guidance only, for information at the early planning stages.
3	**Sweetgrass ceremonies** • General seating chair • Wheelchair	 1.4 2.8	**Mandatory:** a) The functional program shall provide a description of functions and room requirements, and establish space based on the number of persons in the room/space. b) Room design shall adhere to applicable requirements for fire safety. **Note:** *Provincial/territorial fire codes and regulations can apply.* **Advisory:** If seating is provided, it should contain comfortable furniture and diverse seating sizes and arrangements.
4	**Sweat lodge**	Varies — allow at least 2 m² per person 2.5 m diameter circle to seat 8 to 12 people	**Mandatory:** a) For early planning purposes, 2 m² shall be allocated per person. b) The functional program shall provide a description of functions and room requirements, and establish space based on the number of persons in the room/space. c) The lodge shall conform with applicable requirements. **Note:** *Applicable requirements can include provincial/ territorial and local codes and regulations similar to those required for saunas.* d) Design of a fire pit (if present) shall adhere to applicable requirements for fire safety. **Note:** *Provincial/territorial fire codes and regulations can apply.* e) Doorways shall be of sufficient width to allow for rock access. f) The lodge room shall have the capability to be completely darkened. **Advisory:** a) The location of the sweat lodge should ensure privacy and be away from other buildings. b) Acoustical treatment should be provided to ensure a silent environment. c) Inclusion of shower facilities should be considered. The number and size is to be determined by the functional program. d) The lodge room should have a central fire pit.
5	**Traditional healing medication/herb room/ space**	9.5	**Mandatory:** The functional program shall provide a description of functions and room requirements, as follows: a) A variety of shelving types shall be provided for various container formats including storage of bags and sacks on floor. b) A workstation/table with good lighting for preparation and packaging shall be provided. c) Refrigeration shall be provided; emergency power for refrigeration shall be considered. d) Finely calibrated/accurate humidity and temperature controls shall be provided.

(Continued)

Table D.1 (Concluded)

Item no.		Net area, m^2	Requirements and recommendations
			e) Secure access shall be provided. **Advisory:** a) Room or space is typically separate from the medication room for western medicine. b) A sink might be required.
6	**Meditative space (for up to 15 people)**	16.7	**Mandatory:** a) The functional program shall provide a description of functions and room requirements, and establish space based on the number of persons and characteristics/needs in the room/space. b) Space might be required for multi-purpose functions such as a calming/stabilizing room for mental health or distressed patients or visitors; a quiet room for chronic pain management/yoga, stretching. c) The room shall contain building controls for flexibility (dimmable lighting, temperature control, ventilation). **Advisory:** None.