

*Nursing homes have traditionally been the last refuge for persons who can no longer live at home due to mobility limitations. Although initially only a small percentage of nursing homes were designed to be 'handicapped accessible,' over the years this proportion has grown so that full wheelchair accessibility is now an integral part of nursing home design and expectation. This article and checklist offer a guideline and tool to analyse and evaluate accessibility in nursing homes based on emerging national and international design guidelines.*

**By William (Bill) Benbow, MSW**

# Are nursing homes falling short in full wheelchair accessibility?

## Assessing resident accessibility from an architectural design perspective

As the adage states, 'the devil is in the details'! For nursing home facilities, there is quite a variation in the interpretation of what full accessibility entails - especially for a frail senior. With the growing focus on addressing dementia issues, many new long-term care beds are short-changing accessibility.

Interestingly, the *2010 Americans with Disabilities Act - ADA Accessibility Guidelines* requires only that "... in licensed long-term care facilities, at least 50%... of each type of resident sleeping room shall provide mobility features," that is, accessibility (ADA, 2010).

### Variations in accessibility

For this article, available design guidelines for care facilities from a number of provinces are referenced. One of the problems leading to some confusion is that some jurisdictions have more than one type of long-term care facility. Nova Scotia, for example, has nursing homes and residential care facilities which are for the ambulatory and semi-ambulatory (Nova Scotia DOH, 2007 and 2009).

The Vancouver Coastal Health Author-

ity asks for a more universal approach: "Each design shall incorporate wheelchair and mobility aid access, contiguous floor levels, and allow for adequate turning spaces in all interior living areas and external wandering paths and grounds" (VCH, 2007).

A literature search has found that the issue of accessibility in health facilities, and nursing homes in particular, has received little attention. For example, a 2004 Brazilian study of four hospitals found that there were considerable physical barriers in these institutions and that the pertinent legislation was not being complied with (Pagliuca, 2007). Similar results are evident in many North American health care facilities - old and new.

### Inequitable care provided

In her article "*Ten steps to ensuring hospital accessibility compliance*," architect and comprehensive planner, Katherine McGuinness, points out that "there is growing evidence that persons with disabilities may receive inequitable care due to a lack of accessible facilities, equipment, information and accommodations."

She details many errors, particularly in toilet rooms such as poorly located grab bars, mirrors that are too high, sinks that constrict knee space, and dispensers and trash receptacles that constrict manoeuvring space. She advocates for rooms that are larger than minimum standards (McGuinness, 2013).

### Wheelchair use

Wheelchair manoeuvrability is primarily a function of room size, door and corridor width, and level access. The basic building block for designing accessible space is the area needed to rotate a wheelchair.

American and Canadian accessibility standards are based on a minimum 1,525mm or 5 foot diameter turning circle (ADA, 2010; *Building Access Handbook*, BC, 2007). However, these codes generally use a younger, more fit population to determine the parameters. Older, frailer and disoriented residents are less able to manoeuvre wheelchairs, need a larger safety envelope, often need someone to assist them, and have a more limited reach than independent, more physically adept users of wheelchairs.

Enhanced space allowance makes resident care simpler, puts less strain on staff, gives residents more independence, and requires less resident supervision by limited staff (**Barrier Free Design Guide, 2011**).

McGuinness, noted previously, recommends going beyond the design of minimum standards in order to meet more specialized needs, and also because minimum standards often fail to account for equipment and room furnishings which impact manoeuvring space (**McGuinness, 2013**).

Some health jurisdictions, Alberta for example, are moving away from specific guidelines, preferring a more functionally descriptive approach.

### Accessibility Checklist

For the Checklist attached to this article, more measurable standards have been searched out and are presented. Twenty design features are listed for scoring on a scale of 1, 3, or 5:

- a score of '1' reflects the minimum standard;
- a score of '3' is achieved for an enhanced result and better reflecting the needs of frail seniors; and
- a score of '5' is accomplished for a more complete compliance and for superior elements that would be better able to accommodate specialized needs such as for bariatric residents\* and/or larger wheelchairs.

#### 1. Front entrance:

##### Level walkway to main entrance

One would hope that a site chosen for a facility would be relatively level with easy access to outdoors, parking, side-walks, and surrounding amenities. Minimally, it is expected that, from the main entrance drop-off point, there will be an accessible path of travel for visitors, staff and residents.

The walkway to the front door must be contiguous; i.e., a level plane surface. It should be a minimum 1.5 m (5 ft.) wide and of a permanent, firm, non-slip material. If it is sloped it should be inclined at a maximum 1 in 20 gradient. If there is a drop off of more than 75 mm, it should have a curb of a minimum 75 mm (3 in.) (**Building Access Handbook, BC, 2007**).

#### 2. Front entrance door:

##### Power operated

Building codes and design guidelines require a power-operated front entrance door for care facilities (**Nova Scotia DOH, 2009**). This can be initiated by an easily reached manual push pad or by automatically controlled sensors. Sliding doors are preferable and less cumbersome for wheelchair users. They should have a programmable door closure delay set at 4 to 6 seconds (**Building Access Handbook, BC, 2007**).

#### 3. Front entrance door:

##### Width and clearances

Front entrance doors should have a minimum opening of 914 mm (36 in.). Building codes and ADA guidelines generally require a minimum 800 mm - 815 mm (32 in.) for accessible door openings; however, **Long Term Care Design Guidelines (Benbow, 2013)**, recommend 914 mm (36 in.) as a minimum width for wheelchair accessible doors intended for use by frail seniors.

Equally important for accessibility is a level clear area before each side of the door. These clearances apply to all accessible doors and are there basically to allow the wheelchair to manoeuvre out of the way of the door swing. So, if the door is a swing type, then on the side where the

door swings toward the wheelchair, there must be an area of a minimum length of 1,100 mm (43 in.), plus the width of the door swing. If in a vestibule, then the minimum length is 1,220 mm (48 in.), plus the width of the door. If the door swings away from the user, or if the door is a slider, this area must be a minimum 1,100 mm (43 in.) long.

A feature often missed is the requirement for width clearance on the latch side of doors, i.e., 600 mm (24 in.) on the side of the swing toward the user, and 300 mm (12 in.) on the side of the swing away from the user. This means that the width of the clear and level area must be a minimum of the width of the door plus the latch side clearance (**Building Access Handbook, BC, 2007**). As noted above these are minimum clearances, so a more functional clear and level area before the door would be 1,524 mm (60 in.) wide by 1,524 mm (60 in.) long, plus the width of the door for door swings toward the user.

#### 4. Outside access

It is considered ideal if a care facility is limited to a one or two story building with grade access on both levels for easy accessibility for wheelchairs. Under '*Lessons Learned*,' Nova Scotia points out that "the site should be large enough and of such profile to support the entire

#### \* Bariatric residents

Long-term care facilities are facing an increased demand for accepting and accommodating bariatric residents. Bariatrics is the field of medicine that specializes in treating morbid or extreme obesity. The World Health Organization defines a 'bariatric individual' as one who is:

- overweight by more than 100 pounds;
- has a body mass index (BMI) of 40 or greater; or
- weighs more than 300 pounds (137 kg.).

A recent study by the American Geriatrics Society indicated that elderly who are moderately to severely obese are at a greater risk of needing long-term care services because of the increased risk of disabilities associated with obesity.

##### Obesity increases the risk of the following:

- Hypertension
- Diabetes
- Heart disease
- Stroke and respiratory problems
- Mobility restrictions
- Skin breakdown.

Obesity is a complex condition that is very hard to manage. To meet the needs of bariatric residents, care providers should assess their environment, as well as their equipment and staffing provisions to ensure the right accommodations and care can be safely delivered. ■

facility as a one or two storey structure with a grade access to each level. This approach improves access to the outdoors and provides more possibilities for enjoying natural stimuli, providing a greater sense of security in terms of evacuation, and promoting less reliance on elevators in manoeuvring wheelchairs to events in public areas of the facility” (Nova Scotia DOH, 2007 and 2009).

Easy access to shared amenities and programs is time efficient for staff and residents. However, this is not always economically feasible, particularly in urban locations.

In multi-story configurations, it is expected that there will be access from each level to patios, decks, balconies or sun-rooms. It is preferable that there be direct access from every House; and that doors to the outside area be powered with an electronic pad.

Generally, a larger at grade garden is also shared with all levels; and of course, all outdoor areas should be level with a maximum doorway threshold of 13 mm (1/2 in.).

Although B.C. has traditionally required 1.5m<sup>2</sup> (16 ft.<sup>2</sup>) per resident of outdoor space, recent Alberta Guidelines call for 2m<sup>2</sup> (21.5 ft.<sup>2</sup>) per resident of outside space, which provides more accessibility (Alberta Health, 2012).

### 5. Contiguous floor levels

Floor levels must be contiguous with a continuous level surface. Generally, changes in flooring level are not permitted, particularly where wheelchair manoeuvrability is critical, such as areas designed for turning circles and areas in front of doors and fixtures. However, in some areas, such as walkways, small tolerances are acceptable. Where this does occur, flooring joints should have a maximum vertical height differential of 6 mm (1/4 in.) and preferably no more than 2 mm (1/25 in.). Thresholds should be a maximum 13 mm (1/2 in.) in height and bevelled at 45 degrees or less (ADA, 2010).

### 6. Turning circle (1676 mm - - 5 ft., 6 in.)

Traditionally, care facilities have followed the Building Code requirement for a 1524 mm (5 ft.) turning circle to accommodate wheelchairs (Ontario, 2009; Alberta Health, 2012). However, for frail seniors, the basis for area requirements should be a minimum turning circle of 1,676 mm (5 ft., 6 in.). This is particularly useful for residents requiring an assistant to help them manoeuvre, and for those who utilize motorized wheelchairs.

The B.C. Multilevel Care (MLC) Design Guidelines show that even for an ordinary wheelchair, the turning diameter

with one wheel stationary is 1,855 mm (6.2 ft.). With opposing rotation of each wheel it is 1,650 mm (5.4 ft.) (MLC, 1992). Vancouver Coastal Health Authority calls for a turning circle allowance of 1,800 mm (6 ft.) (VCH, 2007).

Turning circle allowance has a critical impact on the size of resident rooms in terms of clearances and room to manoeuvre on both sides of resident beds and in *Ensuites*.

A good compromise is a turning circle of 1,676 mm (5 ft. 6 in.). This is sensitive to cost issues which result from increased area requirements and is in line with the U.S. Veterans Community Living Centers (CLC, 2011).

Pressalit Care, a leading European manufacturer of specialized bathroom solutions for people with disabilities, has a comprehensive table of turning areas by type of wheelchair, with and without assistance. **See box below: ‘Wheelchair turning circle diameter requirements.’**

### 7. Corridor width of 1,830 mm (6 ft.)

The 2010 Canada National Building Code (CNBC) created a new classification for care facilities that permits a minimum corridor width of 1,650 mm (5 ft., 5 in.). Guidelines for long-term care facilities generally require a minimum corridor width of 1,830 mm (6 ft.) to comfortably

Wheelchair turning circle diameter requirements			
Pressalit Care, Design Guide Bathroom			
Independent user	90 degree turning area	180 degree turning area	360 degree turning area
• with two walking sticks	1100 x 1100 mm	1300 x 1300 mm	1400 x 1400 mm
• with a rollator	1100 x 1100 mm	1300 x 1300 mm	1400 x 1400 mm
• in a manual wheelchair	1400 x 1400 mm	1500 x 1500 mm	1700 x 1700 mm
• in an electric wheelchair	1600 x 1600 mm	1850 x 1850 mm	2100 x 2100 mm
User with a care provider			
in a manual wheelchair	1750 x 1750 mm	1750 x 1750 mm	1750 x 1750 mm
in a comfort wheelchair	2100 x 2100 mm	2100 x 2100 mm	2100 x 2100 mm
in a mobile toilet - and shower chair	1650 x 1650 mm	1650 x 1650 mm	1650 x 1650 mm
in mobile toilet/shower chair	2000 x 2000 mm	2000 x 2000 mm	2000 x 2000 mm
in a mobile hoist	1750 x 1750 mm	2000 x 2000 mm	2000 x 2000 mm
in a ceiling hoist - single track	1500 x 1500 mm	1500 x 1500 mm	1500 x 1500 mm
in a ceiling hoist - track covers entire room	1300 x 1300 mm	1300 x 1300 mm	1300 x 1300 mm
in a mobile shower unit	2100 x 2100 mm	2100 x 2100 mm	2100 x 2100 mm
The size of the area has to be considered in light of the actual users in the type of institution or home. Turning area should generally be 1500 x 1500 mm. For those needing a great deal of care or require large mobility aids, 2000 x 2000 mm is recommended.			

accommodate two passing wheelchairs (Ontario, 2009).

Corridor width often must accommodate service carts, lifts, motorized wheelchairs - as well as unsteady pedestrians. It has been found that a minimum for safe passage in a corridor is 1830 mm (6 ft.). Alcoves or lay-bys are useful for temporary parking of lifts and carts. Some Guidelines require 2,400 mm (8 ft.), but that requirement was derived from the erroneous assumption that patients are moved in their beds in emergencies (VCH, 2007). Articulation of the corridor walls, particularly at doorways and with alcoves, makes the corridor more interesting and functional. So, a minimum of 1,830 mm (6 ft.) with articulation (smooth, visual transition), is a good compromise.

## 8. Minimize length of corridors

Layout of care Houses should be designed with a view to minimize length of corridors in order to reduce distances travelled for staff and residents. Pinet has shown that 'proximity increases usage of amenities.' For example, a space 20 feet away would be used five times as often as a space 100 feet away (Pinet, 1999). Nursing home design guidelines generally support this principle.

Nova Scotia is particularly helpful in providing measurable guidelines: "The travel distance between resident bedroom entry doors and the entrance to the dining room must be 50 feet (15.3 m) for 50% of the residents and less than 75 feet (23.0 m) for the remainder" (Nova Scotia, 2007). Clearly, the accessibility of amenities is a function of their proximity to resident bedrooms; hence, short corridors are preferable and, in some jurisdictions, mandated.

## 9. Resident room useable space

(Excluding *ensuite* and vestibule)

Resident rooms come in two basic configurations:

- a Panhandle design which has a vestibule entrance to a larger interior; and
- a paired *Ensuite* design (a bathroom or shower room attached to and accessible from a bedroom) which has no vestibule and places two *ensuites* between rooms. This makes resident room areas difficult

to compare unless the area is reduced to useable space, i.e., excluding the *ensuite* and vestibule.

A vestibule is approximately 2m<sup>2</sup> to 3m<sup>2</sup> (21ft.<sup>2</sup> to 32ft.<sup>2</sup>), and an *ensuite* generally between 5m<sup>2</sup> and 6m<sup>2</sup> (54ft.<sup>2</sup> - 64ft.<sup>2</sup>). As a result the Panhandle design needs to have a larger area. The overall area of a private resident room including *ensuite* should be a minimum of 22m<sup>2</sup> to 25m<sup>2</sup> (237 ft.<sup>2</sup> to 265 ft.<sup>2</sup>) with Panhandle designs at the upper end of the range because of the vestibule.

Some years ago British Columbia recommended a room size of 21m<sup>2</sup> overall, and this has been found to be very tight for complex care equipment, particularly with the panhandle design (MLC, 1994).

Some recent complex care facilities have designed resident rooms in the mid to high twenties in terms of square metres. This size allows for the larger turning circle of 1,676 mm (5 ft. 6 in.) and so better accommodates electric wheelchairs and lifts.

Some examples are instructive: New Brunswick shows a compact paired *ensuite* design based on a 1,524 mm (5 ft.) turning circle with 15.79 m<sup>2</sup> (170 ft<sup>2</sup>) of clear area excluding the *ensuite* (NB, 2010).

Nova Scotia calls for 17.7m<sup>2</sup> (190 ft.<sup>2</sup>), excluding the *ensuite* for nursing homes (Nova Scotia, 2007); and 15.3 m<sup>2</sup> (165 ft.<sup>2</sup>), excluding the *ensuite* and the vestibule for residential facilities which are for the ambulatory and semi-ambulatory (Nova Scotia, 2009).

With a larger turning circle and a Panhandle design, Vancouver suggests 23m<sup>2</sup> including the 6m<sup>2</sup> *ensuite*, i.e., 17m<sup>2</sup> excluding the *ensuite*, but including a vestibule (VCH, 2007).

U.S. Veterans Affairs, with a Panhandle design and larger turning circle, calls for 20.9 m<sup>2</sup> (225 ft.<sup>2</sup>) for the resident room, plus 6 m<sup>2</sup> (64.5 ft.<sup>2</sup>) for the *ensuite* for a total of 26.9 m<sup>2</sup> (289.5 ft.<sup>2</sup>) (CLC, 2011).

Ontario falls far short of even minimal accessibility with only 12.03m<sup>2</sup> (130 ft.<sup>2</sup>) of useable space (Ontario, 2009).

For a bare minimum, with a 1,524 mm (5 ft.) turning circle, 15.5m<sup>2</sup> to 16m<sup>2</sup> (166.84 ft.<sup>2</sup> to 172.2 ft.<sup>2</sup>) of useable space is acceptable; however, for frail seniors, it is preferable if possible to have 17m<sup>2</sup> (183

ft<sup>2</sup>) of useable space which allows for a 1,676 mm (5 ft., 6 in.) turning circle. And for a bariatric room, New Brunswick has a good graphic showing a paired *ensuite* design of 21.5m<sup>2</sup> (166.84 ft.<sup>2</sup>) of useable space (NB, 2010).

## 10. Resident room minimum dimensions:

### • Clearances

Although useable space is the simplest way to determine a guideline for accessibility, it is also critical to determine minimum dimensions of a resident's room. This is to ensure adequate clearances, i.e., wheelchair passage and walkers past the end of the bed, adequate space for turning circles, and access on both sides of bed.

Vancouver Coastal Health (VCH, 2007) requires a minimum 1,200 mm (3 ft., 11 in.) wide passage for movement past the end of the bed. Nova Scotia requires that there must be a minimum of 1,500 mm (5 ft.) clear on at least one side of the bed and 1200 mm (3 ft., 11 in.) clear at the end of the bed (NS, 2009).

Alberta requires access on three sides of the bed and unobstructed turning radius for a wheelchair on at least two sides (Alberta Health, 2012).

### • Width

Given that a reasonable allowance for a bed length is 2,235 mm (7 ft., 4 in.) (NB, 2010), and adding a passing allowance of 1,200 mm (3 ft., 11 in.), an overall width minimum of 3,435 (11 ft., 4 in.) is tight but acceptable for a paired *ensuite* design. The width needs to be increased to 4,000 mm (13 ft.) in the Panhandle design in order to accommodate the minimum *ensuite* size of approximately 2,200 mm (7 ft., 2 in.), plus partition and width of the vestibule which needs to be a minimum 1,676 mm (5 ft., 6 in.) to allow for the entrance door installation and latch side clearance.

### • Length

In terms of length, a Panhandle entrance and adjacent *ensuite* consumes approximately 2,133 mm (7 ft.) of the length of the room. In the remaining length 1,066 mm (3 ft., 5 in.) of bed width (including rails) needs to be accommodated, with night tables and perhaps an armoire or chair and bed access clearances. This re-

sults in a minimum length of 6,550 mm (21 ft., 6 in.) for the Panhandle design and 4,548 mm (14 ft., 11 in.) for the paired *ensuite* layout.

For a panhandle design with a turning circle of 1,524 mm (5 ft.), a minimum of 4,000 mm (13 ft., 1 in.) by 6,550 mm (21 ft., 6 in.) is required.

A paired *ensuite* layout needs a room 3,455 mm (11 ft., 4 in.) by 4,548 mm (14 ft., 11 in.) (NB, 2010).

Resident rooms based on a 1,676 mm (5 ft., 6 in.), turning circle will need to be slightly larger, as will rooms designed for bariatric residents. The U.S. Veterans Affairs has examples of standard and bariatric rooms based on a Panhandle design and a 1,676 mm (5 ft., 6 in.) turning circle (CLC, 2011). New Brunswick has examples of paired *ensuite* bariatric rooms with a larger turning circle (NB, 2010).

### 11. Resident room *ensuite* size

The size of *ensuites* need to accommodate wheelchairs and should be a minimum 5.3m<sup>2</sup> (57 ft.<sup>2</sup>). This is a minimum size and is designed to allow a 1,524 mm (5 ft.) turning circle and a European style shower where the toilet can be used as a shower seat. Without a shower, 4.5m. is an acceptable minimum (NS 2009); however, Nova Scotia requires 7m<sup>2</sup> (75 ft.<sup>2</sup>) for an *ensuite* when a wheelchair accessible shower is included (NS, 2007).

New Brunswick guidelines have an *ensuite* of 5.6 m<sup>2</sup> (60 ft.<sup>2</sup>) (NB, 2010). A more preferable size is 6m<sup>2</sup> (65 ft.<sup>2</sup>) which can better accommodate trash receptacles and glove and sanitizer dispensers which McGuinness has referenced as a growing concern (McGuinness, 2013). This also allows for a 1,676 mm (5 ft., 6 in.) turning circle, a shower chair and adequate space for staff assistance on two sides of the toilet (CLC, 2011).

Another way to measure the accessibility adequacy of the resident room *ensuite* is to require a minimum dimension of 2400 mm x 2200 mm (7 ft., 10 in. x 7 ft., 3 in.). This yields the minimum 5.3m<sup>2</sup> and ensures the minimum 1,524 mm (5 ft.) turning circle.

A square room of 2,438 mm (8 ft.) sides will provide 6m<sup>2</sup>. For 7m<sup>2</sup>, a room would need a minimum dimension of 2,600 mm

by 2,700 mm (8 ft., 6 in. by 8 ft., 10 in.).

### 12. Resident room and *Ensuite* door openings

Usable door openings for resident rooms should be between 914 mm (36 in.) and 1,220 mm (48 in.), while *ensuite* doors should be a minimum of 914 mm (36 in.). While 914 mm is adequate for wheelchair movement, the rationale for the entrance door being larger has traditionally been to allow for bed movement. Ontario requires 1,120 mm (44 in.) for resident room doors and 914 mm (36 in.) for *ensuites* (Ontario, 2009).

New Brunswick and Vancouver call for 1,220mm (48 in.) for the entrance door. Vancouver also requires 1,220 mm (48 in.) for the *ensuite* door (NB, 2010; VCH, 2007). Most authorities will allow two leaves for the entrance door so that the one leaf has a minimum 900mm clearance. For its residential care facilities, Nova Scotia accepts the entrance doorway at a minimum 915 mm (3 ft.) (Nova Scotia, 2009).

Swing doors can be awkward for residents in wheelchairs, and consume a great deal of space, so alternatives for *ensuite* doorways could be considered, such as pocket doors, sliding track doors (barn style), accordion style and saloon style (Nova Scotia, 2009).

However, there is some concern that dementia residents may be confused by non-traditional doors. Some facilities receive permission from the relevant authorities to remove the *ensuite* doors entirely in dementia units.

Washroom doors should not open inwards unless extra allowance is made to ensure that fallen residents cannot be trapped behind the door. Two-way or double acting safety hinges can mitigate the size of room required.

Clear area requirements in front of doors are the same as for front entrances. Particular attention needs to be paid to latch side clearances, i.e., 600 mm (2 ft.) for door swing toward the user, and 300 mm (1 ft.) for swing away from the user.

### 13. *Ensuite* toilet access (Height and clearances)

Barrier free toilets vary from 400 mm (16 in.) to 460 mm (18 in.) (Nova Scotia,

2009). Elderly women tend to be shorter and prefer a medium height of approximately 431 mm (17 in.).

Clearances are critical for toilet access and assistance. Alberta shows 800 mm by 1500 mm (32 in. by 60 in.) clear area for side access to the toilet on one or two sides (Alberta, 2012). Vancouver requires access from 3 sides, with clearances of 600 to 800 mm on each side (VCH, 2007).

Ontario is more conservative requiring access from the front and at least one side (Ontario, 2009).

Some facilities install toilets with one side access alternating from room to room on left or right sides to allow for room assignment as needed.

### 14. *Ensuite* fixtures

A barrier free sink requires at least 700 mm (28 in.) on at least one side of the sink for an assistant, and 1100 mm (44 in.) long by 800 mm (32 in.) wide in front of the sink.

The sink should have a maximum height of 865 mm (34 in.) with under sink clearances of 735 mm (29 in.) at the front edge, tapering to not less than 660 mm (26 in.) at a point 250 mm (10 in.) back from the front face (Building Access Handbook, 2007).

Some facility models are including *ensuite* showers in the resident bathroom to provide privacy, integrate personal care, reduce fears and discomforts of communal bathing, and assist with incontinence issues and infection control (VCH, 2007; CLC, 2011). This is becoming a standard in most new care facilities in British Columbia, is common in Europe, and is now a requirement in Alberta, (Alberta, 2012).

European style showers use the entire washroom by providing impervious wall and floor finishes and a floor drain.

Modular showers should be 1500 mm by 900 mm (5 ft. by 3 ft.), have a maximum bevelled threshold of 13 mm (1/2 in.), and a clear entrance area of 1500 mm by 900 mm (60 in. by 36 in.) (Building Access Handbook, BC, 2007).

*Ensuites* should include tilting mirrors for wheelchair users, and sufficient grab bars for safety near all fixtures, as well as glove and sanitizer dispensers and trash receptacle. Consider a nurses' cupboard for special supplies.

## 15. Assisted bathing suite

Assisted bathing tubs are standard in care facilities, usually with accessible showers - although bathing suite showers can be eliminated if they are provided in resident *ensuites*. Usually there is one bathing spa per House or shared in a Neighbourhood of two Houses - for 24 to 36 residents. (VCH, 2007).

Alberta requires a 1200 mm (48 in.) entrance door, and tub access on three sides (Alberta, 2012). Assisted bathing tubs come in a variety of formats, including recumbent.

Sufficient area needs to be allocated to allow manoeuvrability of stretchers and lifts. Nova Scotia (2007) requires 1200 mm (48 in.) access on three sides.

Ceiling lifts are usually part of the room specifications, although some tubs are designed with their own lifts.

An area of 20m<sup>2</sup> to 24m<sup>2</sup> (215 ft.<sup>2</sup> to 258 ft.<sup>2</sup>) is recommended to accommodate fixtures, clearances and storage. This allowance includes an adjacent toilet and sink.

New Brunswick allocates 15.8m<sup>2</sup> (170

ft.<sup>2</sup>) for a Bathtub Room, 8.4m<sup>2</sup> (90.5 ft.<sup>2</sup>) for the Shower Room, plus 5.6m<sup>2</sup> (60 ft.<sup>2</sup>) for Bathing Suite Storage (NB, 2010).

## 16. Door handles and closures

The *Canadian National Building Code* requires that door handles be operable by devices which do not require tight grasping, or twisting of the wrist. "Doors need to operate with a force not more than 38 N (8.5 pounds) for exterior doors and 22 N (5 pounds) for interior doors. This can be measured with an inexpensive Door Pressure Gauge" (Building Access Handbook, 2007). Push-pull mechanisms that do not require grasping are accepted (Ibid., 2007).

It is preferred that doors not have closures, but if they do, there should be a minimum 5 second delay (ADA, 2010). Lever or blade handles are preferred on both doors and fixtures.

Alberta requires blade handles on faucets to be 10.2 cm. (Alberta Health, 2012). Ontario prefers C or D type handles on sliding doors. (See also box below).

Also, it is a good idea to use contrasting

colours for handles (VCH, 2007).

## 17. Resident room ceiling lift system

Ceiling track lifts should be considered for complex care resident rooms and in assisted bathing rooms. An overhead lift system can reduce staff injuries and is economical in terms of space.

Mobile floor lifts are certainly acceptable but do require considerable space for manoeuvrability. Nova Scotia requires ceiling tracks in every resident bedroom and sufficient lifts to accommodate 1 in 6 residents (Nova Scotia, 2007).

New Brunswick (2010) requires ceiling lifts that run from the resident's bedroom into the *ensuite*. The tracks are to be recessed and coloured to match the ceiling.

Vancouver requires an X-Y gantry ceiling lift system that provides better room coverage than a single track; it's optional to run a track into the *ensuite* (VCH, 2007).

Alberta guidelines leaves it up to the facility to determine whether to use mobile floor lifts or ceiling lifts and points out the serious design complications of extending the ceiling track from a resident's bedroom into the *ensuite*, i.e., raising the *ensuite* ceiling and overcoming challenges in mechanical ducts and pipes (Alberta Health, 2012). Some residents have reported that it is uncomfortable to be transferred by a ceiling lift into the *ensuite* rather than in a commode or wheelchair.

## 18. In-house amenity area

### (Dining + Lounge + Activity)

Minimum allocation for amenity space for resident use should total 6m<sup>2</sup> (64.5 ft.<sup>2</sup>) per resident in each House unit: 3m<sup>2</sup> (32 ft.<sup>2</sup>) for dining and 3m<sup>2</sup> (32 ft.<sup>2</sup>) for lounge/activity. Complex care is experiencing a rapidly increasing use of wheelchairs, geriatric chairs, and walkers, so a total of 7m<sup>2</sup> (75 ft.<sup>2</sup>) would be preferable.

B.C. determined that a minimum of 3m<sup>2</sup> (32 ft.<sup>2</sup>) per resident is required for dining in order to accommodate wheelchairs (MLC, 1994). Vancouver follows this with 3m<sup>2</sup> for dining, but only 2.5m<sup>2</sup> for lounge/activity (VCH, 2007).

Experience indicates that Lounge and Activity allowances also need to be properly sized to a minimum allocation of 3m<sup>2</sup> (32 ft.<sup>2</sup>) per resident. Recently U.S.

## Vancouver bans doorknobs as it opts for greater accessibility

Doorknobs in the City of Vancouver, including those in nursing homes, hospitals, public buildings, etc., are to be replaced by levers as a result of that city's legislative council voting a Bylaw that approves a ban on doorknobs in newly constructed buildings. Justification for the ban is to provide buildings with greater accessibility for all citizens and comes into effect in March, 2014. The Bylaw also extends to faucets, making Vancouver the first city in Canada to ban these devices.

Following the amendment to its Building Code, instead of doorknobs, Vancouverites will see levers on doors and sinks of all new buildings; existing structures are to be grandfathered into the new regulations, but will be bound by the Bylaw when construction changes or expansion takes place.

### 'Universal design'

Vancouver is the only municipality in Canada with its own building code, although it does follow the *National Building Code of Canada*.

The doorknob ban is a move that will

help such groups as the elderly, the arthritic, and the disabled, who experience difficulty grasping and turning a round doorknob. Vancouver's new addendum to its Building Code represents a change in philosophy known as 'universal design', where buildings are designed and outfitted to be convenient for such groups, as opposed to designs that only benefit the largest portions of society.

The idea is to make environments as universally usable by any segment of the population including the elderly, the disabled, etc. What 'universal design' does is build everything so it is as usable or accessible, as much as possible, by the largest segments of the population.

A simple version of 'universal design' is the cut (graded) curbs on street corners; this helps the elderly, those with visual impairments and others with disabilities. In short, 'universal design' makes, for example, a door, sidewalk or a sink, that would otherwise be difficult for parts of the population, universally accessible to everyone. Vancouver often influences building codes within the rest of Canada. ■

# Nursing Home Accessibility Checklist

Benbow 2013

Facility: \_\_\_\_\_

Unit: \_\_\_\_\_

Date: \_\_\_\_\_

Rater: \_\_\_\_\_

Contact Phone: \_\_\_\_\_

E-mail: \_\_\_\_\_

Intervention	Design Feature	Minimal	Average	Superior	Score	Notes
<b>Accessibility</b> (Max. 100 pts)	<b>Assign rate of 1, 3, 5, or 0 for each item</b>	<b>A</b> <b>1</b>	<b>B</b> <b>3</b>	<b>C</b> <b>5</b>		<b>Support documentation for scoring is available from &lt;billbenbow@shaw.ca&gt;</b>
Front Entrance	1. Walkway to main entrance					Continuous level surface: 1525mm wide, ≤1 in 20 gradient
	2. Facility Entrance power operated					Prefer sliding doors with adjustable opening/closing delay.
	3. Facility Entrance door clearance					Clear rectangular area before door: 1100mm + door swing in length by width of door + latch allowance; 600 mm away, 300 mm towards.
Outside grade access	4. Grade access from House Units					All levels have outdoor access: Sunrooms/decks for House units on floors without grade access.
Floor Levels	5. Contiguous floor levels					Thresholds ≤ 1/2 in. and bevelled ≤ 45 degrees; joints ≤ 1/4 in.
Turning Circle	6. Wheel chair turning Circle: resident room, ensuites, amenities					1676mm needed for turning with opposing rotation of wheels.
Corridors	7. Corridor width					1830 mm + door insets, laybys or alcoves for parking carts, lifts.
	8. Corridor length					Bedroom to dining room - 15.3m (50 ft.) is a good median distance.
Resident Room	9. Resident room useable space: (excluding ensuite & vestibule)					Ensuite: 4.5 to 7 sq. m. Vestibule: 2 to 3 sq. m.
	10. Panhandle design Paired Ensuite design:					<b>Panhandle design:</b> (A) is from CRD (wabenbow.com), (B) is from (CLC, 2011, p.4-13) (C) is from (CLC, 2011, p.4-19). <b>Paired Ensuite:</b> (A) is from NB, 2010, p.27. (B) is from Jensen (Ayre Manor) (C) is from NB, 2010, p.29.
Resident Ensuite	11. Resident room ensuite area					With shower: 5.3 - 7 sq.m. If no shower 4.5 - 6.5 sq.m.
Doors	12. Door openings: Resident room    Ensuite					Resident entrance - 914mm; ensuite-914 mm Latch jam side clearance: inside 600mm; outside 300mm
Ensuite	13. Ensuite Toilet:					Height: 400 - 460mm Side clearance for toilet access should be 600 - 800 mm x 1500mm.
	14. Ensuite Fixtures:					Under sink clearance: 735mm: Consider ensuite shower; and nurses cupboard.
Bathing Suite	15. Assisted Bathing Suite:					20 - 24 sq.m including wc: Provide tub access on three sides.
Door Handles	16. Resident Room Door handles					Push, pull or lever; Closure between 22 - 38 N forces.
Ceiling Lift	17. Resident Room ceiling lift system					Full room coverage preferable.
Amenities	18. In-House Amenity area: dining + lounge + activity					6 - 8 sq.m: Can share activity
Controls	19. Resident Area Controls: height from finished floor					Height ≤ 1200 mm; Consider ensuite Motion sensor.
Windows	20. Resident Area Windows: viewing height"					≤ 630 mm; natural light and vistas

Veterans Affairs determined that activities requiring tables, such as dining and social areas, need a minimum 3.35m<sup>2</sup> (36 ft.<sup>2</sup>). This is based on 1220 mm (48.5 in.) square tables arranged at diagonals and provides circulation of 1220 mm (48.5 in.), which includes turning space to avoid conflicting with other occupants while conserving necessary square footage (CLC, 201).

In line with this for its nursing homes, Nova Scotia requires 3.3m<sup>2</sup> (36 ft.<sup>2</sup>) for dining and 3.34m<sup>2</sup> (36 ft.<sup>2</sup>) for living area per resident in each House for a total of 6.7m<sup>2</sup> (72 ft.<sup>2</sup>) (NS, 2007).

New Brunswick calls for 3.5m<sup>2</sup> (37.5 ft.<sup>2</sup>) for dining and 2.5m<sup>2</sup> (27 ft.<sup>2</sup>) for lounge for a total of 6m<sup>2</sup> (64.5 ft.<sup>2</sup>), plus an additional allowance for activity area (NB, 2010).

With the movement towards a smaller number of residents in each House it has become difficult to provide a variety of living areas with the traditional per resident amenity area allowance, particularly if there is a desire for shared neighbourhood multipurpose activity space. Six to seven square metres per resident of in-House amenity area is reasonable.

## 19. Resident area controls

### (Height from finished floor)

Switches and other resident activated controls should be within the reach threshold of frail residents; i.e. located between 900 mm and 1200 mm (35.5 in. and 47 in.) from the floor (Building Access Handbook, 2007). In addition there should be a clear floor area adjacent to the controls with a minimum of 1220 mm x 1220 mm (48 in.<sup>2</sup>) (ADA, 2010). Consider motion sensor-activated controls; e.g., for light switches in *ensuites*.

## 20. Resident area windows

### (Viewing height from floor)

Alberta requires that each resident bedroom have one operable window located a maximum of 610 mm (24 in.) from the floor in order to provide direct views of the outside from both a sitting and lying-in-bed position. The window should provide good levels of natural lighting and not open more than 152 mm (6 in.) for safety (Alberta Health, 2012).

Nova Scotia and New Brunswick have similar requirements with a sill height of 630 mm (25 in.) (NS, 2007; NB, 2010). Ontario (2009) follows suit with a requirement for a sill height maximum of 600 mm (24 in.), and an overall window size of at least 10% of floor area of the bedroom to ensure sufficient natural light.

## Conclusion

Katherine McGuinness (2013) provides several strategies for ensuring accessibility compliance, including using a "design punch list" to check a project for common errors and non-functional elements such as heavy doors without automatic openers, toilet rooms built to minimum dimensions, shower stalls with high thresholds, and generally inadequate manoeuvring space. This Accessibility Checklist is just such a list and is offered for use in planning and evaluating care facilities. ■

## References

- ADA - Americans with Disabilities Act 2010. Standards for Accessible Design, U.S. Department of Justice; p.82; 2010. <<http://www.ada.gov/regs2010/2010ADASTandards/2010ADAStandards.pdf>>.
- Alberta Health. Design Guidelines for Continuing Care Facilities in Alberta; 2012. <<http://www.health.alberta.ca/documents/CC-Design-Guidelines-Facilities-2012.pdf>>.
- Barrier Free Design Guide. U.S. Department of Veterans Affairs, 2011. <<http://www.cfm.va.gov/til/dGuide/dgBarrFree.pdf>>.
- Benbow, William, Long Term Care Design Guidelines Comparison Chart, 2013. <[http://wabenbow.com/?page\\_id=315](http://wabenbow.com/?page_id=315)>.
- Building Access Handbook, BC, 2007. (Based on Canada National Building Code). <[http://www.housing.gov.bc.ca/pub/building\\_access\\_handbook\\_2007.pdf](http://www.housing.gov.bc.ca/pub/building_access_handbook_2007.pdf)>.
- CLC - Design Guide, Community Living Centers. U.S. Department of Veterans Affairs; p.4-7; 4-19; 2011. <<http://www.cfm.va.gov/til/dGuide/dgCLC.pdf>>.
- Ontario, 2009: Long Term Care Home Design Manual, Ministry of Health and Long-Term Care, Ontario; 2009. <[http://www.health.gov.on.ca/english/providers/program/ltc\\_redev/renewalstrategy/pdf/home\\_design\\_manual.pdf](http://www.health.gov.on.ca/english/providers/program/ltc_redev/renewalstrategy/pdf/home_design_manual.pdf)>.
- McGuinness, Katherine, "Ten steps to ensuring hospital accessibility compliance." *Health Facilities Management Magazine*; March, 2013. <[http://www.hfmmagazine.com/hfmmagazine/jsp/articledisplay.jsp?dcrpath=HFMMAGAZINE/Article/data/03MAR2013/0313HFM\\_FEA\\_CompOps&domain=HFMMAGAZINE](http://www.hfmmagazine.com/hfmmagazine/jsp/articledisplay.jsp?dcrpath=HFMMAGAZINE/Article/data/03MAR2013/0313HFM_FEA_CompOps&domain=HFMMAGAZINE)>.

jsp?dcrpath=HFMMAGAZINE/Article/data/03MAR2013/0313HFM\_FEA\_CompOps&domain=HFMMAGAZINE>.

- MLC - Multilevel Care Design Guidelines. Victoria, BC; 1992; 1994. <[http://wabenbow.com/?page\\_id=173](http://wabenbow.com/?page_id=173)>.
- NB, 2010 - Design Standards for Nursing Homes, New Brunswick, 2010; p.29 and 31. <<http://www2.gnb.ca/content/dam/gnb/Departments/sd-ds/pdf/NursingHomes/Nursing-HomeDesignStandards-e.pdf>>.
- Nova Scotia DOH (2007), Long Term Care Facility Requirements (Space and Design), RFP 60131638, Appendix B; Nova Scotia Department of Health, 2007/2008. <[http://www.gov.ns.ca/health/ccs\\_strategy/LTC\\_Facility\\_Requirements.pdf](http://www.gov.ns.ca/health/ccs_strategy/LTC_Facility_Requirements.pdf)>.
- Nova Scotia DOH (2009) - Long Term Care Residential Care Facility, Facility Requirements, RFP 60137609. Appendix B; 2009. <[http://www.gov.ns.ca/health/ccs\\_strategy/RFP0709/Facility%20Requirements%20RCF\\_Appendix\\_B.pdf](http://www.gov.ns.ca/health/ccs_strategy/RFP0709/Facility%20Requirements%20RCF_Appendix_B.pdf)>.
- Pagliuca, Lorita, et al., Accessibility and physical deficiency: identifying architectural barriers in internal areas of hospitals in Sobral, Ceara (Brazil), *Revista da Escola de Enfermagem da USP*; 41(4); p.581-588, 2007.
- Pinet, Celine, Distance and the use of social space by nursing home residents. *Journal of Interior Design*; 25(1); p.1-15; 1999.
- Pressalit Care, Design Guide Bathroom, UK; p.12-13; 2007. <<http://www.e-pages.dk/pressalitcare/29/12>>.
- VCH, 2007; Complex Residential Care Developments, Vancouver Coastal Health (VCH) Design Guidelines, British Columbia; 2007. <<http://wabenbow.com/wp-content/uploads/2011/06/VCH-Complex-Care-Design-guidelines-June-6-07.pdf>>.

## About the author

Bill Benbow is a Health Planner and Consultant on seniors health care and housing projects. He assists in co-ordinating with health authorities to ensure quality, value, efficiency, and compliance with regulations and guidelines. Recently he was the Development Consultant for a combined complex care and assisted living facility on Vancouver Island.

Bill has extensive experience as a Project Manager of Capital Projects and as a Capital Treasury Board Analyst with the B.C. Government; he also chaired the Multilevel Care Design Guidelines Review Committee in B.C.

Mr. Benbow is particularly interested in the development and implementation of functional design guidelines in the fields of seniors' housing and long-term care facilities.