Group living is recognized as a supportive and positive arrangement for residents with dementia, as well as a beneficial environment for care staff. There are, however, a number of considerations in establishing this concept, with the main one involving the design features of the environment itself. This article looks at the advantages - and disadvantages - of group living as it relates to the 'Small House,' with its two sub-sets: the Neighbourhood or Household Model, and the Independent 'Small House' Model.

By Bill Benbow, MSW, Development Consultant

Advantages of 'Small House' designs in dementia care

The physical environment sets a limit to what can be achieved in the care of people with dementia

An important principle in the physical design of nursing home facilities was highlighted by Richard Fleming, a psychologist and director of the Dementia Services Development Centre at the University of Wollongong in New South Wales, Australia: "In the long term, the physical environment sets a limit to what can be achieved in the care of people with dementia - especially those that are mobile. A good environment can, almost by itself, reduce confusion and agitation, improve wayfinding and encourage social interaction.

"On the other hand, a poor environment increases confusion and problem behaviours and will eventually reduce staff to a state of helplessness, in which they feel that nothing can be done" **(Fleming and Purandare, 2010; Fleming, 2009).**

Small scale clusters

In an article entitled *"Ten new and emerging trends in residential group living environments,"* it was pointed out that one of the most significant North American developments was the movement from large scale nursing homes to small scale clusters of about ten residents each. It was noted that these individual clusters are often combined into group clusters of between 5 and 7 units and connected to a larger system of service provision. Nursing homes in Northern Europe have had this model for years based on clusters of 6 to 8 residents **(Regnier and Denton, 2009).** Typically, residents' rooms are grouped around the kitchen, dining, living and activity areas.

Positive outcomes

Dr. Margaret Calkins, Ph.D., also looked at the ten most significant changes in senior living design over the past decade and concluded that the Small-House and Household model was one of the major highlights **(Calkins, 2011).**

She found that virtually every study that examined resident/staff outcomes pertaining to the size of resident groupings concluded that the outcomes were more positive with smaller groupings. These outcomes included:

- less disruptive behaviours;
- greater socialization;
- reduced psychoactive medication use;
- greater resident, family and staff satisfaction. Calkins went on to discuss the particular efforts being made to deal with codes and regulations that hamper 'Small House' and 'Household/Neighbourhood' Model development.

Small and homelike

In the Fleming-Purandare article, their review of the current research literature found that residents should:

- be able to see the features that are most important to them from the location(s) where they spend most time;
- have unobtrusive security measures;
- have a variety of amenity spaces;
- have a single bed room; and
- be able to enjoy a minimum of unhelpful stimulation while experiencing maximum beneficial stimulation such as high levels of illumination

(Fleming and Purandare, 2010).

The authors further maintained that "it is desirable that the facility be small, have a homelike appearance, provide opportunities for engagement with the ordinary activities of daily living, and have accessible outdoor space."

Gaius Nelson, a U.S. architect de-

scribes the evolution of nursing homes from the "institutional to the small house model," **(Nelson, 2009)**. Nelson, a pioneer in the movement toward the 'Small House' model, was instrumental in the development of the Creekview Household model in Oshkosh, Wisconsin. He based the size of his Household on the observation that *"in any group we tend to see one-third of residents who participate in all offered activities, one-third who almost never participate, and one-third who may or may not join in."* He concluded that a Household of between 8 and 12 would provide the optimum formation for a social group of between three and eight residents.

Small scale 'dementia homes'

Caroline Cantley and colleague reviewed several British nursing homes in her book "Put Yourself in my Place," (2002). She found that there is broad agreement that it is desirable for 'dementia care homes' to be small scale - in the range of six to around 14 residents. She points out that as the size of the unit increases, there is a move away from having a "family feel" in the 'home'. Despite this, however, she indicates that financial viability is driving the size of 'homes' upward in number of residents cared for.

Staffing models and costs are also impacted by the size of the house. The Multilevel Design Guidelines British Columbia 1994 recommended, for example, that "the Care Unit (House) should have the smallest number of beds that is operationally feasible with available staffing."

Recently a Health Authority in B.C. moved from recommending 18 as the maximum number of residents, to Houses of 25, with 20 the preferred for dementia units **(Fraser Health, 2007)**. These larger Houses can compromise quality of care, with longer corridors and larger groups of residents to manage.

Mitigating the negatives

There are physical designs, however, that can mitigate some of the negatives associated with larger Houses. An L or Chevron shape or an H shape, for example, can provide sub-divisions within the larger House, i.e., two wings or smaller Households which could each have 5 to 12 resident bedrooms with adjacent lounge and dining area. Alternatively, the combined census of 10 to 24 could dine together for staffing efficiency. The combined wings would share utility and other support areas.

Nelson (2009) points out that interconnected multiple Households have greater flexibility in either adding staff as needs increase, or reducing staff levels during the night time. This is particularly important where residents with behaviour or mental health issues are cared for. Adjustments in staffing levels are more difficult in separate detached houses where staffing can never be reduced to less than one staff member per Household.

Recent research

Hilde Verbeek recently published her thesis for Maastricht University titled "Redesigning Dementia Care," which is an evaluation of small-scale, homelike care environments (2011).

Verbeek executed a twelve month study in the Netherlands comparing dementia residents of twenty-eight small-scale living facilities with an average of six to eight beds, with twenty-one traditional nursing home wards of at least twenty residents each. Residents were matched for cognitive and functional status and stage of dementia.

She, to, found significantly fewer physical restraints and psychotropic drug use in the small-scale living facilities compared with regular wards. In addition, residents in small-scale living facilities were significantly more socially engaged, and displayed fewer physically non-aggressive behaviours, such as wandering, than residents in regular or traditional wards.

Verbeek also found significantly lower levels of burnout symptoms for nursing staff working in most typical small-scale living facilities. Family members and staff mainly reported positive experiences with the small-scale living arrangement. Families were especially appreciative of the personal attention staff could provide their loved ones.

Financial implications

A major consideration in Smaller Houses or Linked Households is that of the financial impact. Verbeek dealt with this issue, as did Jenkins and colleagues in their recent article, *"Financial Implications of the Green House Model"* **(Jenkins et al., 2011)**. They found that the operations of the Small House model are comparable in cost to traditional nursing home operations. For example, care staff generally multi-task; the increase in staff needed to cover smaller units is offset by a commensurate decrease in housekeeping, dietary, laundry, activity and administrative staff.

Verbeek found that small-scale living facilities were reported to be more vulnerable to shortages in staff. She points out that the size of these small facilities, which average seven residents per House in the Netherlands, could hamper their financial feasibility. To overcome this she alludes to some explorative studies suggesting that a clustering of units or slightly larger groups (e.g., 10 to 12 residents) could improve the facilities financial feasibility. She calls for more cost-analyses and cost-effectiveness studies.

Anecdotal information and experience suggests that linked households and grouped houses offer the best economies of scale for operations, as opposed to independently located Small-Houses.

Rethinking amenity space

One impact of smaller, self-contained wings/Households is the need for a larger allocation of amenity space.

Houses need to be self-contained in terms of amenity space, i.e., lounge, activity, and dining areas. Allocation per resident for these areas averages around 2.5 sq. metres [27 sq. ft.] for lounge/activity, and 3 sq. metres [32 sq. ft.] for

dining. In addition, there is usually an allocation for multipurpose space.

Recent post-occupancy reviews indicate that, with the increasing complexity of residents in care, it really is necessary to rethink the allocation of amenity spaces. It is becoming especially difficult for complex care residents to actively participate in more traditional programs such as a Country Kitchen (see page 11) or entertainment activities and larger gatherings outside the residents' House. As attractive as it is to provide programming outside, it is becoming less practical, and extremely staff intensive. Portering complex care residents to out-of-house amenities not only takes a lot of staff time, but stretches staff resources left to manage the residents remaining in the Houses.

Sub-dividing large houses

Facilities are reporting that complex care residents are increasingly using in-house spaces for entertainment and group activities. Moreover, there is not a great deal of mixing of resident groups for these larger types of activities; i.e., frail but stable elderly residents do not really appreciate being grouped with dementia residents for social activities.

In order to sub-divide the Large House population of 25 to 30 into more manageable Social Wings or Smaller Households, it really requires an increase in the in-house allocation of social space. Something in the range of 4 square metres [43 sq. ft.] per resident will allow sub-groups to have their own lounge and activity areas. This can be achieved by transferring some multi-purpose space to within the House. This would still leave some multi-purpose space for those residents who can participate in out-of-house activities; this could be a family and visitor meeting area such as a café or multi-purpose meeting room and chapel. This additional in-house amenity space can be offset with a reduction in corridor area, both in width and length. There is some movement towards corridor-free designs, though this has licensing/regulatory barriers - which are not insurmountable.

Handrails

One factor to consider in reducing the area requirements for corridors is to reduce the use of handrails which effect the usable width of corridors.

In British Columbia they have been building some complex care facilities without handrails. The thinking is that residents who use mobility aids do not need hand rails. Indeed, much damage is done to walls when residents in wheelchairs use handrails inappropriately to propel themselves along.

The elimination of handrails could be a considerable cost saving. Nelson, in his article **(2009)**, states that *"within a Household, the need for and desirability of handrails is significantly reduced, if not eliminated."*

Corridor width

A case can be made for more home-like, narrower corridors, i.e., 1830 mm (6 feet), rather than the traditional 2400 mm (8 feet) of nursing homes.

The Ontario Long Term Care Home Design Manual **(Ontario Ministry of Health, 2009)** calls for a minimum corridor width of 1820 mm (6 feet).

Traditionally, Building Codes have required that corridors be 2400 mm (8 feet) as it may be necessary to move a resident in a bed in emergencies. However, the new National Building Code of Canada **(NBC, 2010)** contains a new occupancy classification for care facilities, and requirements that are commensurate with the anticipated use conditions of a variety of facilities that provide care, but do not perform invasive medical treatment. One of the results of this changed classification system for some care facilities is that "corridors shall be at least 1650 mm wide" (5.4 feet). In addition, dead-ends up to 6 metres (20 feet) long are permitted by the 2010, National Building Code of Canada.

The Multilevel Design Guidelines, British Columbia 1994, point out that a 1830 mm corridor width [6 feet] with rest areas or lay-bys at the resident room doors is adequate to move beds in and out of the resident rooms, and is also adequate for 2 wheelchairs and for people with moderate to severe cognitive dysfunctions to pass each other.

The main advantage to the wider 2440 mm corridor [8 feet] is the accommodation of cleaning and storage carts which frequently clutter corridors. This could better be met with built-in alcoves, or adequate equipment and supply storage, or both.

The Design Guidelines for Queensland Residential Care Facilities **(1999)** call for "discrete bays to provide for trolleys and equipment." A 6-foot-wide corridor with alcoves and inset doorways could work quite satisfactorily and save considerable space. Nelson recommends the elimination of the requirement for eight foot corridors in nursing homes, and going with six feet instead **(2009)**.

Excessive corridor distance

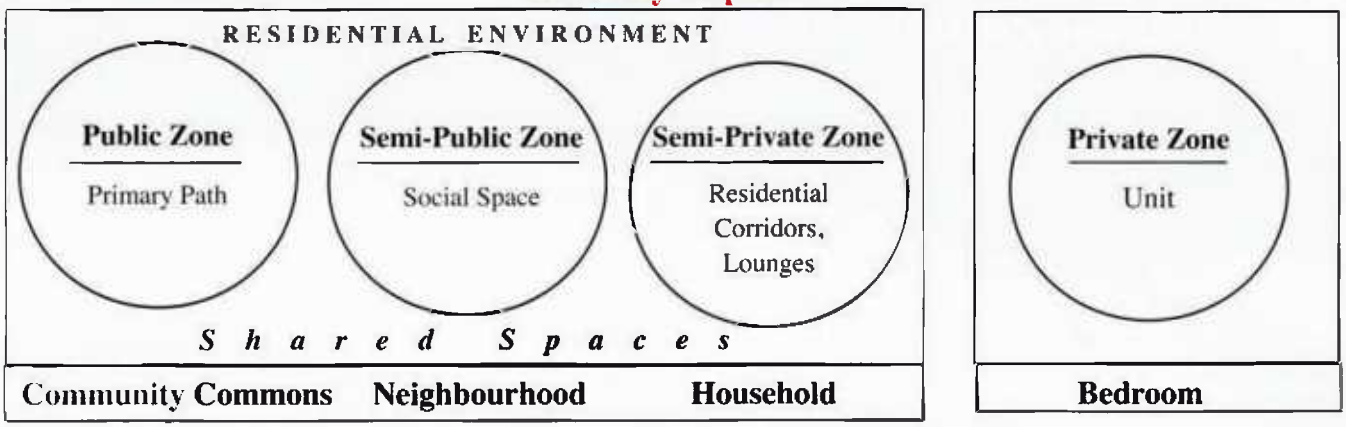
An interesting analysis of the effect of excessive corridor distance is provided by Celine Pinet in an article entitled *"Distance and the Use of Social Space by Nursing Home Residents."*

Pinet **(1999)** studied the behaviours of 960 residents in five nursing homes and concluded that there was a significant negative relationship between distance and the probability that a resident would use a social space. A space 6 metres [20 feet] away would be used five times as often as a space 30 metres [100 feet] away. A double-loaded corridor with 15 resident rooms can easily be over 40 metres in length (130 feet).

Pinet concludes by suggesting that it would be advantageous for spaces used for informal socializing be located closer to the residents' bedrooms.

Victor Regnier in his book, "Design for Assisted Living" **(2002)**, also supports shorter corridors. He indicates that there should be a bench or a chair every 10 to 12 metres [35 to 40 feet], and that corridors, without an offset, should be no longer than 10 to 12 metres. *"The single point perspective of a 30 metre-long [100 foot] corridor*

Hierarchy of space



can be overwhelming…. Asymmetrical corridor plans are more interesting than an orthogonal square and often aid orientation" **(Ibid., 2002).**

And this brings us to the issue of the physical layout of the House.

The Small House layout

Key elements to review for efficiency and effectiveness, or functionality, are the overall layout of Homes in terms of grouping of core services and amenities, location of bathing rooms, corridor length, and privacy zones. The functionality and co-location of components (i.e., amenities, etc.) is critical in reducing distances travelled, and facilitating wayfinding; probably the least successful in achieving this is a rectangle of rooms around a large courtyard.

In Larger Houses, layouts that work best utilize wing designs such as A, Y, V, T, X, H or L shapes with short corridors and amenities grouped together. A courtyard can work if shared by two U shaped Houses so that travel distances are minimized.

To function well the Homes need to be laid out in a way that organizes day-time amenity areas in an efficient way for staff and residents, provides a privacy zone for bedrooms and bathing, and keeps corridors short for the frail elderly, for wayfinding and for staff.

'Hierarchy of space'

Nelson in his article (2009) discusses a "hierarchy of Space" where movement is from a public zone, to a semi-public, to a semi-private, to a private zone. *(See illustration above).* The idea is to achieve short corridors with functional grouping of spaces. In particular, it is important in Larger Houses to achieve some physical sub-grouping within the House so that 7 to 12 residents can meet in more intimate social spaces.

The concept of the ***'Hierarchy of Space'*** refers to the progression of space in terms of access and activity by residents. The progression is defined using four different zones. Each of these zones moves progressively from the resident's control and safety of his/her private space, to increased opportunity for interaction with others. **(From:** Howell, S.A., Designing for Aging: Patterns of Use, Cambridge, Massachusetts: MIT Press, 1980.

Small house models

Small house layouts can be grouped into two sub-sets:

(1) Neighbourhood or Household Models, i.e., the Adard Model and Nelson's Creekview with linked groups; and

(2) Independent Small House Model of which the trademarked 'Green House' concept is the most predominant.

Several graphic examples of these two sub-sets of Small House designs are presented in the following pages, along with brief commentaries on each design.

Both the Small-House models and the Neighbourhood/Household models are emerging across Canada and are proving to be operationally feasible, particularly if linked or grouped together. More research is needed to compare capital and operating costs of these models with more traditional nursing homes. ■

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About the author

Bill Benbow, MSW, is a Development Consultant in Victoria. B.C. with experience and interest in facility functional programming and design guidelines.
Author contact: <billbenbow@shaw.ca>. and <www.wabenbow.com>.

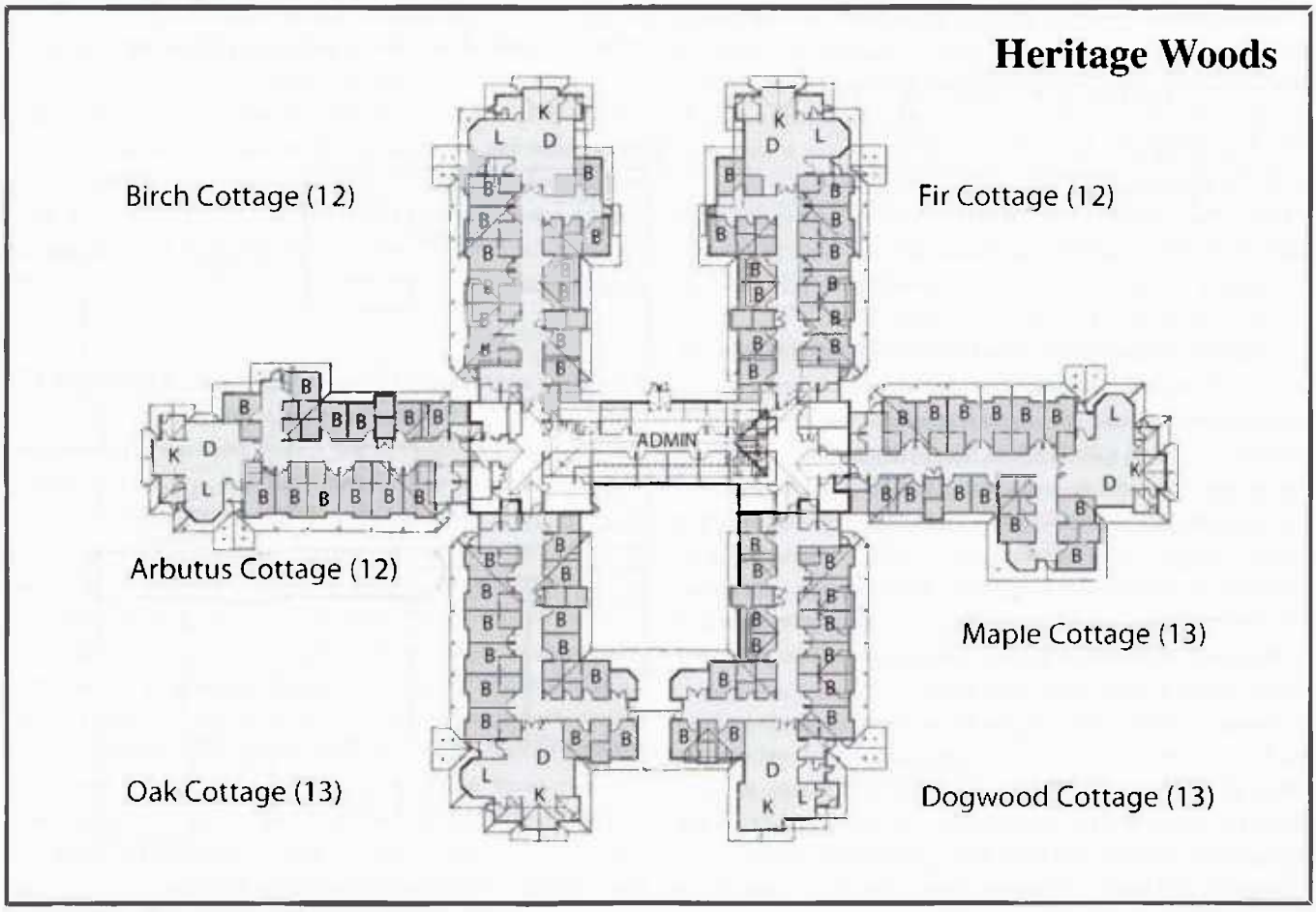
(1) Neighbourhood or Household Models

Heritage Woods, Victoria, B.C.

One of the original models for 'Neighbourhood' or Household Small House design is the Adard Model by Dr. Tooth of Australia. Originally built in 1991 in Tasmania, Australia, this design featured four wings or Houses of eight or nine resident rooms formed around a central administrative core. Each House was self-contained during the day time with its own lounge, dining, and kitchen areas. At night, staffing could be drastically reduced by opening the units up to the administrative core, and closing off the daytime amenities.

A good Canadian example of the Adard's Model is Heritage Woods in Victoria, B.C. **(Jensen Group Architects).** Six Cottages are linked to the central administrative core making for staff efficiencies **(below).**

Each Cottage/House has amenities grouped near a front entrance, with bedrooms in a more private zone. Food is delivered in bulk to be prepared and served in the six in-house kitchens and dining areas. Additional descriptions of Neighbourhood/Household Models are described on page 10: Creekview Model, Oshkosh, Wisconsin, and Windsor Elms Village, Falmouth, Nova Scotia.



Creekview Model, Oshkosh, Wisconsin

(www.evergreenoshkosh.com/main/living-options/skilled-nursing/creekview)

The Creekview Household model, opened in 1997 and expanded in 2005. It provides care for 80 residents in eight Households. The 9 to 11-resident bed rooms function as an independent Household with their own dining, as well as lounge and activity areas. Small kitchens act as serveries for plating bulk food as well as a Country Kitchen.

Two Households are linked into L shaped pairs, thereby allowing for privacy and easy staff movement between households.

The household's small scale, with its open floor plan, eliminates most corridor space and allows easy orientation to activities. The combined Households are again linked with another two Households to form a 4-Household unit with a Neighbourhood Centre. ■

Windsor Elms Village, Falmouth, Nova Scotia

(www.windsorelms.com/)

The Windsor Elms is a good Canadian example of the Creekview model **(Architect: William Nycum & Associates)**. The 108-bed complex, which opened in 2010, is a 'resident centred care' model with each house consisting of between 9 and 12 residents. This model of care results in short travel distances for residents between their bedrooms and the dining/living room areas. Pairs of houses are linked together by a passage to access the shared spa services.

New generic staff positions were developed to streamline staffing in order to make the model operationally cost effective. Again, corridors are short, and amenities are close with lounge, dining, and kitchen co-located. ■

(2) Independent Small-House models
The 'Green House' concept

(http://thegreenhouseproject.org/)

The Independent Small-House model (similar to the trademarked "Green House" concept) was developed by Harvard geriatrician, William Thomas of Mississippi.

A 'Green House' Home is an independent, self-contained living arrangement for six to 12 people, designed to look like a private home or apartment in the surrounding community.

'Green House' homes are typically licensed as certified nursing facilities, with each resident usually provided a private bedroom that opens to a central living area, an open kitchen and dining area. Residents may share meals at a common table, and family members, friends and staff are welcome to join the community at mealtimes and other activities.

Each Home is staffed by a team of care workers, most of whom are trained to perform multiple, self-managed tasks: meal preparation and related culinary skills, household management, personal care, light housekeeping and laundry, among other duties.

A clinical support team composed of registered nurses, social workers, therapists, physicians, activities and dietary professionals, and pharmacists visit the Homes regularly and as individual residents require on a 24/7 basis. A registered nurse typically covers two Homes during the day and evening, and up to three at night.

People who live and work in a Green House Home collaborate to create a daily routine that meets each resident's individual needs. Residents are encouraged to help cook, and assist with light housekeeping and laundry, although there is usually no predetermined routine for them. Residents are facilitated in their independence and in their ability to pursue individual interests.

One draw-back with the Green House model is that it tends to be designed to function independently in terms of staffing; so, operating efficiencies could be an issue. Also, there may be some privacy concerns as there is typically a minimal transition from the resident room-privacy zone to the more public amenities area.

These Small-House or "Green House' models also tend to be used more for enhanced assisted living and lighter levels of care, although this impediment is probably ovecome with highly-trained and dedicated care staff.

Linhaven Home
St. Catherines, Ontario

(www.niagararegion.ca/living/seniors/pdf/Linhaven-Brochure-nov-2005.pdf)

The Linhaven Home is another example of the Small House design **(Snyder and Associates Architects)**. Here the residents' rooms are grouped in two clusters of four bedrooms with both clusters opening onto a central living room and adjacent dining area. This addresses the issue of creating some transition from the private resident rooms to the more semi-private or public lounge areas. ■

Good Samaritan's Wedman Duplex, Alberta/B.C.

(http://www.gss.org/)

The Good Samaritans operate several Dementia Care Cottages in British Columbia and Alberta. They first opened three duplex style Dementia/Alzheimer Care Cottages adjacent to Wedman House in 1997 to house 30 residents. The cottages are co-located but not linked. The Wedman Model cottages provide assistance and residency for persons with Alzheimer's or other types of dementia.

Each side of the duplex has 5 bedrooms, kitchen, dining room, living room with fireplace and secure access to a fenced yard. Initially these cottages were designed as Enhanced Assisted Living Homes with each group of residents sharing one washroom.

In more recent designs, such as in Vernon, B.C., they have made 12 and 14 bed cottages that are full Complex Care with larger rooms and ensuites for each resident bedroom. ***(See next two pages for more models of independent small-house models).*** ■

Protem Health Services, Moncton, NB

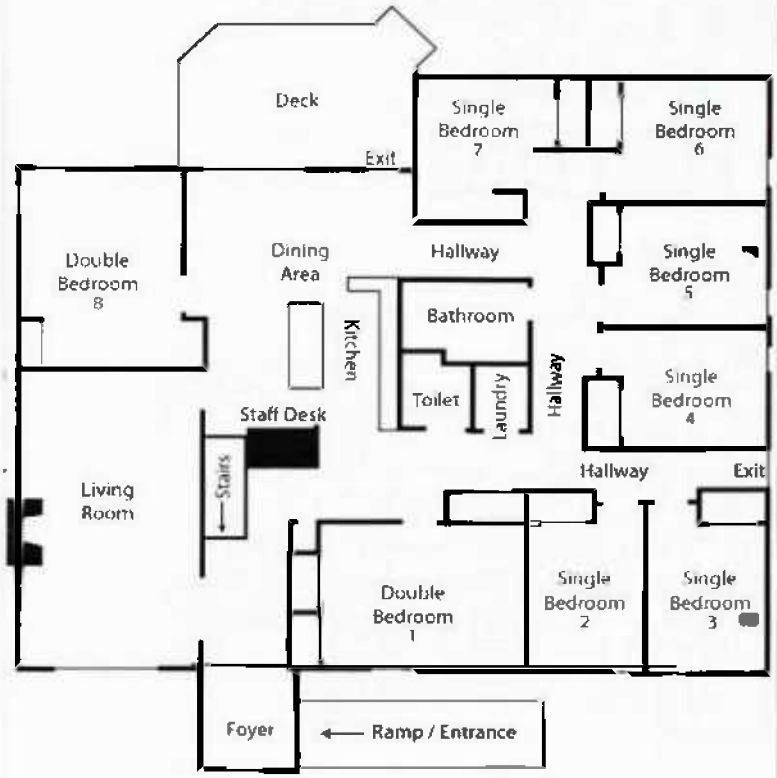
(http://www.protem.ca/)

Protem Health Services operates five Small-House type homes for residents with dementia. One of the 'Small Houses' is shown with its floor plan below.

Protem Health Services has found that ten is the ideal size for the client group cared for. The five houses, though not linked together, are all within five blocks of each other in a residential neighbourhood in Moncton. As Independent Houses, they are highly staff intensive (staff to resident ratio of 1:3 on days, and 1:10 at night).

It should be noted that floor plans at Protem are similar to the "Green House" concept, with increased transition between the private and semi-private areas. Toileting facilities appear limited, and the size of the rooms suggests this House is not wheelchair accessible, so possibly not full complex care.

Protem Health



Basic design guidelines for care facilities

- *The facility is 'Home' to residents and should therefore display a homelike environment which engenders a sense of belonging, familiarity, safety, comfort and care.*
- *Although it is essential that the environment be therapeutic and facilitate resident care, its ambience should de-emphasise any associated institutional characteristics.*
- *The interface between staff-only use spaces and resident use spaces shall be designed to emphasise a 'homelike' living environment. Rooms and spaces used specifically for staff and utilities functions, therapies, storage of equipment, etc., should not be exposed directly to resident use spaces.*
- *Maximise the limited opportunities for residents to personalise their private spaces. Bedrooms should include facilities for display of personal pictures, photographs, ornaments, etc. Visitors need to be able to sense that they are being welcomed into a 'home' rather than an institution. This should engender a relaxed and friendly attitude which is helpful to the well-being of residents and encourages increased visitation.*
- *Public entrances to the grounds and buildings need to reflect a low-key residential character rather than commercial. 'First impressions' given by the entry areas should emphasise a caring and secure domestic environment.*

From: Design Guidelines for Queensland (Australia) Residential Aged Care Facilities

What is a Country Kitchen?

A Country Kitchen design takes a step back in time to an informal, relaxed atmosphere that attempts to mimic the feel of an old-style farmhouse. Modern appliances and amenities may be used, but the fixtures and overall feel should remain rustic, open and engaging.

Sherbrook Kinsman and Veterans Village, Saskatoon, Saskatchewan

(www.sherbrookecommunitycentre.ca/exploring.php?id=321)

See illustrations on following page

Sherbrook has combined 11 "Green Houses" into two villages, the Kinsmen and the Veterans, with a total of 103 residents. The Houses are paired, which is a good model for achieving staffing efficiencies and sharing support utilities. The link is actually a service corridor with storage rooms, a housekeeping room, and a tub room.

The Houses are grouped along an internal street that simulates a residential neighbourhood. The care assistants multitask their caring roles, participating in housekeeping, food service, medication administration and personal care.

Registered nurses, and other medical professionals as required, function like home-care visitors. At night, staffing is shared between pairs of houses, for example, with four staff covering the seven houses (houses1 to 7) in the Kinsmen Village grouping.

Sherbrook Kinsman and Veterans Village Saskatoon, Sask.
(Inset below shows entire complex)