SENSORY ENHANCEMENT: A LANDSCAPE STRATEGY FOR THE ELDERLY

BY

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A Practicum
Submitted to the Faculty of Graduate Studies
in Partial Fulfilment of the Requirements
for the Degree of

MASTER OF LANDSCAPE ARCHITECTURE

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Abstract

Environments for the elderly have become a major concern in our aging society. Previous studies and ongoing research have focussed on the elderly and their environments, with subsequent guidelines recommended for the planning and design to improve the quality of life of the elderly person. Based on the belief that quality of life is affected by ones environment and interaction with the environment, exterior environments can extend, complement, and add complexity to the lives of the elderly.

This practicum identifies and examines the issues involved in designing environments for elderly people living in Personal Care Homes. Based on those issues, a conceptual design for the exterior landscape surrounding the Betel Personal Care Home in Gimli, Manitoba is proposed. The main focus of the design proposal is to create a landscape designed for the sensory enhancement of the elderly that addresses the problems of the deteriorating senses associated with aging, which in turn affect behavior and perception. The design proposal also addresses multi-level use requirements for individuals and groups, accommodates varying degrees of disabilities afflicting residents and attempts to encourage and to facilitate a relationship between the Betel Personal Care Home and the community.

Acknowledgements

I wish to express my appreciation to my advisory committee head Professor Charlie Thomsen for his guidance and encouragement and to my other committee members Professor Ted McLachlan and Professor Carl Nelson for their input.

I wish to thank Mr. Bruce, director of the Gimli Betel Care Home for his co-operation and help.

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Introduction

The potential of the surrounding exterior landscapes of personal care homes have in general been overlooked as extensions of therapeutic living environments for elderly residents. Many of these exterior spaces surrounding personal care homes are 'dressed up' but are non-functional and non-accessible to the residents.

> ...those who study aging are gradually coming to understand that the environment is not simply the backdrop, the 'scenery' against which the lives of older persons are lived.[1]

The Betel Personal Care Home, chosen as the study site for this practicum, has developed a small portion of its exterior landscape by providing an outdoor patio for dining in a courtyard setting. They have also added 'decorative' tree and shrub planting around the entrance/drop-off area as well as around the residential wings of the building (*refer to figure 1*). The entrance area and the courtyard are the only exterior spaces accessible to all residents. Many of the residents, as a result of physical and mental limitations are

restricted to the immediate surroundings of the home. Due to this limited range, this surrounding environment takes on a greater importance then it would otherwise.

Feelings of loss of independence and decreasing choice can develop in elderly individuals as a direct consequence of the aging process. The gradual loss of capacities should not be dealt with by reducing opportunities within the environment. In order to arrest further decline and give back some of life's meaning to the residents of care homes it is necessary to, through appropriate design of the environment, add richness, stimulation, aesthetic experience, meaning and memory, ritual and normal daily activity (Spivack, 1984).

> ...the essential concept is that design of micro-environments for the aged must be aimed not only at ameliorating stresses, minimizing the effects of losses, and compensating for deficits but must do so in ways which enhance the individuals' effectiveness, support their competence, and thus help them maintain self-esteem.[2]

[1] Schwartz, Arthur N. "Planning Micro-Environments for the Aged" in Aging: Scientific Perspectives and Social Issues. Eds., Woodruff, Diane S. and Birren, James E., New York, N.Y.: D. Van Nostrand Company, 1975, p. 281.

[2] Schwartz, Arthur N., p. 289.

1ST AVENUE

0 10 20 30 40 50 m

Breakwater

LAKE WINNIPEG

Visitor Parking

Drop-off

Deciduous Tree

Coniferous Tree

N

BETEL CARE HOME

Staff Parking

Light Standard

Shed

Viking Statue

Patio/Courtyard
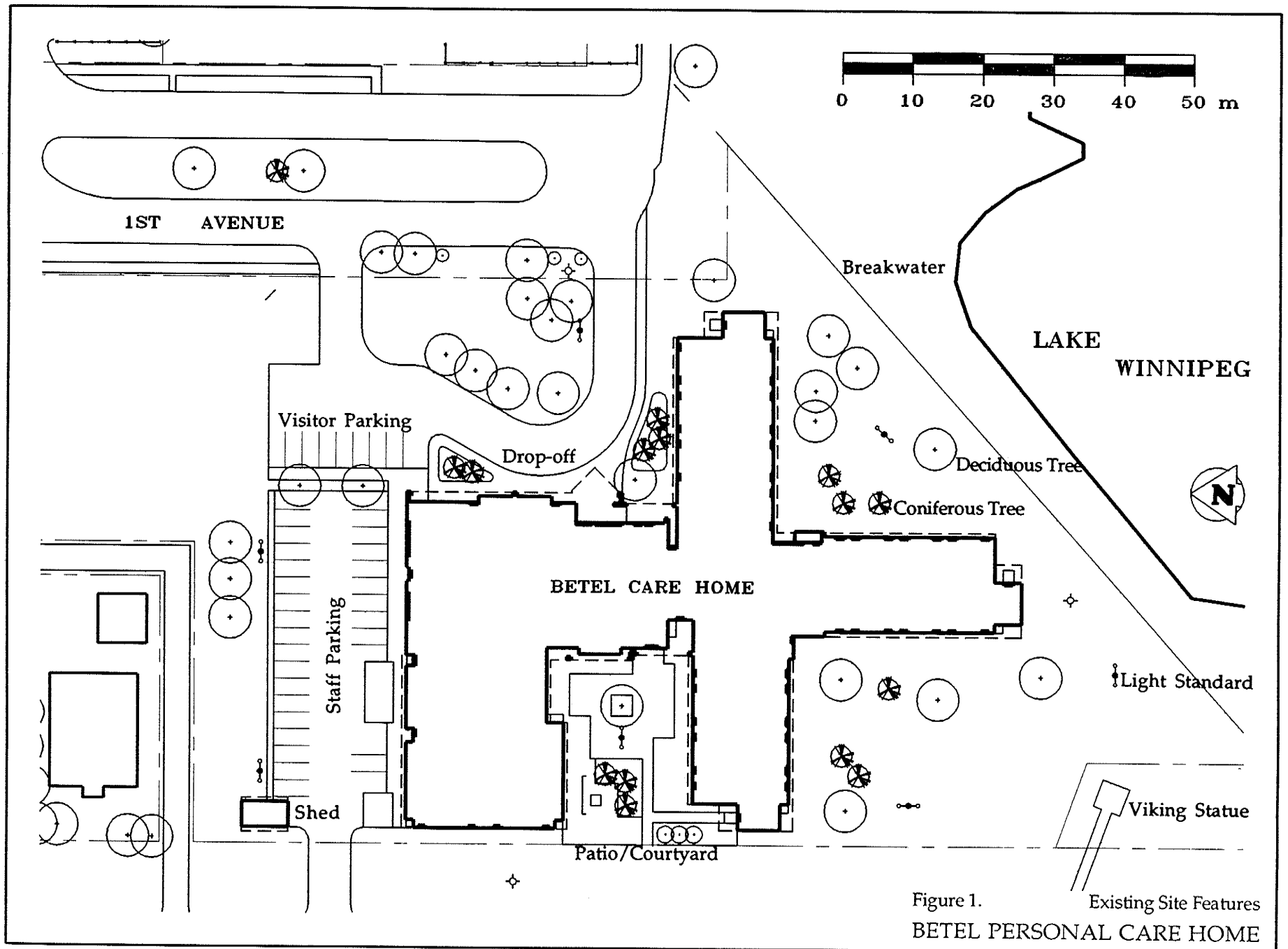
Figure 1.

Existing Site Features

BETEL PERSONAL CARE HOME

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Issues

The main issues that this practicum addresses in the design process and proposal are:

- the physical and psychological changes of the elderly due to the natural affects of aging; sensory loss, decline in mobility, mental deterioration.

- how the surrounding environment can relieve some of the stress due to these changes associated with elderly through barrier free access and sensory enhancement.

- the needs and desires of the residents.

It is important to recognize that human response (behavior) is a product of the environment in which we live (Lowenthal, 1967). That response is derived through the perception of the environment and that perception is achieved through the senses. Since aging greatly affects the senses, aging also affects perception and behavior. The surrounding environment can be enhanced to create a world which is stimulating to the participant and to some degree compensate for deteriorating senses and make the difference between healthy or ill, competent or incompetent, oriented or confused, satisfied or unsatisfied elderly residents (Schwartz, 1975).

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Goals and Objectives

The goal of this practicum is to present a design concept for a therapeutic exterior landscape for the Betel Personal Care Home that compensates for the physical, mental and sensory loss of the elderly. The proposal will provide a more complete living environment for the residents. For a number of people a view from a window, the smell of a flower, the touch of a leaf, the sound of a bird makes life worth living.

The following objectives were formulated through observation and analysis of the site, discussions with the director of the Betel Home and a literature review of issues facing the elderly and the care homes in which they reside. The objectives provide a guideline for the design process to achieve the final goal of a sensory enhanced therapeutic landscape that addresses the needs and desires of the residents and the Home.

1. To review literature and guidelines associated with:
   • Personal Care Homes
   • barrier free design
   • issues facing the elderly

in order to facilitate in the design process to produce a landscape proposal that addresses the issues of elderly residents of the Betel Personal Care Home.

2. To add challenge, opportunity, choice and diversity to the home of the residents by extending the interior living environment out into the exterior landscape.

3. To place the exterior environment of the Home within reach of the residents, physically and mentally, through barrier free design and creating a landscape for the sensory enhancement of the elderly.

4. To encourage interaction and participation between the surrounding community and the residents through creation of an environment which encourages and facilitates social interaction.

5. To encourage passive and active recreation by offering diverse and challenging environments.

6. To provide a restorative and calming landscape for confused and disoriented residents.

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Process

This practicum began with a review of literature on a general topic area of personal interest; elderly people and their surrounding environments (refer to Appendix E, Annotated Bibliography, p. E1). From this background research, attention shifted to a more focussed topic; the design of environments for the sensory enhancement of the elderly (refer to Bibliography, p. 63).

The Betel Personal Care Home situated in Gimli, Manitoba was chosen as the case study for implementation of design issues and guidelines . The Administration of the Home was then approached for consultation on resident profiles, needs and requirements of the Home and its goals for the outdoor landscape. Based on the literature review and discussions with the Director of the Home and the Activity Director on specific concerns regarding outdoor activities, space limitations and resident limitations, the objectives (previously outlined) were reached.

Analysis of the site (physical characteristics) was undertaken investigating the wind, sun, access points, landforms, and context. Design criteria was analyzed for functional relationships, views, handicap accessibility and context (physical and historical).

A programme was compiled through discussions with the director of Betel Home based on:

1. needs and desires of the residents.
2. physical limitations of the residents.
3. spatial constraints of the site.

A synthesis of the above established the basic criteria for a conceptual design. This is based on the pertinent information of issues, objectives, needs and desires of the residents, history of the home and community, physical constraints and possibilities as well as context of the site, and observations. The descriptions, following the analysis, detail the design approach in satisfying the objectives of this design proposal.

Background

The following is background information that is important to understand in order to set the foundation for issues, and objectives for the design of the exterior landscape for the Betel Home.

Personal Care Homes

According to the Canadian Mortgage and Housing Corporation (CMHC), personal care homes are group living settings which provide shared personal care services and access to health care services. These homes are for elderly people, usually 75 or over, or those who require assistance in their personal care regime in order to carry on activities associated with daily living: dressing, grooming, bathing, eating and moving about. Health services that are provided include special diets, medication, medical dressings and physiotherapy (1979).

The intent of personal care homes is to encourage and maintain the highest level of independence each resident can achieve through their physical, mental and social abilities. Besides meeting the basic physical needs, the home also has to meet the psychological needs of the residents by providing a stimulating and challenging living environment, in order for the residents to maintain a sense of 'self-worth' and give purpose to their lives. To this end, they require the full support of care home, family and community.

The environment must not "penalize" the aged person for his deficits, to be sure; it must also be reasonably barrier-free. But more than that, the environment must be designed not only to make life "possible" but also to make life worthwhile. The environment must maintain beauty (or bring beauty back if it has been missing); it must overcome the filtering effects of possibly increasingly defective senses (vision, hearing, taste, touch, smell) by increasing the amount and intensity of environmental stimulation and impact; it must provide real options and thus the possibility of real choice (not the least of which is the privacy option); it must provide for relatively easy negotiation of space through clarity of space and extensive use of "readable" environmental cues; it must help maintain at least a modicum of familiar life style and provide some incentives for modification and growth; it must provide continuing

opportunities and mechanisms for activity which can be both taken seriously and found personally rewarding by the individual; it must make involvement in the ebb and flow of daily living gratifying and reassuring rather than anxiety arousing; finally, it must offer variety and adventure within limits that are satisfying to the individual.[3]

The personal care home must address the complete needs of its residents since to many of the residents it is their entire living environment; the only environment they are capable or able to experience on a regular basis.

Physiological Changes Due to Aging

The following is a discussion of some of the physiological changes due to aging that must be taken into consideration when designing a personal care home for the elderly.

There is a slow decrease in function of the entire body with age. However, there is a more noticeable decline in complex functions which eventually requires greater coordination of muscle and senses. There is also a decrease in the ability to cope with stress and to return intact to the pre-stress level (Weg, 1975). Because of these and other factors, the elderly are more vulnerable to both acute[4] and chronic[5] illness. Health decline in advancing age is usually the result of chronic rather than acute health problems (Butler and Newcheck, 1981). Chronic health problems are one of the main reasons that the elderly turn to care homes for their home environment.

There is also considerable individual difference in all physiological aspects of aging. People are a product of

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[3] Schwartz, Arthur N., pp. 291-292.

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[4] acute: severe: rising rapidly to a peak then subsiding
[5] chronic: marked by long duration or frequent recurrence
Source: The Merriam-Webster Dictionary. 1974.

their environment, their heredity and their lifestyle. The age of onset and rate of decline due to illness, disorders or general decrease in function differ with each individual and do not affect all elderly the same.

The most prevalent chronic disorders that lead to impaired functioning among the elderly are heart disease, hypertension and stroke, cancer, arthritis, osteoperosis, sensory impairment, mental deterioration and depression (Blackburn, 1988). These disorders can cause varying degrees of damage to motor function, sensory perception, mental capacity and functional capacity.

> Most older people cope with declines in their health. They accept the health changes that come with age, adjust their expectations about their activities, and gradually make changes in their lives to cope with physical decline.[6]

However, some elderly people find that they require more help than can be given in their own homes and approximately 10% of the elderly population in Canada find themselves in personal care homes. Reasons given for such moves are varied; the need for services,

change in family or community support, loneliness, as well as a desire not to be a burden on family or friends. The following is a discussion of physiological changes that affect the elderly:

Physical Capacity

Physical changes over time are the outwardly noticeable aspects of aging. All physical changes can be attributed to the bodies decrease in the ability to replace or regenerate lost tissue. Certain physical changes must be considered when creating a healthy environment for the elderly:

Changes in Bone - There is a general decrease in bone mass, the entire frame settles, becomes less flexible and more brittle. Bones lose their elasticity and tolerance of stress. Arthritic conditions are associated with this deterioration and fractures are also very common, both causing numerous disabilities.

Changes in Muscle - There is a loss of muscle size and strength, and also of connective tissue. Much of this loss may be due to normal decrease in activities or a decrease in activity as a result of some affliction such as

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[6] Chappel, Strain and Blanford, 1986, p 37.

arthritis. Tasks take longer to do and the elderly become weaker over time. Exercise minimizes loss of strength, endurance and agility.

Changes in Tissue - Most tissues thin with age. Skin, the bodies largest organ, thins with age and becomes less able to release heat and moisture and is therefore less efficient at cooling the body (Weg, 1975). Relief from the sun takes on greater importance during the hot days of summer.

Sensory Capacity

Sensory systems are 'links' that connect the outside world with the brain. They are the means by which we perceive the environment, through physical sensation: visual, auditory, olfactory, tactile and taste. People experience gradual changes in their senses with aging and therefore changes in their perception of the environment. There is a built in capacity to compensate for loss in sensory acuity. The use of a number of different sensory information systems augments failing senses. For instance one becomes more dependent on visual cues if there is deterioration in hearing.

Sensory systems play a vital role in imitating, maintaining and directing motor responses from simple reflex activity to so called complex perceptual motor skills.[7]

The following is a breakdown of age related sensory change.

Sight - With age, visual acuity decreases. In many cases the eye loses the ability to focus and this leads to farsightedness which can be corrected through the use of eye glasses. Disorientation may also result from loss of visual acuity. Other changes in vision that may occur:

1. The lens of the eye yellows causing a change in the perception of colour; reds, yellows and oranges are more clear, while blues, greens and violets are more difficult to discern. Varying degrees of intensities of these particular colours can help to distinguish themselves amongst each other.

2. Cataracts, a clouding of the lens of the eye, form and interfere with the passage of light; brighter

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[7] Ordy, J. Mark and Brizzee, Ken R. eds. Sensory Systems and Communication in the Elderly. New York, N.Y.: Raven Press, 1979, p. 7.

light is required to distinguish objects more clearly, although glare becomes a problem in bright light (see #6).

3. Glaucoma, a disease of the eye in which pressure caused by fluid buildup within the eye damages the optic nerves, resulting in a loss of peripheral vision which in turn affects spatial perception. Glaucoma is a common cause of blindness.

4. Loss of central vision can occur; details in the environment are lost.

5. Adaptation to light change is slower.

6. Sensitivity to glare increases.

Hearing - There is a gradual loss of hearing with time. There is often a greater loss of higher frequency sounds than lower frequency sounds. Many types of hearing loss can be corrected with the use of hearing aids. However with a hearing aid, background noise can become difficult to block out and many sounds become indistinguishable.

Smell - There is a decrease in olfactory capacity with age, often thirty to fifty percent (Ordy, 1979). Higher levels of stimulation are required to equal the same environmental experience as that of a younger person.

Touch - There is a decline in touch sensitivity and an increase in pain threshold with aging.

Taste - There is a large decrease in taste sensitivity with aging.

Mental Capacity

Along with physical and sensory changes, changes resulting in mental problems are also prevalent among the elderly. There is considerable individual difference in the aging of the brain and the nerves transmitting information to the brain. Environment, heredity, lifestyle and nutrition all play a role in why some people experience changes in mental acuity while others do not.

Some of the more common changes in mental acuity are as follows:

Memory Loss - Short term memory loss or 'absentmindedness' is quite common among the aged. Alzheimers disease is also quite prevalent. The

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residents of a home suffering from these afflictions need to either have constant supervision or an

enclosed space (interior or exterior) in which they cannot wander off and become lost.

Disorientation - Disorientation in time and place occurs frequently in some of the elderly when subject to stress.

Mental Deterioration - An actual change in brain function, resulting in dementia (mental deterioration) or some degree of insanity (Chilman, 1988).

Depression - Probably the most prevalent mental problem of the elderly. Depression can be caused by a variety of situations and can be attributed to such things as physical deterioration, loss of independence, loneliness, etc.

Coordination

The loss of the ability to coordinate the muscles, a decrease in nerves and tissue and the resulting loss in motor function affects the bodies efficiency and ability to perform daily tasks. Changes in motor performance cause hesitancy, slower reaction time, reduced mobility and flexibility.

Life Change

Life change is defined as any major change in ones life that may cause high stress, such as a death in the family, loss of a job, a move, etc. Life changes may play a large role in contributing to the rate of aging and susceptibility to disease.

> The aged in contemporary society experience a great many changes, perhaps more than other groups: change in living arrangements, loss of job, decrease in income, loss of status, loss of friends and relatives, loss of identity, and often a decline of former physical capacities. It appears conceivable then that these multiple changes represent mounting stress that finally taxes homeostasis and coping abilities to the limit, leading to the breakdown of adaptability and to disease.[8]

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[8] Weg, Ruth B. "Changing Physiology of Aging: Normal and Pathological" in Aging: Scientific Perspectives and Social Issues. Eds., Woodruff, Diane S. and Birren, James E., New York, N.Y.: D Van Nostrand Company, 1975, p. 245.

Of course one of lifes major changes occurs when an elderly person moves from their previous home into a personal care home. The environment of the care home can have a great affect on that person. It can help to minimize the stress from the life changes or increase the stress, depending on how the environment has been handled.

Changes in physical capacity, sensory capacity, mental capacity, coordination and life change due to aging must be considered when designing effective, barrier free environments for the elderly. The types of changes and considerations taken in the design process will be discussed in the Conceptual Development chapter of this practicum.

Accessibility

In order to add diversity, richness and stimulation, and encourage participation in the environment, designers have to create an accessible and manageable space for independent use by all people, regardless of their abilities. People throughout their lives at some time or another encounter difficulties negotiating the environment. While those experiences are often short lived inconveniences, by the time an elderly individual becomes a resident of a personal care home, barriers become permanent deterrents to the use of a particular space. Independence is diminished when there is no reason it should.

A large diversity in abilities can be found among the residents of the Home. Two main classifications with respect to physical limitation stand out:

1. Visual impairment
   - ranging from partial loss of vision to total blindness.
   - reduced perception, due to visual impairment.

2. Mobility impairment
   - reduced mobility, co-ordination or flexibility.
   - Non-ambulatory disabilities: those which confine individuals to wheelchairs.
   - Semi-ambulatory disabilities: such as arthritis, lack of ambulatory skills which impair walking, or disabilities requiring the use of aids such as canes.

It should be noted that it is not uncommon to find that combinations of these impairments occur in individuals which each has to deal with on a day to day basis. The design process needs to address these issues in order to minimize environmental barriers and encourage independence and participation in a safe and enjoyable environment.

To address these issues, consideration has to be given to the anthropomorphics of the disabled: reach limitations, circulation space, surfacing material, grade change requirements, and sizing of site furnishings. For example, wheel chair users require a larger spaces to manipulate in and find standard heights for tables, planters and barbeques inappropriate as compared to requirements for mobile individuals. For visual impairment use of tactile clues can be used as indicators in the environment to aid in negotiation.[9]

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[9] Refer to Appendix A for dimensioning considerations for accessibility in outdoor environments.

User Profile

People moving into the Betel Home typically move in to live there for the rest of their lives. The personal care home becomes their 'home' in the true sense of the word; in most cases there will be no future change in home location. New residents have to deal emotionally with: the loss of their previous home environment; the continuing decrease of senses and mobility as well as their new institutional home environment. The surrounding environment should welcome and comfort the individual as much as possible by providing opportunities for privacy, social interaction and participation in the Home activities.

The users of these environments would include:

1. Residents who require minimal care and who come and go as they please. These residents are located on the main floor of the residential wings.

2. Residents who are under constant supervision and care. These residents are located on the second floor of the residential wings.

3. Visitors to the Home; family and friends of the residents.

4. Staff and volunteers who interact with the residents (equivalent to 66 full time personal). The staff consists of nurses, doctors, pharmacist, therapists, nurses aids, activity director and volunteers. Nurses are on shift basis, where as the rest of the staff would be on regular work hours from Monday to Friday with occasional evening hours from volunteers.

Resident Profile
The following is a general profile of the type of elderly residing at the Betel Home during the fall of 1991:

Number of Residents: 80

Age: The average age is 86 years.

Sex Ratio: Two thirds of the residents are women.

Orientation/Behavior: Approximately 40% are disoriented (unaware of time, place and their identity) and about half of these are 'wanderers'.

Sight: Four of the residents are legally blind. Almost all of the residents have some visual impairment.

Hearing: One third of the residents have some hearing impairment.

Mobility: Approximately half of the residents are either wheelchair bound or use mechanical aids such as canes or walkers to get around. Of these, approximately 20 remain in there room or are bed ridden most of the time.

Illness: The most common illnesses among the residents are:
- Arthritis
- Heart Disease
- Neurological Disease

Length of Stay: The length of stay in the past for residents has been as short as three years and as long as sixteen years.

Ethnicity: Approximately 55% of the residents are of Icelandic origin.

All of the statistics noted above change constantly. Mobility and access, security and safety are always a concern among the residents and the Home.

Programme

A programme was listed based on:

1. Discussions with the director of the Betel Home who listed needs and desires of the residents and requirements of the Home.

2. Suggestions and guidelines for personal care homes from research material.

The list is comprised of a diverse number of types of spaces, activities and events for the sole purpose of enriching the environment, adding choice and encouraging participation within the environment for all of the residents.

Types of Spaces

1. Garden area - for viewing, socializing, gardening (individuals and small groups (10-12 people).

2. Barbeque area - for large groups (60+ people).

3. Sheltered area - shelter from wind and sun.

4. Visiting area - for small groups - friends and family.

5. Entertainment area - for watching and listening to concerts, readings, plays (medium size groups 10-20 people).

6. Meeting area - between the community and the Home.

Activities

1. Passive Recreation
   sitting (reading, watching)
   socializing (visiting)
   table games (cards, chess, backgammon, etc.)
   bingo
   entertainment (concerts, readings, plays)
   monthly birthday parties
   eating (bbq, picnic)
   crafts
   gardening

2. Therapy
   exercise (walking etc.)
   discussions/readings
   classes

Concerns

1. Accessibility and negotiation of spaces

2. Security and safety

Community & Site Analysis

The following inventory and analysis of the site and its context will help in gaining a comprehensive understanding of opportunities and constraints surrounding the site.

Historical Context

Community Background

The site of the Betel Personal Care Home is located in the town of Gimli, Manitoba. The town, population 1,500, is situated 100 km north of Winnipeg along the western shore of Lake Winnipeg (*refer to figure 2*). The following is a brief history of the town and its surroundings.

The area was nicknamed the New Iceland when it was settled in 1875 by Icelandic immigrants. At that time, the area was still part of the Northwest Territories north of the province of Manitoba. The Icelandic immigrants chose the area for the rich soils, wooded forests, abundances of fish and sufficient quantities of free land available for future immigrants. The area
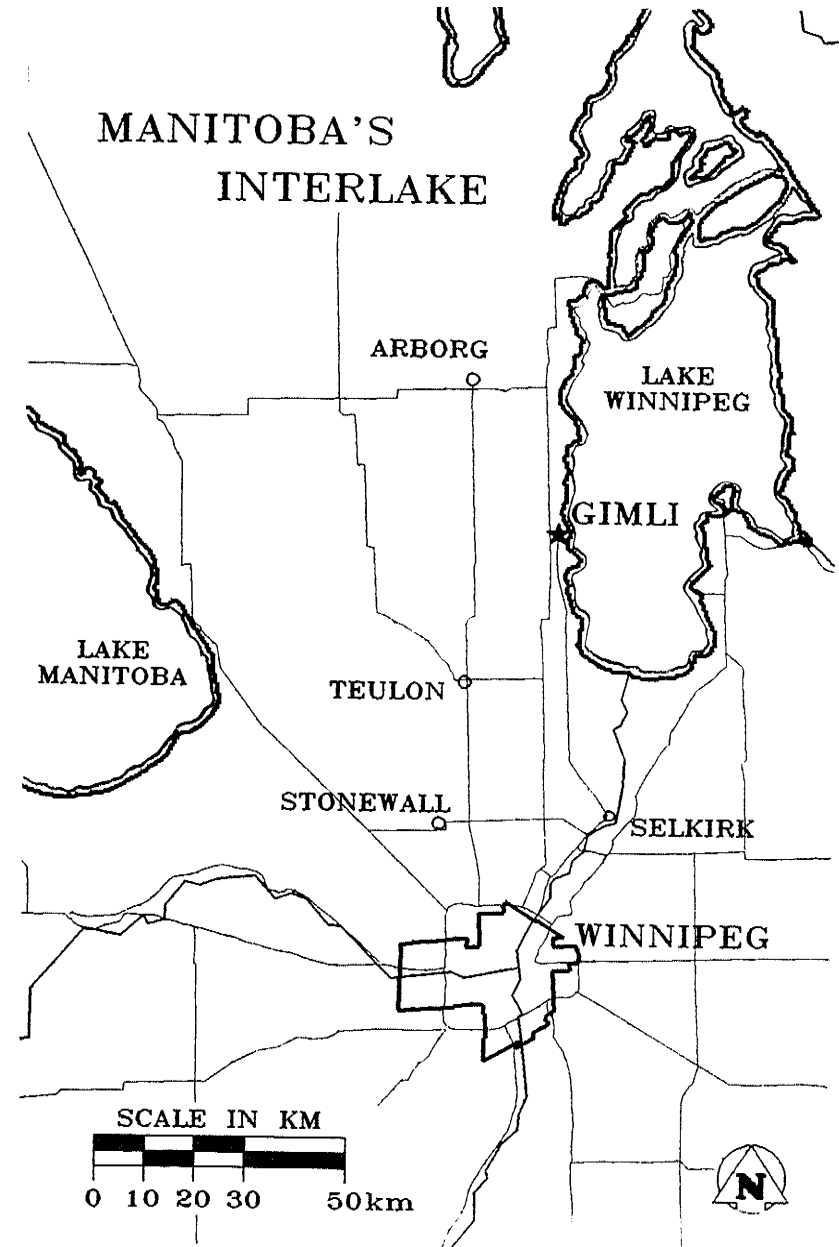
Figure 2   Location Map, Manitoba's Interlake and Gimli

was reserved for the Icelandic in hopes of attracting more Icelandic Immigrants.

Population numbers of the Icelandic community fluctuated in the first ten years of settlement and the area was eventually opened to settlers of varying cultural backgrounds in 1897. Many Ukrainians, along with Polish and Hungarians, moved into the area following this period.

The area has never had an abundance of wealth. However, the economics of the area has remained relatively stable, relying heavily on the fishing trade established in the early years of settlement. Tourism has brought in welcomed dollars to the area in recent years and numerous summer homes have been built since World War II.

The Betel Personal Care Home

The Betel Care Home arose from the compassion and concern of the settlers for the less fortunate among them. The home was founded in the spring of 1915 by the Ladies' Aid of the First Lutheran Church of Winnipeg. The first residents consisted entirely of
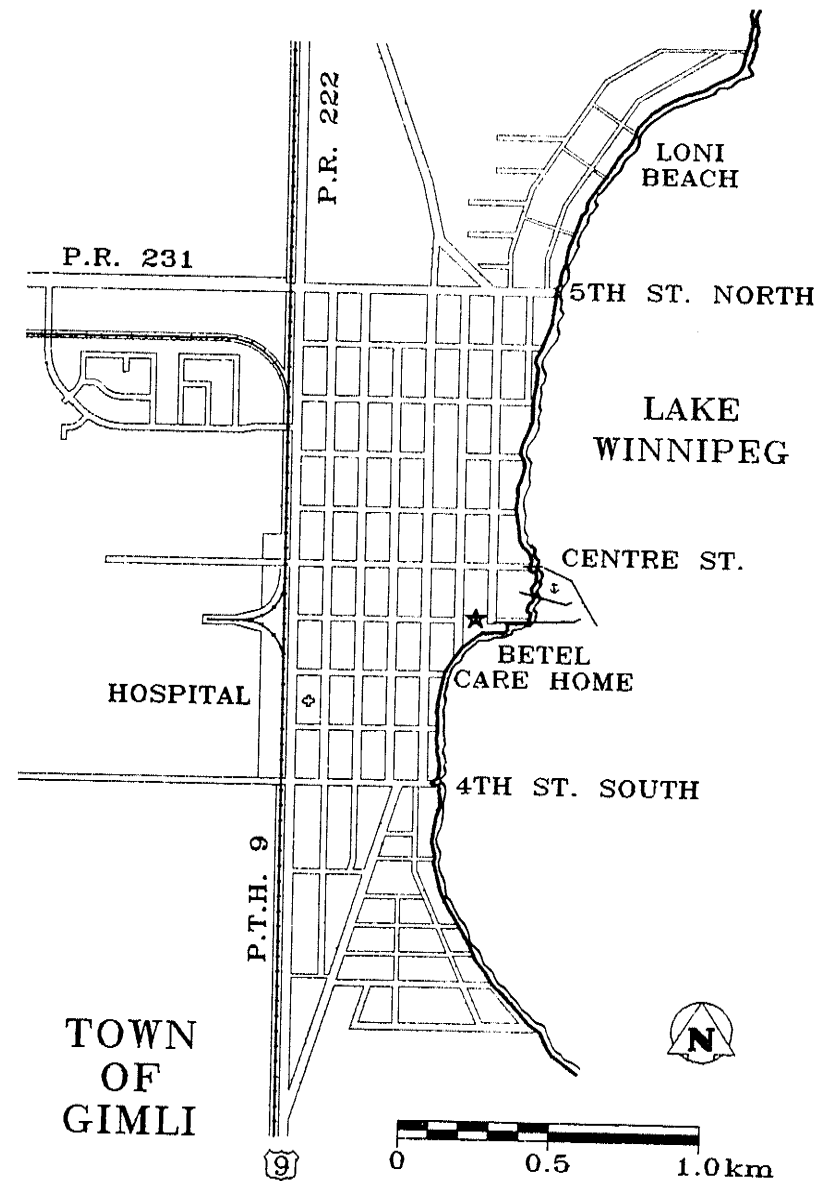
Figure 3   Map of Gimli, Site Location

people of Icelandic origin and were housed in rented quarters in Winnipeg. Even at this time, a more natural landscape was believed to be restorative to people and it was decided that the rural setting of Gimli would be more appropriate.

> The quieter and more peaceful environment would be better
> for the residents than the noise and confusion of the city.[10]

In the fall of the same year the residents were moved into the first Betel Home in Gimli. The lands surrounding the home were turned into a small farm with cattle, poultry and a large sized garden. Those residents that were physically able maintained the animals and garden to help provide the home with vegetables, dairy products and eggs. The residents were moved once again in 1917 to the former Lakeview Hotel (*refer to figure 4*) which was located at the present site of the Betel Home (*refer to figure 3*).

> (The) large verandahs on the east and south sides of the two
> lower storeys of the hotel would afford excellent places to sit
> and enjoy the sun and scenery as well as to visit and chat with

friends during the warm summer days."[11]

From its inception the intent of the home has been to help the aged and infirm. The home has expanded from providing the basics of food and shelter to providing personal and health care with state of the art technology. As well, providing a healthy, stimulating physical and mental environment is now seen as being as equally important as providing the basics of food, shelter and medical attention.

Figure 4   The Gimli Betel Home, circa 1915

source : BETEL 1915 - 1975, p. 5

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[10] Goodridge, Ingibjorg S. Betel: 1915 - 1975. Winnipeg, MB: Gardar Printing Limited, 1975, p. 6.

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[11] Goodridge, Ingibjorg S., p. 7.

During the mid 1970's, the Home was opened to people of all ethnic backgrounds due to regulations in funding by the provincial and federal governments. The present Betel Home was built in 1989 with government aid (*refer to Figure 5*).

Figure 5   The Gimli Betel Home, 1991

Site Inventory and Analysis

Site Context

The Home is located one block south of Centre Street, adjacent to the shore of Lake Winnipeg, between 1st and 2nd Avenue (*refer to figure 6*). Centre Street is Gimli's major commercial strip, with banking, general stores, and restaurants, running between Highway #9 and Lake Winnipeg. The Betel Home is surrounded by residential dwellings. Two senior's apartments face the Home, one on 1st Avenue across from the main entrance and the other located on 2nd Avenue facing the northwest corner of the Home that serves as the parking lot and service area. There are numerous single detached homes along 2nd Avenue and to the North, between the Home and Centre Street. The only commercial building in close proximity to the home is situated across from the entrance on 1st Avenue, the Gimli Yacht Club.

Pedestrian and vehicular access, and visitor parking to Betel Home is accessed from 1st Avenue. At present the street has low traffic volume. However this will change in the future with the construction of a parking

LEGEND

☐ COMMERCIAL
☐ RESIDENTIAL
▨ RECREATIONAL
▩ SITE

N

MARINE MUSEUM
HASTIES HOBBIES
ART CLUB
GIMLI YACHT CLUB
COUNTRY HOSPITALITY RESORT
LAKE 'N STEAK DINER
LANDMARK SENIORS APARTMENTS

1ST AVENUE

BANK
L.G.A.
INTERLAKE PUBLISHING LTD.
CENTRE STREET
H.P. TERGESEN GENERAL MERCHANT
GIMLI HOTEL

LAKE WINNIPEG

BETEL CARE HOME

2ND AVENUE

STRIP MALL
ESSO
DUMA COLOUR SERVICE
SENIORS LODGE
1ST STREET SOUTH

0 10 20 30 40 50m

Figure 6   Context Map
BETEL PERSONAL CARE HOME

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lot planned by the Town of Gimli to the east of the Home.

Existing Conditions

The space surrounding the Home is defined by the vertical and horizontal surfaces of the surrounding buildings, vegetation, the Home itself, as well as the horizontal surface of Lake Winnipeg. The figure/ground relationship (*refer to figure 7*) illustrates the footprints of the surrounding buildings and gives a feeling of the spaces in relationship to the buildings and vegetation. The aerial perspective (*refer to figure 8*) goes one step further to define the open space among the built form, both in scale and in massing.

Areas of the site have been developed as noted previously: hard landscaping consisting of parking and drop-off area, a courtyard patio adjacent to the dining room, and 'decorative' soft landscaping features, mainly around the entrance/drop-off area. The other element located on the site is a monument dedicated to the Icelandic settlers of the area in the form of a Viking Explorer. This monument is located in the southwest corner of the site. All these elements have

LAKE WINNIPEG
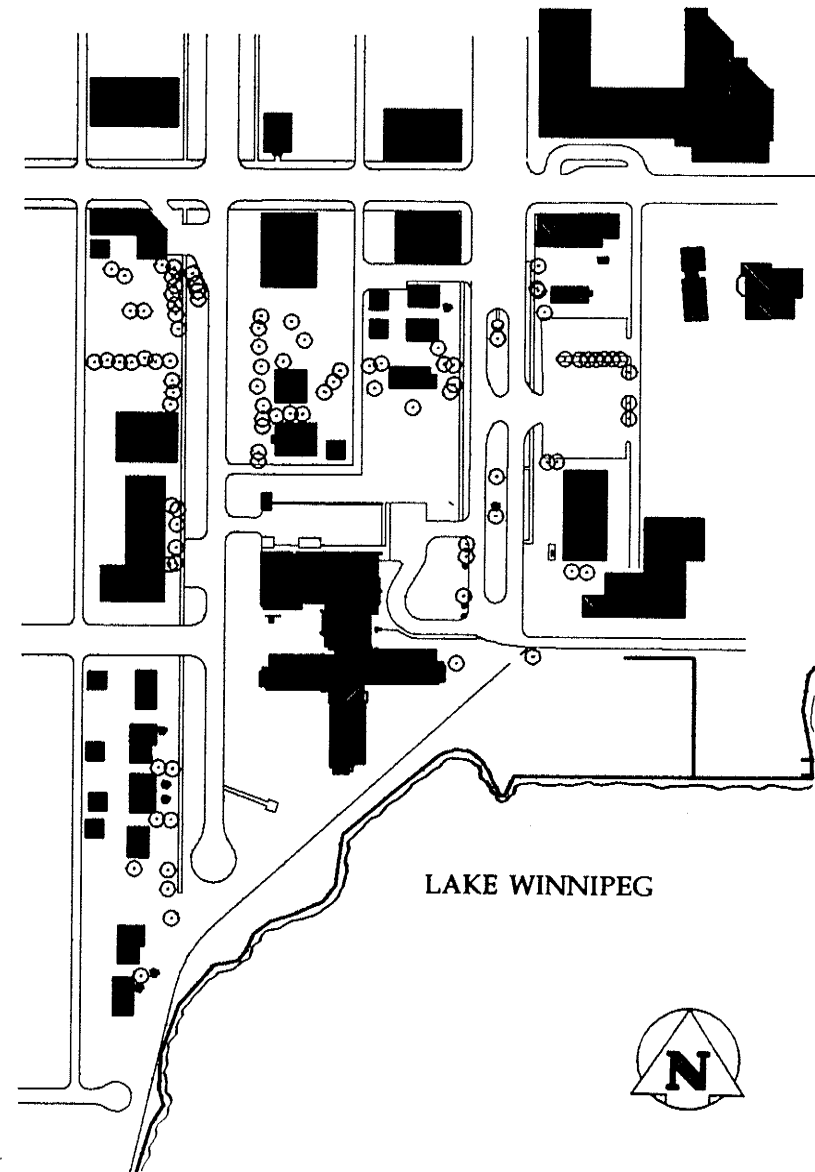
Figure 7   Figure Ground Relationship

N
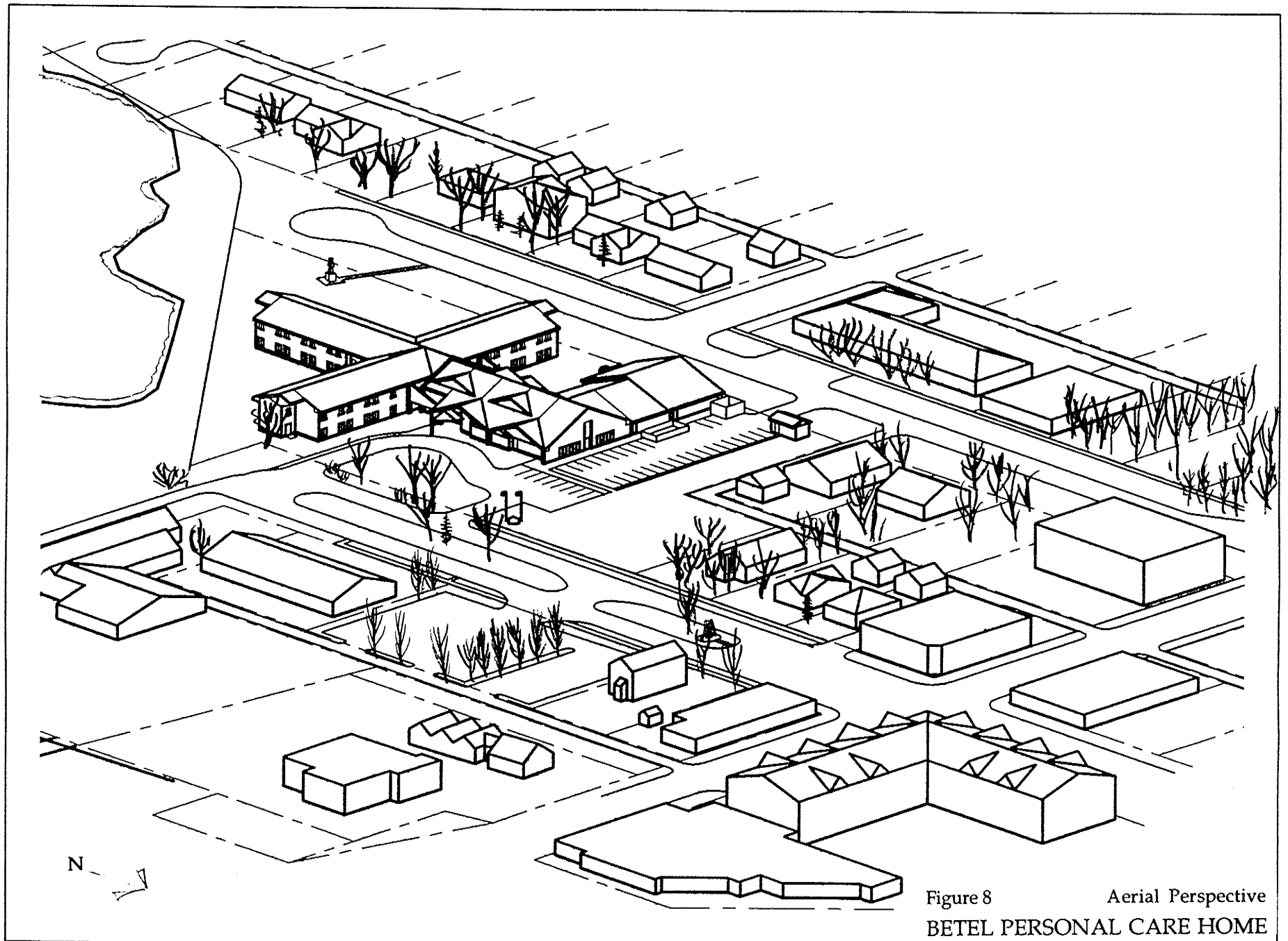
Figure 8   Aerial Perspective
BETEL PERSONAL CARE HOME

been identified on the Site Conditions/Photo Key Plan which corresponds to the following photographs of the site (*refer to figures 9 through 14*).

The undeveloped land to the north of the visitor parking and entrance area appears to be unassociated with the Home although it is part of the Betel property. The intent for this piece of land is for future development by the Home if and when more property surrounding it becomes available. It is hoped at that time a senior's apartment will be developed in association with the Home.

Figure 9.   Photo 1: Northeast/EntranceView

Figure 10.   Photo 2: Southeast

FUTURE
PARKING
LOT

0 10 20 30 40 50 m

LEGEND
—·—·— PROPERTY LINE
◄ MAJOR ACCESS
‹ MINOR ACCESS
✧ FIRE HYDRANT
o—●—o LIGHT STANDARD
③ PHOTO LOCATION

LAKE
WINNIPEG

1ST   AVENUE

VISITOR
PARKING

ENTRANCE

STONE WALL
(BREAKWATER)

STAFF PARKING

N

2ND   AVENUE

PUBLIC
STATUE

1ST STREET SOUTH

Figure 11.   Site Conditions/Photo Key
BETEL PERSONAL CARE HOME

25
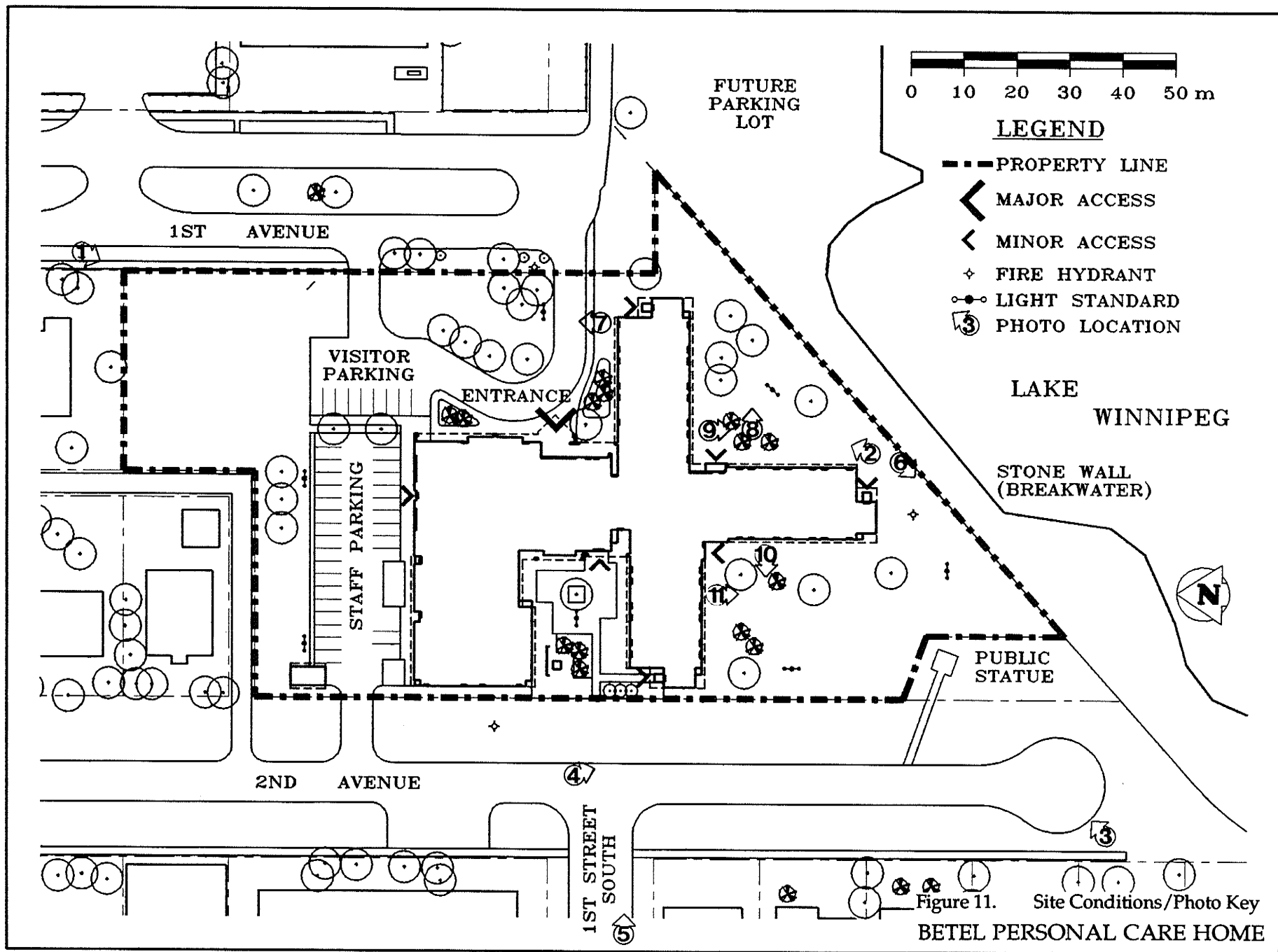
Figure 12.   Photo 3: Southwest

Figure 14.   Photo 5 : West - Courtyard

Figure 13.   Photo 4 : Monument

The terrain of the site is generally flat. The only noticeable drop in elevation is found at the lakeshore where a breakwater was erected in the early 1930's The breakwater is constructed of concrete and indigenous stone material, and measures 1.0 to 1.5 meters in height (refer to figure 15).

Figure 15.

Photo 6 : Breakwater

The Building

The building is situated on the largest portion of the site along the waters edge. The building has a main entrance core with radial arms extending north, south, east and west. The north arm has an extension to the west, consisting of a service wing. The south, east and west wings accommodate the residential rooms (*refer to figure 16*). These residential wings are two storeys in height, while the rest of the home is made up of one storey.

The first floor of the residential wings house the residents who are in fairly good health and require little care from the staff. These residents come and go as they please. The second floor consists of residents who require constant supervision, many of whom stay in their rooms for large parts of the day.

Access

The access points are shown on the Building Layout plan (*refer to figure 16*). The main entrance and exit point of the Home is located on the northeast side of the building. Secondary access points are from the west side (the courtyard) and the southwest side, both off common areas of the Home. Tertiary access points (fire exit doors) are found at the end of each of the residential wings as well as one in the south east corner, exiting the building on the second floor.

Figure 16. Building Layout
BETEL PERSONAL CARE HOME

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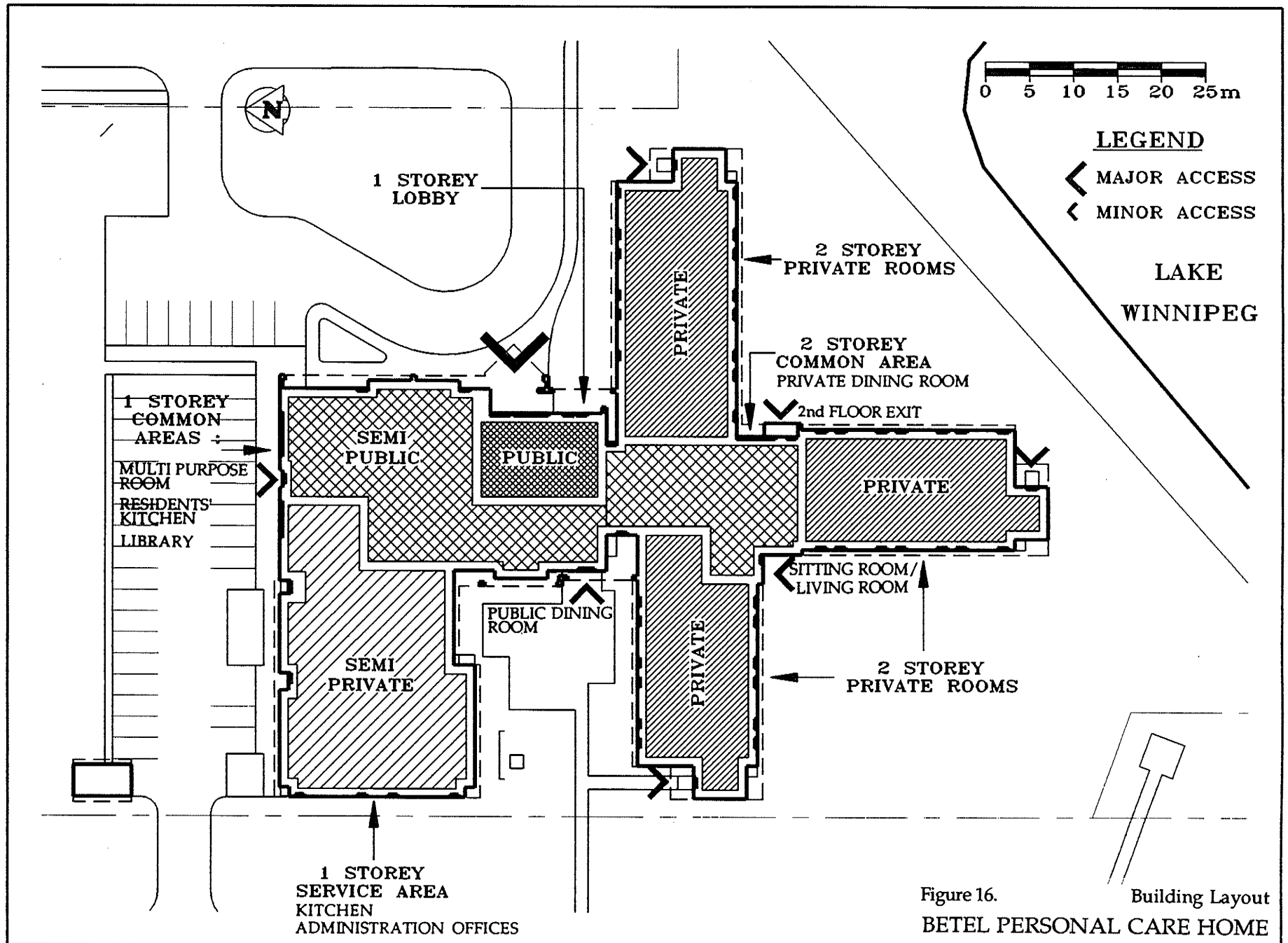
Views

The best views are to the south looking towards the lake. To the north and west, the views are of the residential housing typical of the neighborhood. The views to the east are predominantly the commercial/recreational sector of the community with the boat storage area of the Yacht Club (*refer to figures 17 through 21*).

Figure 17.

Photo 7 : View North

Figure 18.
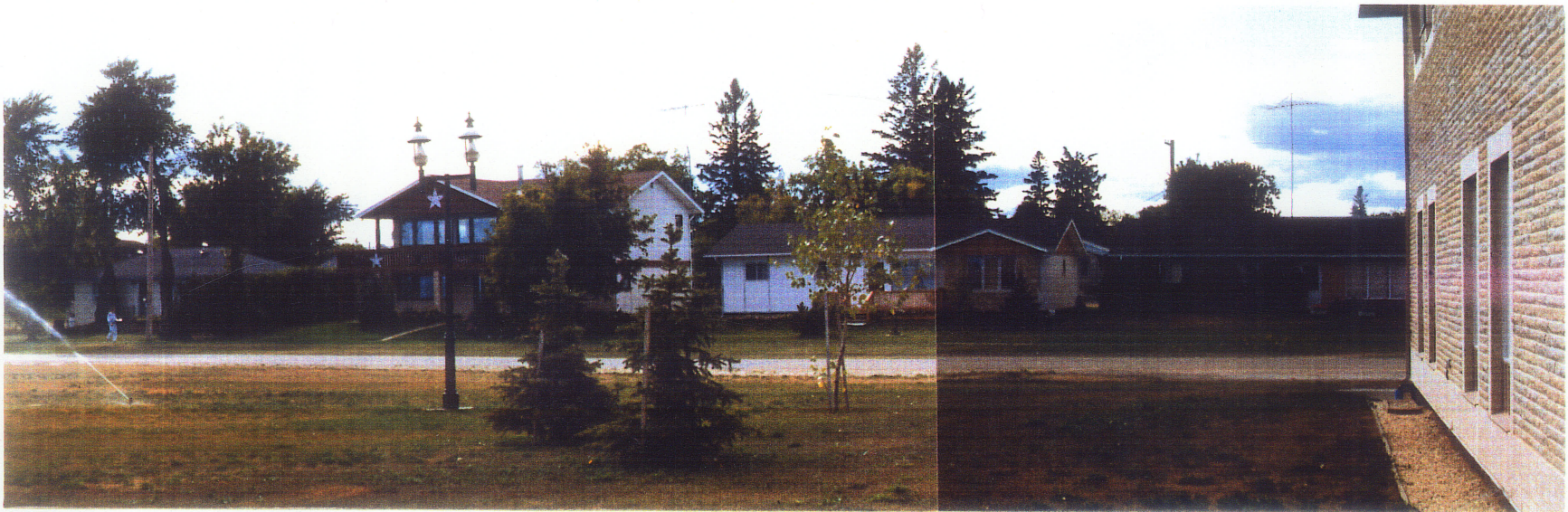
Photo 8 : View East

Figure 19.

Photo 9 : View South

Figure 20.

Photo 10 : View West

Figure 21.

Photo 11 : View South

Solar Analysis

By analyzing the suns path we can determine the shade patterns of the building on the site for any time or day of the year.[12] On June 21st (the summer solstice - typically the longest day of the year) we can see from shade patterns of the building how little relief from the sun the building affords the surrounding spaces (*refer to figure* 22). Areas within the courtyard and entrance space are in constant shade from the building, giving much needed relief from the summer sun but not enough sun for use in early spring and late fall (*refer to figure* 23). On the south sides of the residential wings of the building, residents must search out the shade.

In the winter, the low solar angle creates reflection off the frozen, snow covered lake and a great deal of glare in the southerly exposed spaces. These areas are unappealing in the winter due to this glare and lack of visual contrast.

Wind Analysis

The severity and direction of the wind is an important consideration when designing any outdoor space. Analysis of the velocity and direction of winds for the area of Gimli[13] (both yearly average as well as average of the summer months from May to September) indicates a higher percentage of winds from the west, south and northwest, respectively, occur during the summer months. The northwest winds are diverted by existing buildings and vegetation but there is a need for wind protection for outdoor seating areas for winds from the west and south. Site investigation also seems to indicate a need for protection from winds blowing off of Lake Winnipeg from the southeast.

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[12] Refer to Appendix B for determining the suns path and shadow patterns.

[13] Refer to Appendix C for 'Wind Roses' showing wind direction and velocity.

6:00pm

6:00pm

3:00pm

3:00pm

12:00pm

12:00pm

9:00am

0 5 10 15 20 25m

SHADOWS ON JUNE
21st AT 9:00am,
12:00pm, 3:00pm
AND 6:00pm.

AREAS OF DEEPEST
SHADING INDICATE
AREAS IN SHADOW
FOR A GREATER
PORTION OF THE
DAY.

Figure 22.   Solar Analysis on June 21st

BETEL PERSONAL CARE HOME

6:00pm

3:00pm

12:00pm

6:00pm

3:00pm

0 5 10 15 20 25m
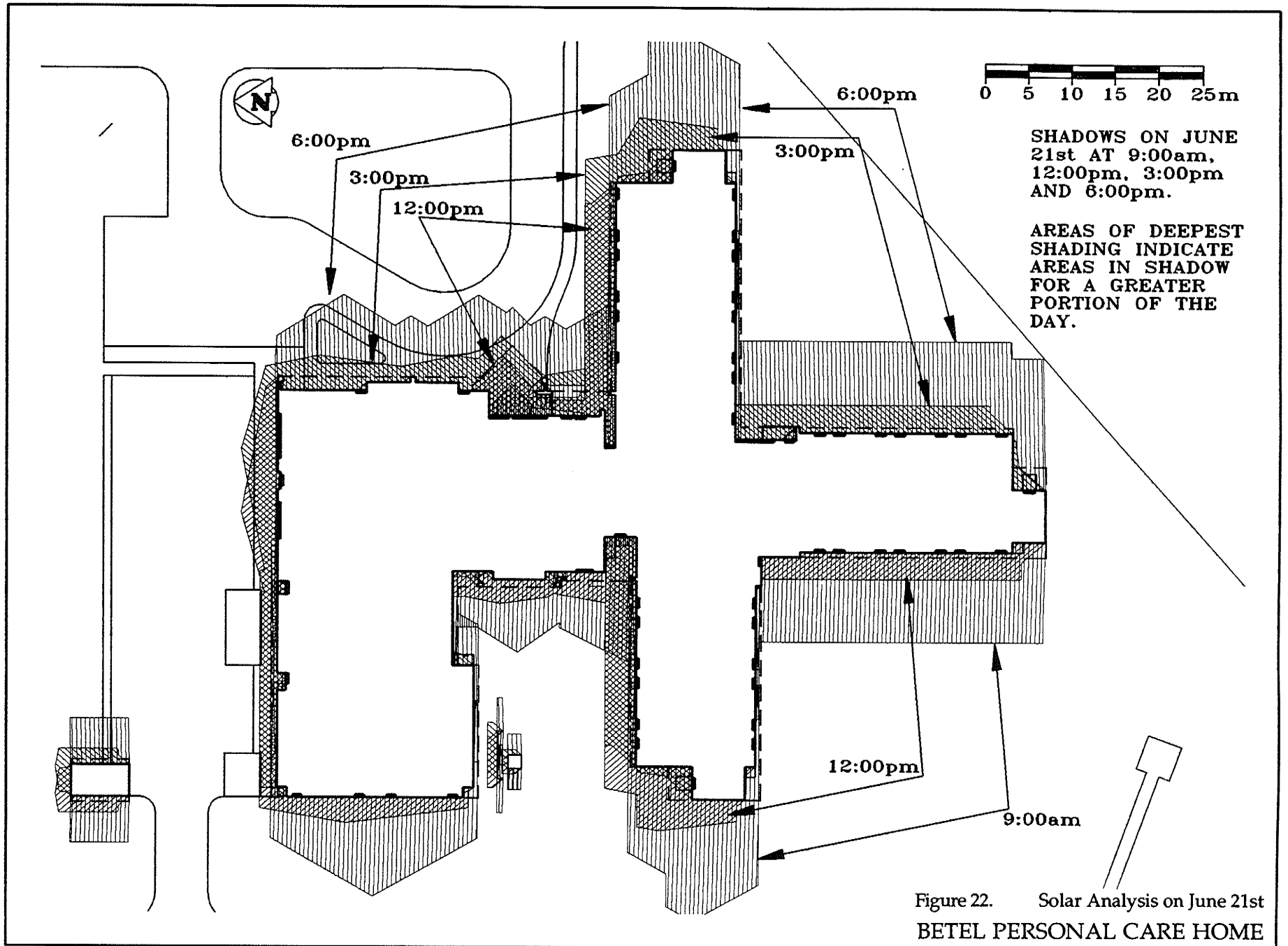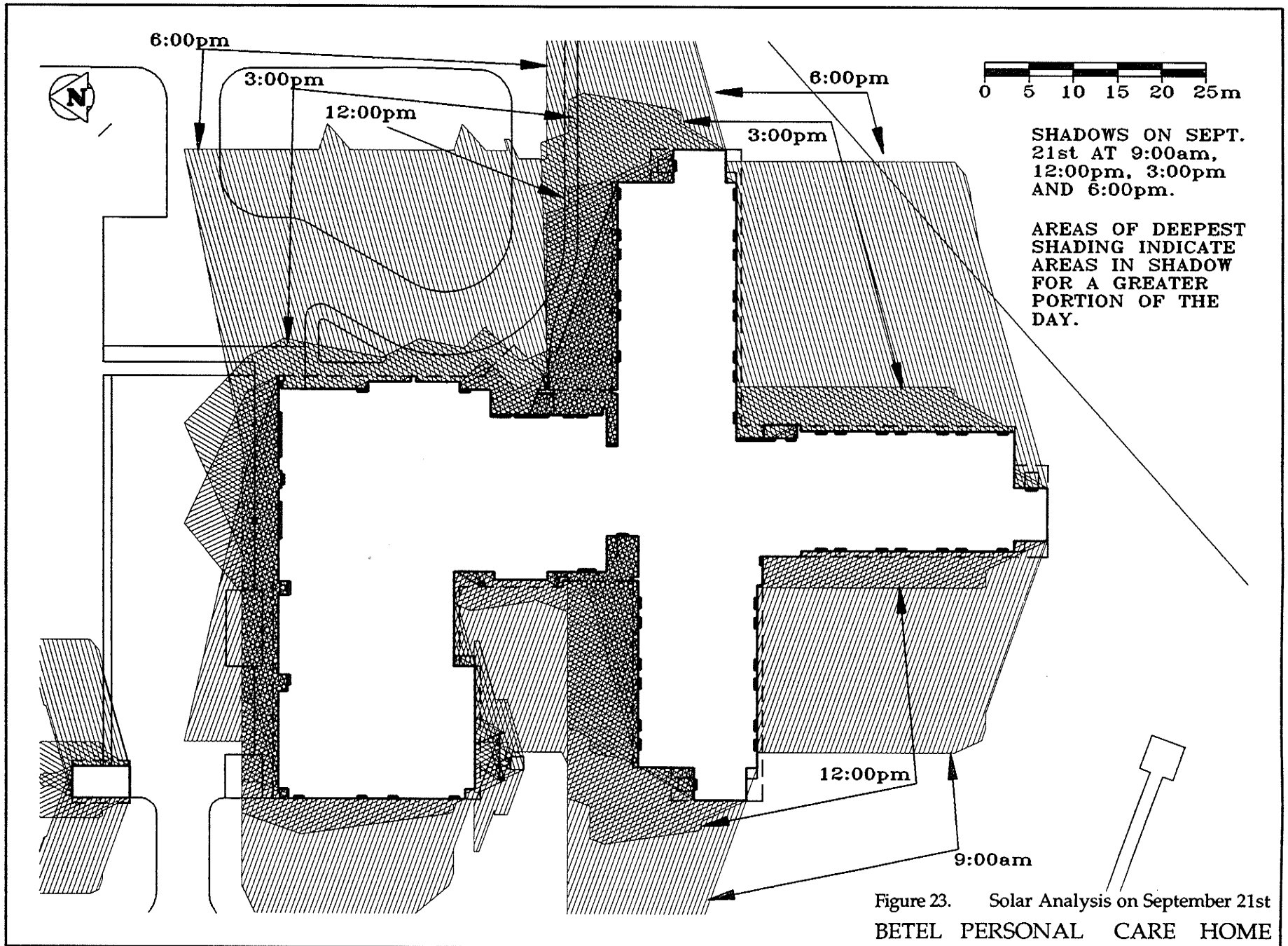
12:00pm

9:00am

Figure 23.   Solar Analysis on September 21st

BETEL PERSONAL CARE HOME

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Conceptual Development

Studies have found that physical health often declines rapidly upon entering institutional settings such as personal care homes, often in conjunction or as a result of mental health decline (Kahana and Coe, 1969; Lieberman, 1987). The conceptual basis for the design proposal grew out of the belief that the enhancement of the exterior surroundings of the Betel Home would bring about improvement in the quality of life of the residents and therefore improvement in function, self-worth, stability and behavior. By enhancing sensory stimulation and adding variety to the environment through careful design, improvements in physical and mental health can occur.

The two main concepts for the proposed design of the exterior environment of the Betel Home are to bring nature closer to the residents who are limited to their immediate environment, and to provide greater sensory enhancement and diversity through nature in the man made setting of a garden. The environment, besides being made beautiful, needs to be accessible to all residents irrespective of visual or ambulatory impairment. The smell of flowers, the sounds of water and birds, the roughness of bark, and other combinations of touch, smell, sight, sound and taste need to be within reach of all the residents to add richness, diversity, choice, challenge and independence to their lives.

> ... each site has its own special qualities of stone and earth and water, of leaf and blossom, of architectural context, of sun and shade, and of sounds and scents and breezes. Seek these out, and you will discover promises of formal order or artful naturalism--the beginnings of your garden.[14]

The garden design, based on site analysis, goals and objectives, programing and background research, is a synthesis of functional zoning, patterning, accessibility and safety concerns, environmental constraints, sensory enhancement and user participation in design. The following is a more detailed look at these categories.

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[14] Moore, Charles W., Mitchell, William J. and Turnbull, William, Jr. The Poetics of Gardens. Cambridge, Mass: The MIT Press, 1988, p. 1.

Functional Zoning

The proposed design deals with three areas with little or no development within the site. Improvements to the existing entrance, drop-off and courtyard areas have been suggested. The site, already zoned into areas by the built form and layout of the building, lent itself well to varied garden settings and qualities of space. Zoning of the three areas is based on:

1. Programming (refer to Programme, p. 15).

2. Functional zoning of the interior of the building (refer to figure 16).

3. Access points from the building and site (refer to figure 24).

4. Circulation patterns.

The three areas shown in figure 24, the Zoning & Programme Summary have each been given a name expressive of their function as follows:

1. A Sensory Garden - a private garden for the residents of the Home.

2. The Social Garden - a social gathering place for the Home and visitors (family and friends).

3. The Public Garden - a public meeting place for the community and the Home.

1ST AVENUE

ZONE 3: PUBLIC GARDEN
- small to medium groups
- visiting, entertainment, watching parade
- stage, play area, seating, viewing area for parade
- residents, community, visitors
- open-'pocket park'

connection to Lake/Terminus →

EXISTING ENTRANCE
- new planting configuration

ZONE 2: SOCIAL GARDEN
- enclosed
- medium to large groups
- barbeque's, visiting, viewing, entertainment
- patio, shady areas, protection from wind, maintain views of Lake, buffer views of future parking lot
- residents, visitors, staff

LAKE WINNIPEG

BETEL CARE HOME

ZONE 1: SENSORY GARDEN
- enclosed
- small to medium groups
- passive recreation
- seating areas for varying size groups, shady areas, protection from wind, maintain views of Viking Statue
- residents, visitors

EXISTING COURTYARD
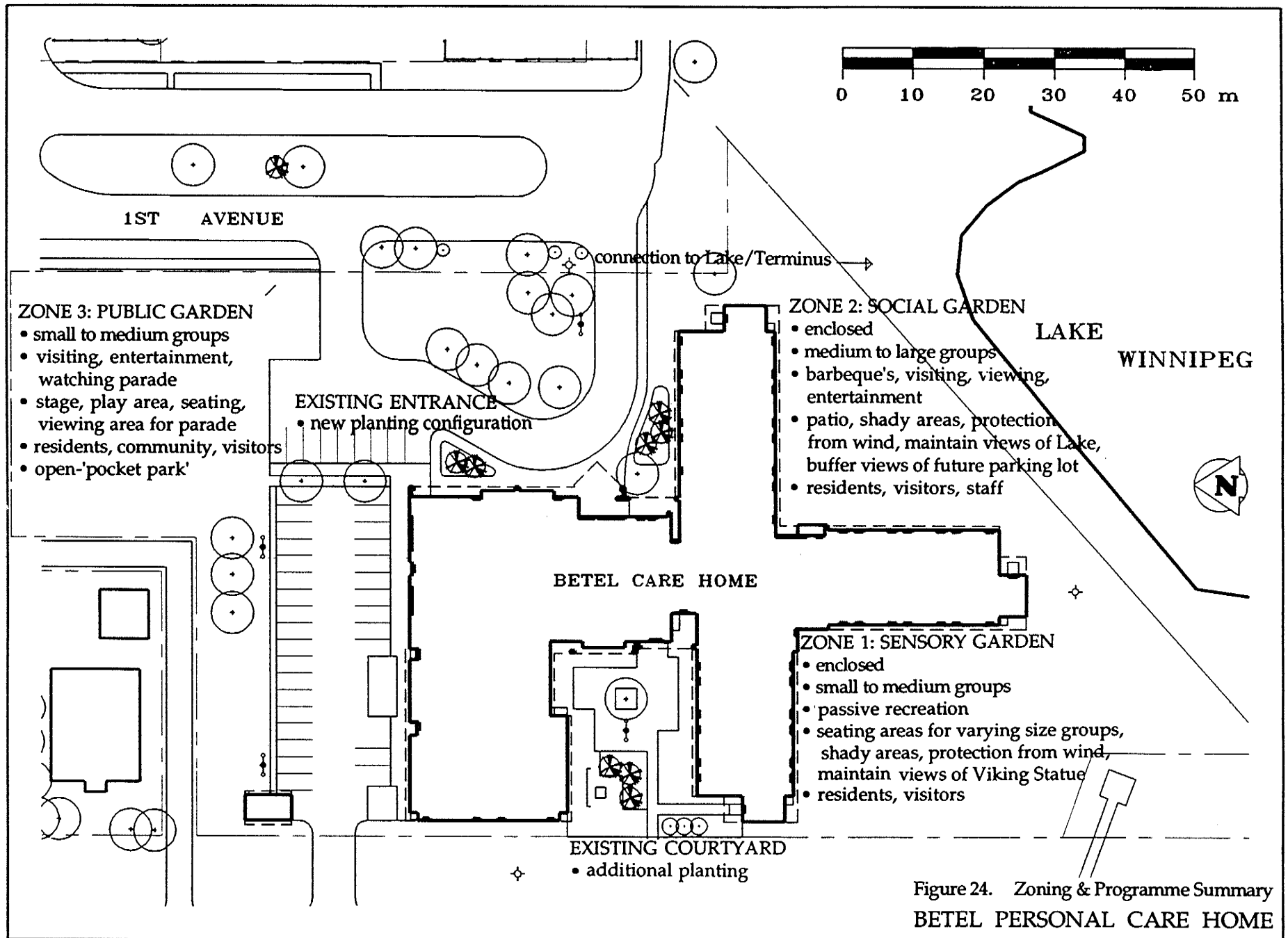- additional planting

Figure 24.   Zoning & Programme Summary
BETEL PERSONAL CARE HOME

Patterning

Elements within and surrounding the site were used as geometric determinants for the site patterning. The primary ordering factors were:

1. the Home,

2. the street grid

3. the Breakwater and

4. the circulation patterns.

A second ordering factor for part of the Sensory Garden was the orientation of the Viking monument in the southwest portion of that zone.

The thematic basis for the layout of the patio and planting beds was based on traditional styles from Icelandic wood and stone carving and linen lacing. An example of the Scandinavian knotwork woodcarving used to develop the design for the planting beds is shown in figure 25.
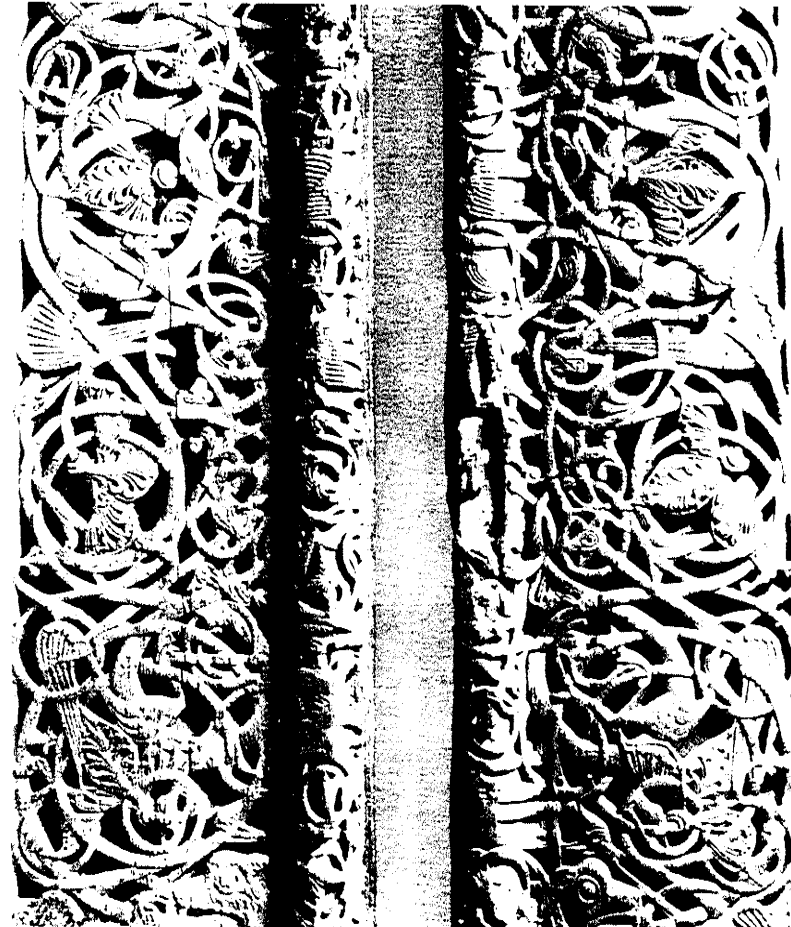

Figure 25.   Scandinavian Knotwork

source: Native Art of Norway, p. 23

The design for the patio layout was based on samples of patterns from traditional tapestries and linen lace work. An example of traditional tapestry work is found in figure 26. A sketch of the linen lace work (found in the Gimli Museum) is shown in figure 27.
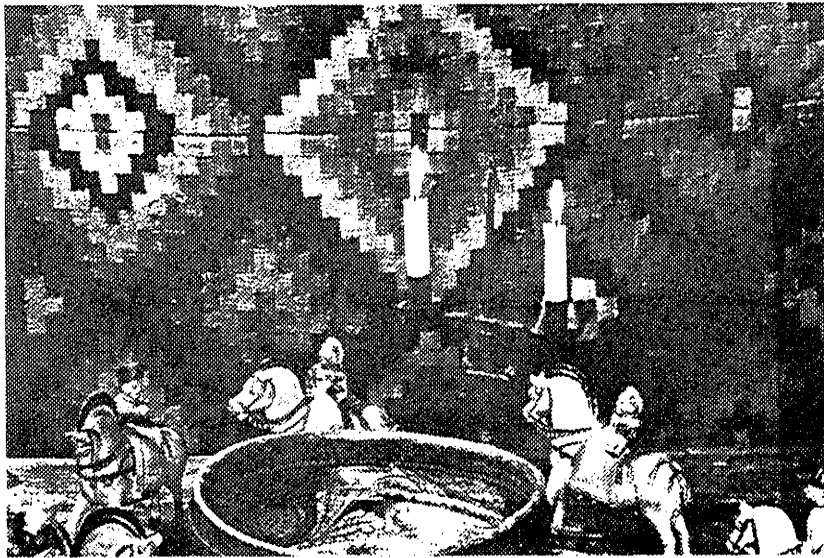
38

Figure 26.   Scandinavian Tapestry

source: Native Art of Norway, p. 62
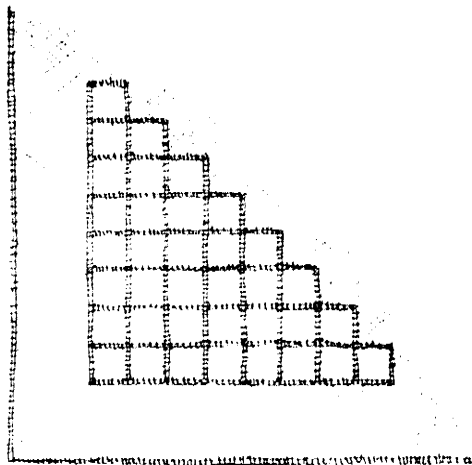
Figure 27.   Icelandic Linen Lace Work

Accessibility and Safety

Accessibility

Typical dimensioning of design features must be modified to accommodate the impairments of the residents of the Betel Home. Considerations such as:

1. Open ended benches are difficult to negotiate for the elderly. Benches with arms and individual chairs should be used for seating areas. Chairs have the added benefit of being manipulated in the environment to accommodate choice in position and to accommodate people in wheelchairs.

2. Tables and chairs are recommended instead of picnic tables with attached benches. Tables are easier to negotiate then picnic tables and again can accommodate wheelchairs with little difficulty.

3. Many of the planters are to be raised to accommodate the residents who cannot bend over or are confined to wheelchairs. Raised planters allow the residents to smell and touch the plant material and to partake in gardening activities if desired.

4. Railings are to be placed along pathways to accommodate and encourage participation in the

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environment by those who require some type of mechanical aid.

5. Pathways are to be constructed of a hard surfaced materials and relatively smooth in texture to assist mobility for wheelchairs and walking aids users.

Safety
As well, safety considerations must be addressed through dimensioning, layout and materials selection.

1. Pathways are to be slip resistant and have contrasting bands along edges for greater visibility.

2. Areas are to be fairly open so residents can see there is no potential danger and so staff can keep an eye on the residents.

3. A part of the site is to be secured by fencing and hedging so residents cannot 'wander' off but they can come and go as they please between the Home and these areas. This helps in promoting independence for the people who need supervision. Hedging is not to be higher than 900mm and fencing is not to be solid so residents are able to view out into the community and do not feel confined.

4. Clearly organized pathway systems and views of access points are not to be hidden.

5. Artificial lighting is to be provided for night time use of gardens. Paths and entrance points are to be well lit with a greater distribution of fixtures then would normally be used to benefit those with limited vision. Lights should be placed above (2000mm) or below eye level (900mm) as well, direct and indirect glare must be avoided.

Environmental Constraints

The microclimate of a site will determine if and how an outdoor space will be used. If the area is constantly in the sun, the space will not be used by anyone during the hot days of summer. An area constantly bombarded by high winds will also discourage people from using the space. Fortunately, microclimates are easily manipulated by plant material and structures to catch breezes and block or catch the sun's rays.

1. Solar Constraints

Regulating ones body temperature becomes a problem as people age: cooling down when it is very hot or warming up when it is cold is more difficult for the elderly because of generally decreased metabolism, thinner skin and thinner body fat layers. Comfort becomes an important issue when using an exterior environment, however the microclimate around the Home can easily be modified with the use of shade devices such as canopy trees, umbrellas, gazebos and trellis'.

The heat from the sun can be positive or detrimental to the elderly, depending upon the season. The length of time over the season that an exterior environment may be used can be extended by 'catching' the suns rays. By capturing the sun in certain areas during the spring and fall, these areas can be warmed enough to be used during the day. As noted previously, the areas could even be used during pleasant days of winter. During the heat of the summer day, protection from the sun becomes crucial if the residents are to use the exterior landscape. Glare caused by light reflecting off the lake surface is a problem during the summer.

Glare can also be a problem during winter with the vast amount of snow covering the nearby lake and the low solar angle. Deciduous and coniferous trees can reduce glare by filtering the light and creating shadowed areas. Trees and shrubs planted along south facing walls will help reduce glare on snow and windows. The use of deciduous trees would allow sunlight through during the winter months, and areas of the gardens could be used for strolling and sitting on the more pleasant days of winter.

The solar analysis shown in figures 22 and 23 can be used to determine the location of shade devices in the landscape.

2. Wind Constraints

An area as close to the lake as the Betel Home will be affected by the heating and cooling effects of the body of water; typically on calm days there will be afternoon breezes off of the lake and a night breeze off of the land. Trees and plant material can help to reduce wind velocities (by up to 50%), by dampening and diverting winds and creating breezes (Lynch, Hack, 1984). A cooler, more humid and stable microclimate results.

The wind analysis described in Appendix C, Wind Analysis, can be used to determine the location of wind barriers in the landscape.

Sensory Enhancement

One of the underlying ideas behind the design is to stimulate all the senses: sight, smell, hearing, touch and taste. Sensory enhancement can be achieved through various elements in an exterior environment through stimulation of individual senses one at time or in combination. A view from a window will stimulate sight; open the window and the scent and sound of the outdoors adds to the perception of the view.

1. Visual Enhancement

Sight is considered to be the most important sense. The design must be enhanced to compensate for the effects of failing eyesight through the use of colour, contrast and the framing of views to help pick out focal points in the environment.

Colour can be used in the following ways:

  a) Brightly colored objects and plant material can be placed to catch the eye. Reds, yellows and oranges can be seen more clearly by the elderly than blues and greens and should be considered when placing objects in the landscape.

b) A mass of shrubs in muted colours could be used as a backdrop for a bright coloured object; the soft green of trees pruned to frame a view, a massing of brightly coloured flowers to draw a persons eye.

c) Plant material has the added value of adding seasonal colours for visual enhancement and diversity throughout the year. Shrubs and trees can be planted for the colour of their bark during the drab winter months. Blooming characteristics of annuals, perennials, shrubs and trees vary so one can create a garden which blooms from early spring to late fall.

d) It is believed that combinations of colour can be used to elevate or modify moods.

> In the main, the colors of the spectrum are to be associated with two moods, the warm, active, and exciting qualities of red and its analogous hues, and the cool, passive, and calming qualities of blue, violet, and green. Areas of these hues tend to enliven the mood or to quiet it. Likewise light colors are active, while deep colors are likely to be passive. Beyond the feeling of warmth or coolness, brightness or dimness, the exact choice of a hue or tone is fairly optional matter, and its power to arouse pleasure or displeasure may depend on individual predilections.[15]

Specific colours can then be used to create certain moods in the environment. A meditative area could be planted with blue and green plant material in a shady location for a calming affect.

Suggested plants for a colourful garden for all seasons are numerous and include annuals, perennials, herbs, vegetables and shrubs. A listing of plants having bright flowers or colourful bark and foliage can be found in Appendix D, Plant Material.

2. Olfactory Enhancement

Smell is also a very important sense and the environment can easily be enhanced through the use of plant material. Plant material has a vast array of wonderful scents.

Flowers are obvious scent producers. Scent is also given off by the foliage of plants; if brushed up against

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[15] Birren, Faber. Color Psychology and Color Therapy. Secaucus, N. J.: The Citadel Press, 1961, p. 141.

or broken they will emit tantalizing scents.[16] Smells can also come from stems, roots, bark, seeds, plant resins and from the surrounding earth.

Scent producing plants and flowers can be placed either separately, to allow individual smells to be found alone, tucked away so people come across them unexpectedly, or in groupings to combine into a strong new smell.

Plants and flowers can be located under windows so the residents can smell the garden without leaving their rooms. As well, sachets and potpourris could be made from flower petals and foliage and placed inside the Home to extend the season of olfactory experience.

There is a definite art to mixing scents and care must be taken to avoid the combination of a strong scented plant (such as a Marigold) with a delicately scented plant (such as a Columbine). Hybridization of flowering plants seems to have eliminated the scent from many plant species (notably Sweet Peas) and older varieties of certain plants may be preferable from an olfactory perspective.

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[16] Smell can be used to evoke memories and give people a certain feeling; for example, the smell of a pine tree may evoke memories of Christmas time.

Suggested plant material for a scented garden can be found in Appendix D, Plant Material.

3. Auditory Enhancement

Hearing is an important sense which is not easily enhanced by the environment. Sounds can come from such things as the rustling of tree leaves in the breeze (Birch, *Betula species*, Aspen, *Populous species*), running water and songbirds. Sounds can also be created by man-made objects such as wind chimes.

Sounds need to be increased to enhance the auditory experience for people with hearing problems. To increase sounds in nature, large numbers of objects, such as songbirds, are required but this may not easily be accomplished or desired (especially amongst people with no hearing impairments).

Hearing impaired individuals that wear hearing aids (for more severe hearing problems) have the problem of not being able to shut out background noise, commonly known as white noise. White noise can become very irritating to such individuals and can be mitigated by reducing the actual sound level. For example, wind

barriers can be placed to reduce the wind and associated wind noise.

Noise from outside sources such as the future parking lot to the southeast of the Betel Home should be reduced by shrub and tree planting, or by the installation of noise barrier walls if noise were to become a serious complaint among the residents. However, care must be taken not to completely filter out the noise entering the Betel Home property from outside or the Home would become a silent island, detached from the surrounding community. Noises such as the sound of children playing or the sounds of Lake Winnipeg are especially dear to many of the residents and the design should enhance these sounds.

4. Tactile Enhancement

Touch is a sense that is easily enhanced in the environment to create varied and interesting tactile contact experiences. Soft landscaping (trees, shrubs, perennials, annuals, grasses) and hard landscaping (paving, walls, fencing, railings, site furnishings) can be combined to create a diverse environment of smooth, rough, hard, soft and wooly textures.

Hard landscaping for varying tactile experiences would include:
   a) raised planters constructed of limestone,
   b) varying textures of pathways; concrete, paving stone and wood
   c) various materials for site furnishings; plastic, wood, metal,
   d) clay and plastic pots

Plant material for interesting textures to be used in the soft landscaping of the gardens are listed in Appendix D, Plant Material.

5. Taste Enhancement

Taste experience can be varied within a garden setting; Edible fruit, herbs and vegetables can be planted for taste experience, but such food should be prepared in the kitchens of the Home. Picking and tasting of plants within the garden should not be encouraged among the residents since many are on controlled or monitored diets. In addition, while no toxic plants should be planted in the landscape, many plants are not healthy if eaten. Raised vegetable gardens already exist in the courtyard so the use of vegetables in the proposed gardens has not been considered.

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Wildlife in the Garden

Wildlife in the garden can provide both visual and auditory interest for the residents. Bird feeders, houses and baths can be used to draw songbirds into the garden. A variety of plant species can be planted to provide food and cover for birds and small mammals, and nectar producing flowers can be used to attract hummingbirds and butterflies. A list of plant species attracted to wildlife is found in Appendix D, Plant Material.

User Participation in the Design

Choice and independence in the elderly's surroundings are important aspects that have been emphasized in numerous studies. Choice and independence can be achieved by allowing the user to participate in the design through selection and placement of numerous elements that can be moved, removed and added at any time within the gardens. These elements can be such objects as:

1. Artifacts from previous environments of home, work, school and community: boat anchors, wooden cart wheels, fish barrels, etc.

2. Site furnishings: chairs, tables, rocking chairs, swing sets, umbrellas.

3. Garden elements: concrete fixtures such as gnomes and animals, fountain elements, bird feeders and houses or any other such thing that the residents would like to see in the gardens.

4. Flower pots and types of flowers to put into the pots. Placement of such pots could be in sight of residents windows so they can view them at any

time. These could be planted and maintained by
the residents.

Areas for such elements have been created in the
proposed design as focal points within the gardens to
provide stimulus and points of interest for the users.

Description of Results

The following is a detailed description of the three gardens; the Sensory Garden, the Social Garden and the Public Garden. The proposed design for the exterior environment for the Betel Personal Care Home is found in figure 28.

Each of the gardens provide areas for different activities to occur within their boundaries. Different elements and spaces were created because of these different activities.

All gardens are meant to be viewed from the residents rooms which face onto them, especially during the winter months. Selection of plant material for winter contrast is very important for maximum visual appeal and interest.

A public boardwalk is located along the breakwater to encourage community use and interaction. The boardwalk provides outside activity adjacent to the gardens for resident observation and interaction at key points. The Sensory Garden and the Social Garden are enclosed within hedges and fences to prevent residents from wandering away and to delineate the private grounds of the Home from the surrounding right of ways and public spaces.

Remedial modifications to the existing entrance, drop-off and courtyard areas are proposed for these areas to maintain the unity of the overall landscape.
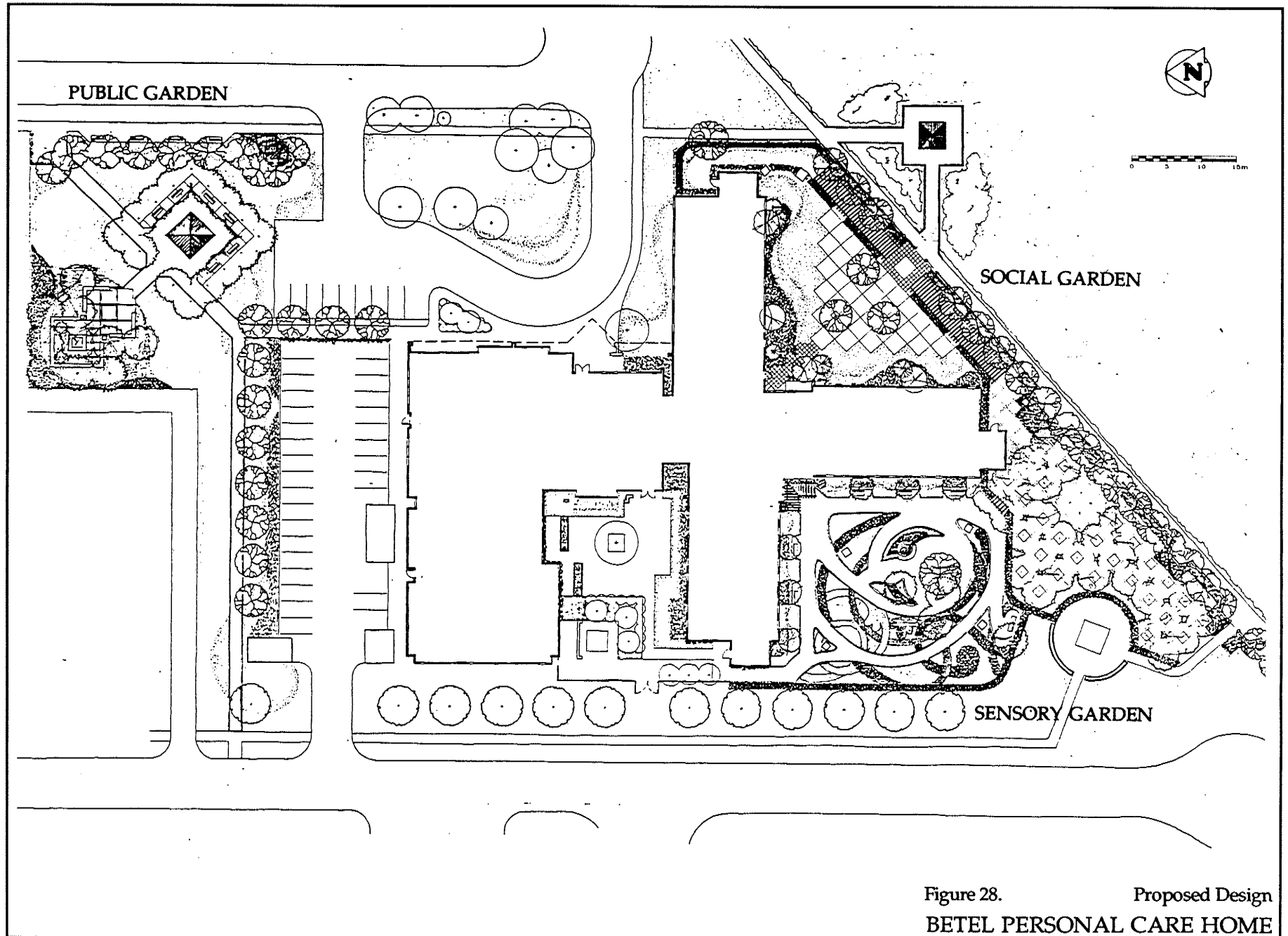
PUBLIC GARDEN

SOCIAL GARDEN

SENSORY GARDEN

Figure 28.   Proposed Design
BETEL PERSONAL CARE HOME

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A Sensory Garden

The Sensory Garden is intended to be a very interactive landscape and has been designed to enhance the sensory experience of the elderly residents. Numerous plants in raised planting beds (700mm height) allow residents to touch, smell and see from all vantage points within the Home, as they enter the garden and from within the garden itself. A bosque of trees to the south creates a shady cool space, visually contrasting to the bright, sunny enclosed garden. The patterning of swirls in the hedges, flowers, herbs and ground cover are based on traditional Scandinavian motifs and are designed mainly to be seen from the second storey windows. The intention is to have swirls of color which would change with the seasons (2 to 3 species planted together, which would bloom at different times). For example, one color of tulip would appear in the spring and then be taken over be a mid-spring blooming plant, which in turn would be followed in succession by a plant that blooms in summer. An array of green shrubs, hedging and trees would be the backdrop to these colorful swirls so as not to compete visually in the landscape.

A sitting area situated in the middle of the garden along with shade trees and a water feature provides a point of interest for a visual, auditory and tactile experience. Seating areas for individuals and small groups are located throughout the garden, a covered seating area is located adjacent to the doorway of the sitting room of the Home. A pathway runs around and through the central garden area. The peripheral pathway is located three meters away from the building wall with a raised planter of small trees, shrubs and flowers to create a privacy barrier for the residential rooms facing the garden.

The bosque of trees protects the main sensory garden from high winds from the south but helps to catch breezes off of the lake. This area is intended to be a cool, shady contemplative garden situated away from the home for residents to 'escape' from it all. It is also meant to be a very flexible space. The surfacing would be all paving except for the tree wells, which would make the whole space usable. Chairs, tables and game tables could be placed throughout the area for passive recreation. Classes or readings could be held in the open square.

Access

Seating

Raised Planting Beds

Path

Water Feature

Seating Area

Path

Artifact

Path

Street Tree

Arbor

Seating

Hedge

Gateway

Lake Winnipeg

1250mm Fence

Boardwalk

Seating Area

Bosque

Viking Statue

Seating

N

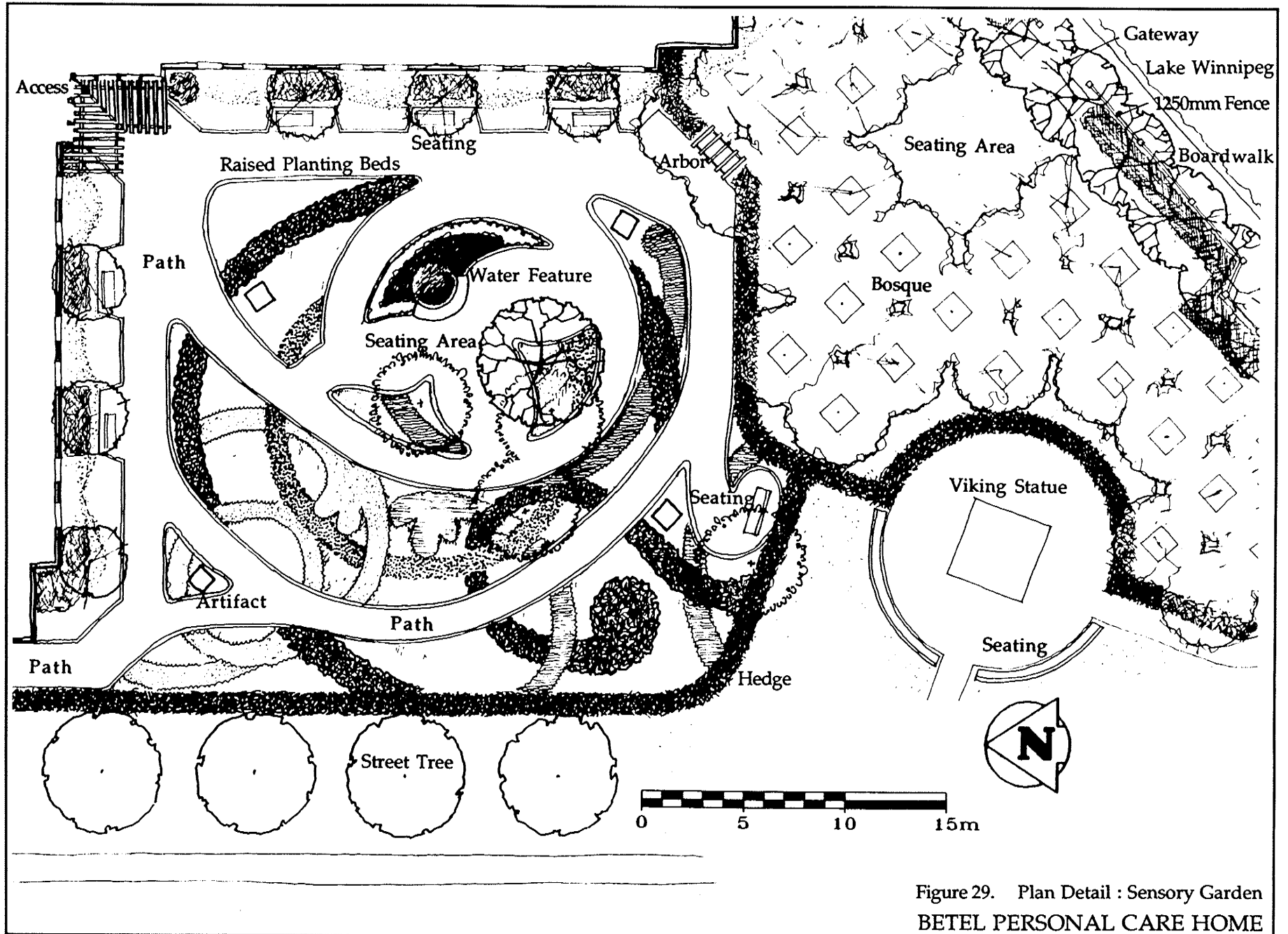0   5   10   15m

Figure 29.   Plan Detail : Sensory Garden
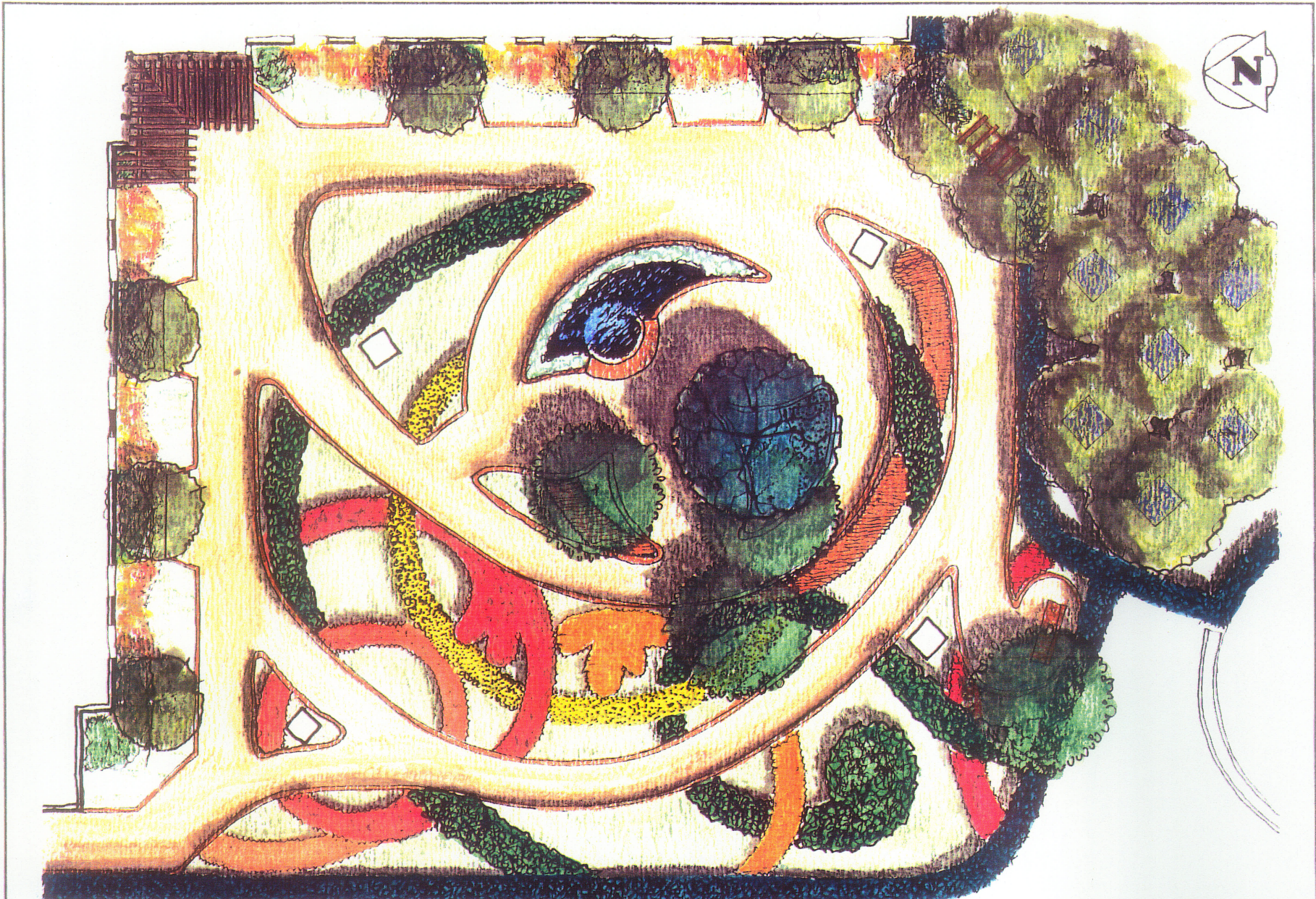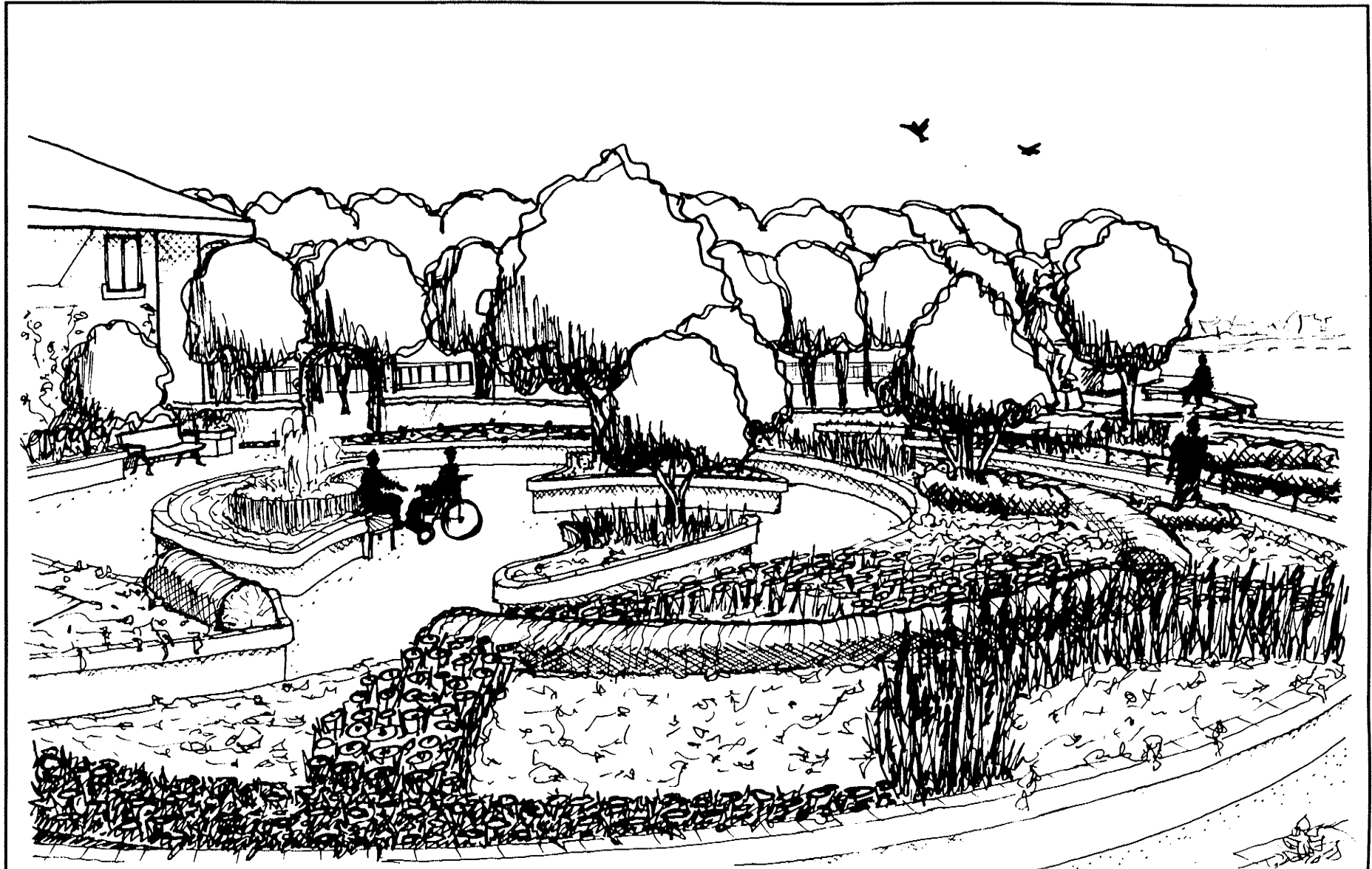BETEL PERSONAL CARE HOME

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Figure 30.   Colour Detail : Sensory Garden

BETEL   PERSONAL   CARE   HOME

View Looking South from 2nd Storey Window

Figure 31.   Perspective : Sensory Garden
BETEL PERSONAL CARE HOME

A Social Garden

The Social Garden is intended to be an informal gathering space to encourage social interaction among the residents and staff. The planting also adds to the informal quality of the space through the use of flowing planting beds and using primarily indigenous plant material along the walls of the building (again to create a privacy barrier for the residents rooms) and in the patio area. Native shrubs, trees, wildflowers and grasses would attract wildlife into the garden to provide visual and auditory enjoyment for the users of the space and the residents with rooms facing into the garden.

The main activity for the large patio area is as a barbequing area for the Home and would involve 60 or more people. Table and chairs can be placed informally on the patio area when such activities occur. Small and medium sized groups could also use the space for crafts, visiting, meetings and classes for disorientation. Located along the southeast edge of the site is a path with seating and an overhead trellis for sun protection. In addition the trellis and trees help frame the views out towards the lake.

A focal point is created beyond the garden with a pavilion/fishing pier. The pavilion becomes a terminus for the public sidewalk along 1st Street. The pavilion is also accessed from the boardwalk and is intended to encourage social interaction between the community and residents. The pavilion will act as a focal point to draw the eye away from the existing boat storage area and the future parking lot.

The space is intended to be added and changed over time by the residents. Additions of hanging flower pots for the trellis and standing flower pots for the patio are to be encouraged as well as the addition of bird houses and feeders like the ones currently on site. These types of elements and other artifacts can be added, removed and modified over time by the residents to make it feel like home.

Sidewalk

Walkway

Artifacts

Fence Hedge

Flower Beds

Pavilion/Viewing Area

Lake Winnipeg

Boardwalk

Patio

1250mm Fence

Trellis

Breakwater

Grassed Area

0   5   10   15m

N
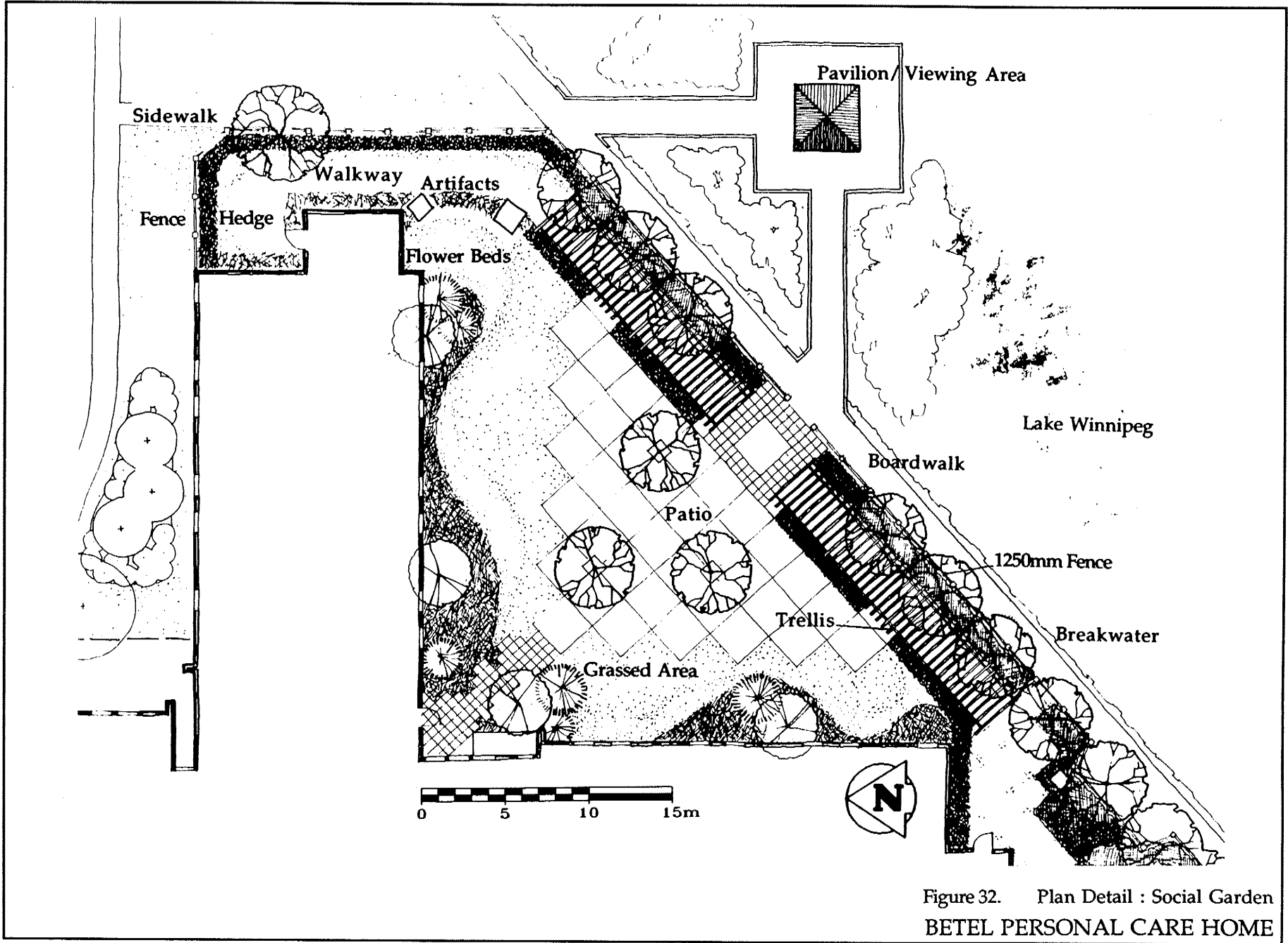
Figure 32.   Plan Detail : Social Garden

BETEL PERSONAL CARE HOME

Trellis

Pavilion

Fence

Boardwalk

Lake Winnipeg

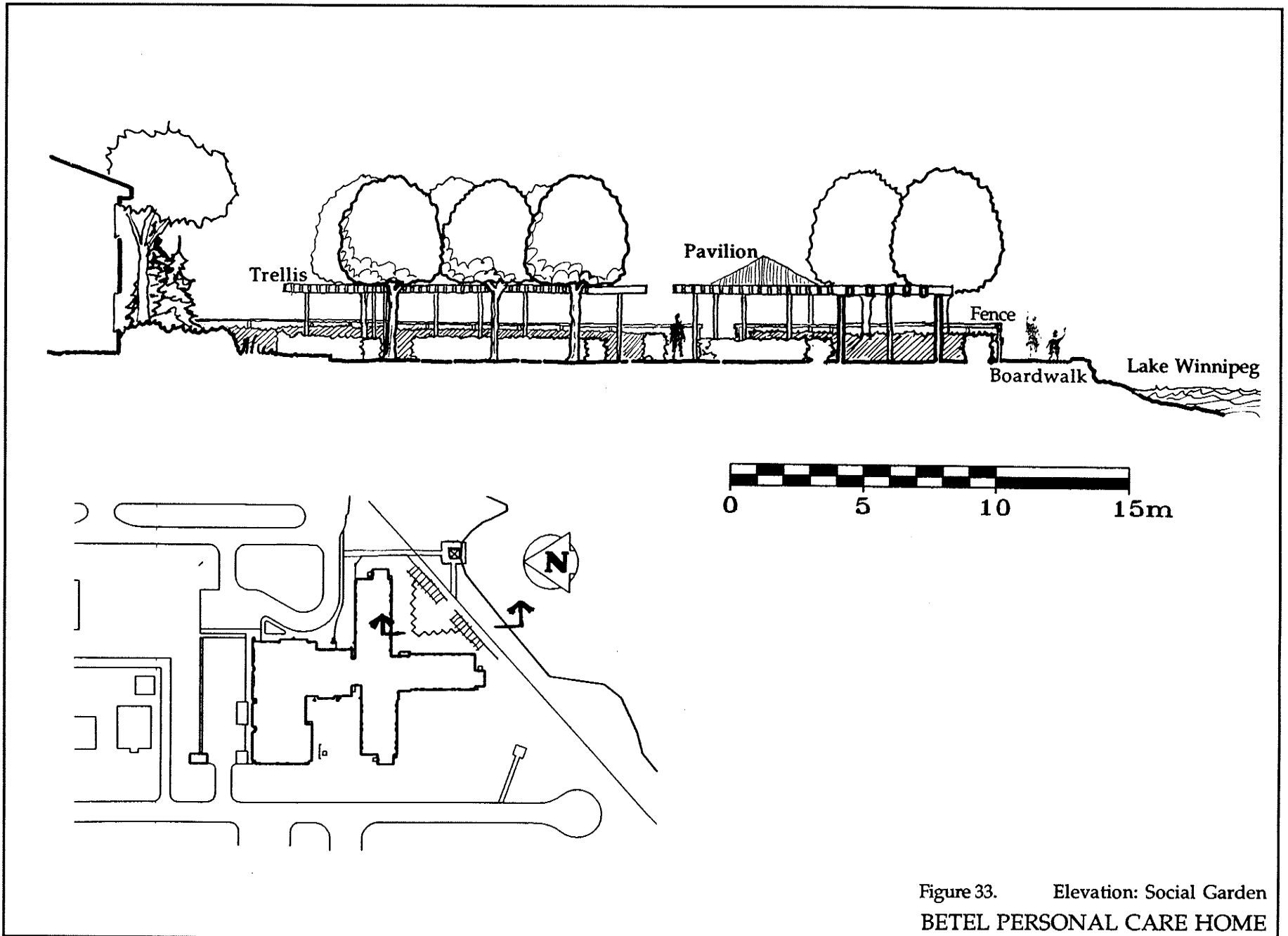0   5   10   15m

N

Figure 33.   Elevation: Social Garden
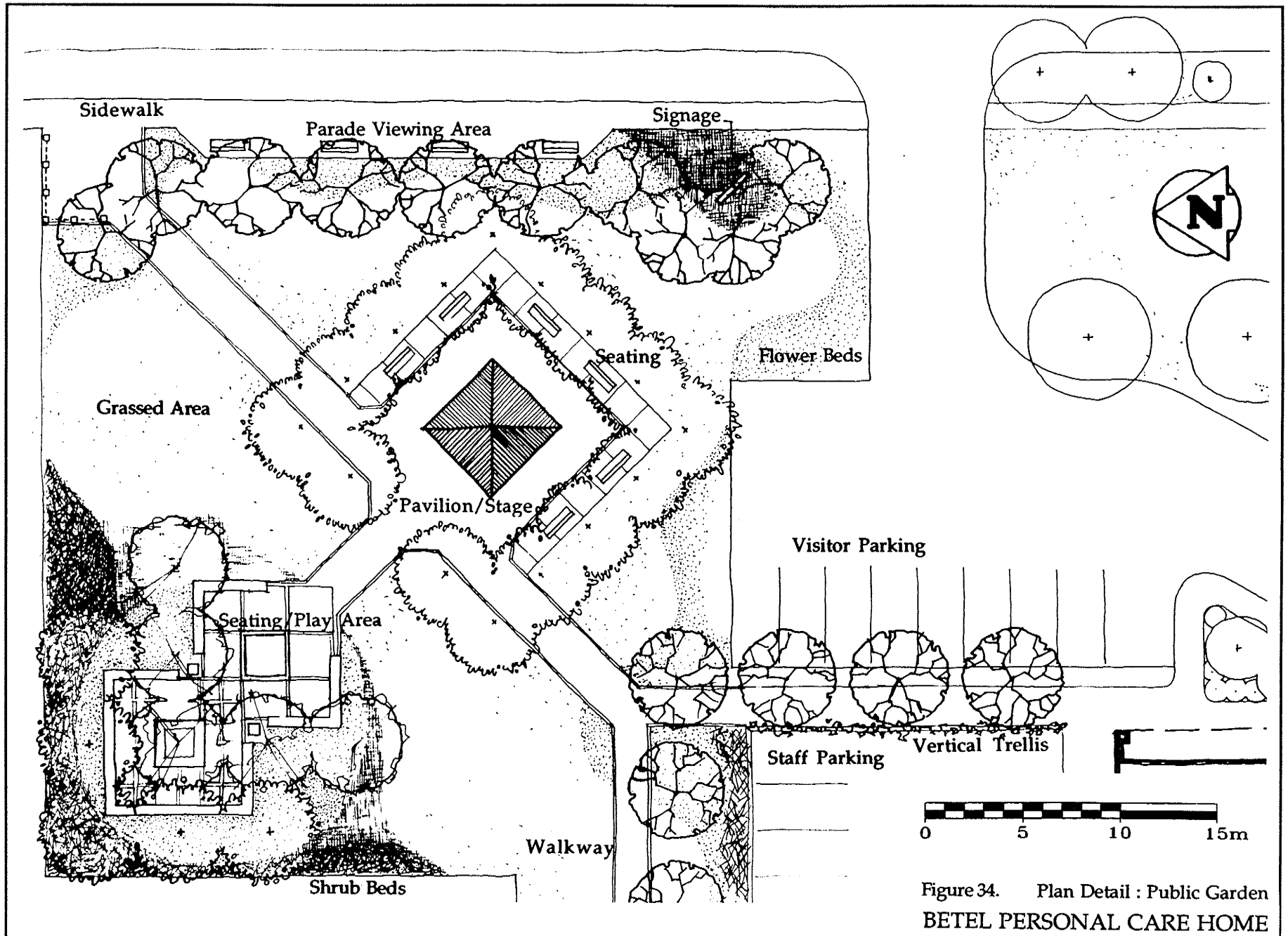BETEL PERSONAL CARE HOME

A Public Garden

The Public Garden is a separate entity, accessed via a walkway from the entrance of the Home. The garden is to be viewed as a public park to encourage the community to participate in activities within the park and to encourage social interaction between the community and the residents. To encourage participation a covered stage is situated in the middle of the of the garden so plays, concerts, readings and other events could be presented by either the residents or community. A smaller more intimate seating area is situated in the northwest part of the garden with a central sandbox surrounded by benches. This area is intended especially for visiting children and grandchildren and is somewhat removed from the Home, where toys, tricycles and wagons can be brought out from the Home for young children to play with.

A shaded seating area along the public sidewalk is provided for the residents to watch the annual parade that kicks off the Gimli Summer Festival. Every year the residents line the side of the street to watch the parade winds its way down 1st Avenue and back.

The planting in this garden is used as a backdrop to activities and not as focal points in the garden. The trees provide protection from the elements for all activity areas and shrubs are used as screening tools from the parking lots and back lane.

A proposed public walkway extends from 2nd Street to 1st Street, located along the north side of the staff parking area and bisecting the Public Garden space. The walkway is intended to encourage use of the area and improve pedestrian flow.

Sidewalk

Parade Viewing Area

Signage

Grassed Area

Seating

Flower Beds

Pavilion/Stage

Seating/Play Area

Visitor Parking

Staff Parking   Vertical Trellis

Walkway

Shrub Beds

N

0   5   10   15m

Figure 34.   Plan Detail : Public Garden

BETEL PERSONAL CARE HOME

58

Seating/Play Area   Pavilion/Stage   Seating

1st Avenue
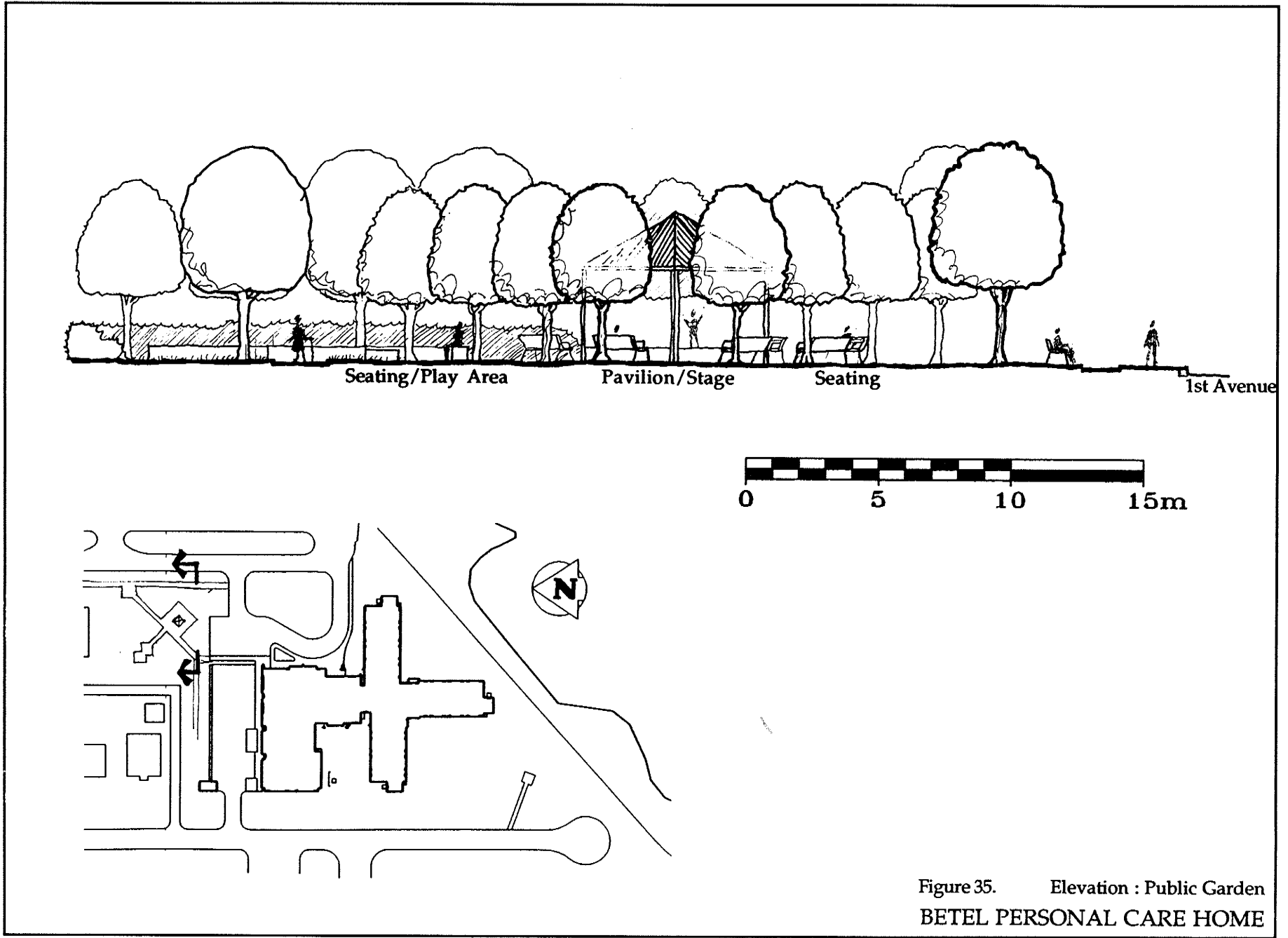
0   5   10   15m

Figure 35.   Elevation : Public Garden

BETEL PERSONAL CARE HOME

Remedial Action

The existing entrance, drop-off and courtyard areas were designed by David Wagner Associates Inc. of Winnipeg, MB and were installed after building completion in 1989. Suggested remedial measures are proposed for these areas to maintain the continuity of the overall site design.

The entrance and drop-off area has been modified as follows:

a) Several coniferous trees have been removed that were blocking views from residents windows. It is believed that these trees were originally planted to screen the windows from vehicle headlights in the drop-off area. Good quality blinds on the affected windows are a better alternative.

b) The face of an existing berm has been planted with annuals and perennials to enhance the view from the main lobby and residents windows facing the drop-off area.

c) Foundation planting beds have been added along the northern side of the east wing of the building, similar to those utilized in the Social Garden.

The courtyard area has been modified as follows:

a) Permanent raised planting boxes for vegetables have been added. The patio has been expanded to permit access on all sides of these new planters.

b) Foundation plantings have been added and existing shrub beds have been expanded to create a more lush atmosphere in this shady space.

c) Sod has been removed from inaccessible areas.

d) The existing fence has an institutional quality and it is recommended that this fence be removed and replaced with one of similar design to that found in the Sensory and Social Gardens.

New Shrub Bed

New Flower Bed

New Flower Bed

New Shrub Bed

New Flower Bed
New Raised
Planting Boxes

New Shrub Bed

Expanded
Shrub Bed

A   EXISTING ENTRANCE

B   EXISTING COURTYARD

A

B

0   5   10   15m
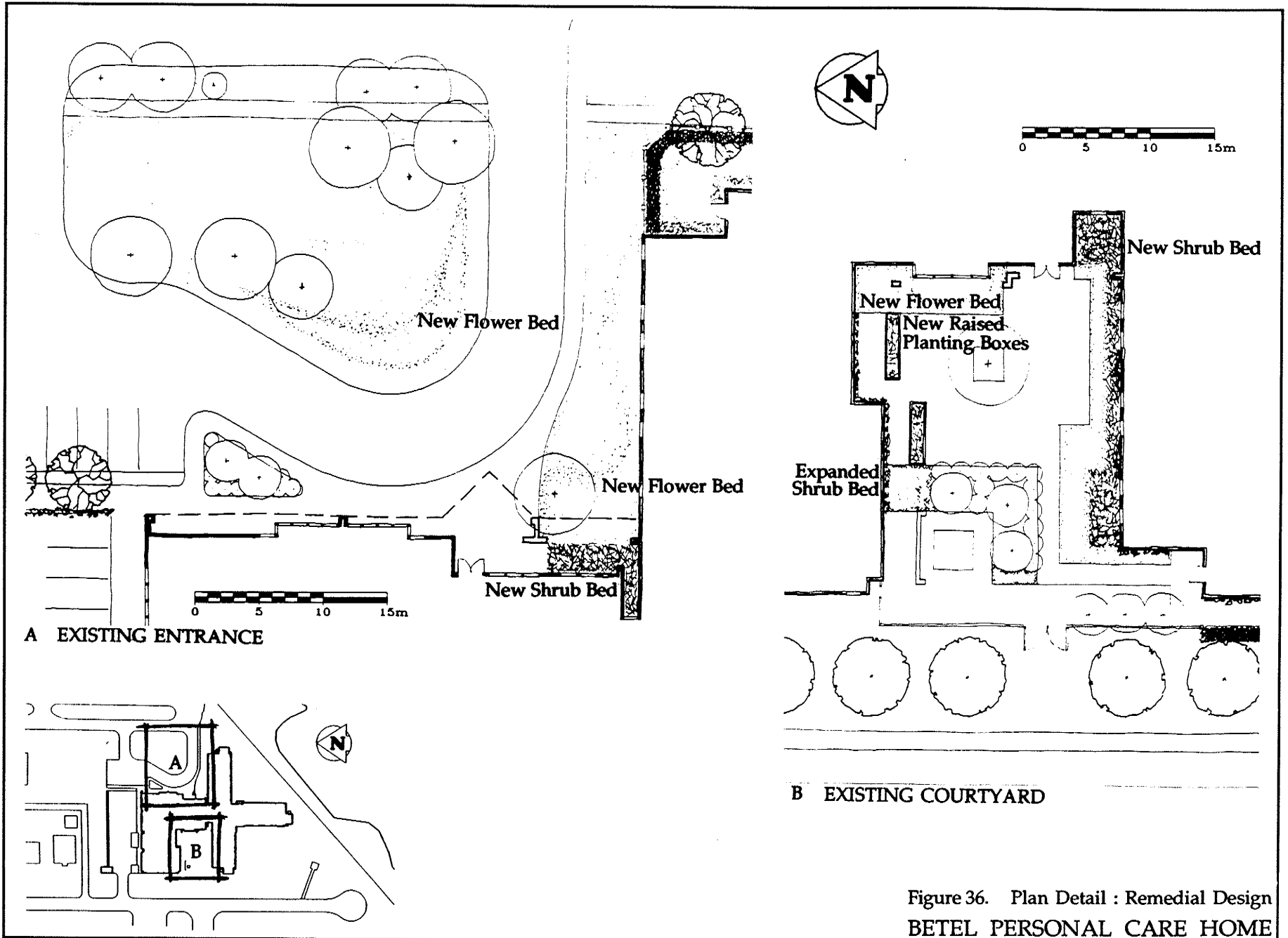
0   5   10   15m

Figure 36.   Plan Detail : Remedial Design
BETEL PERSONAL CARE HOME

Conclusions

To most people gardens are thought of as a retreat. A place to sit, read, observe or participate in. A place to set aside your worries and enjoy the pleasing surroundings.

It is in hope that a garden close at hand can bring joy and peace to people that have lived long and varied lives. To add a beautiful and enjoyable environment that will enhance and continually surprise through a constantly changing setting through the days and seasons of each and every year.

Three individual gardens have been created to serve different functions: a landscape for sensory enhancement, a social gathering place, and a public meeting place. The quality and diversity offered by these environments will hopefully result in greater personal quality of life for the residents of the Betel Personal Care Home.

A pleasurable environment by definition is dependent not only on the qualities that give it definition and character but more importantly on the nature of the person using it, his/her past history and current mood (Steele, 1973). Or put another way,

> Sometimes the most poignant qualities of a site come not from what is actually there, but from what is connected to it, through time and space, by our recollections and hopes. The vision, and even more powerfully the scent, of a blossom may remind us of a moment in our past... [17]

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[17] Moore, Charles W., Mitchell, William J. and Turnbull, Jr. William. The Poetics of Gardens. Cambridge, Mass: The MIT Press, 1988, p. 10.

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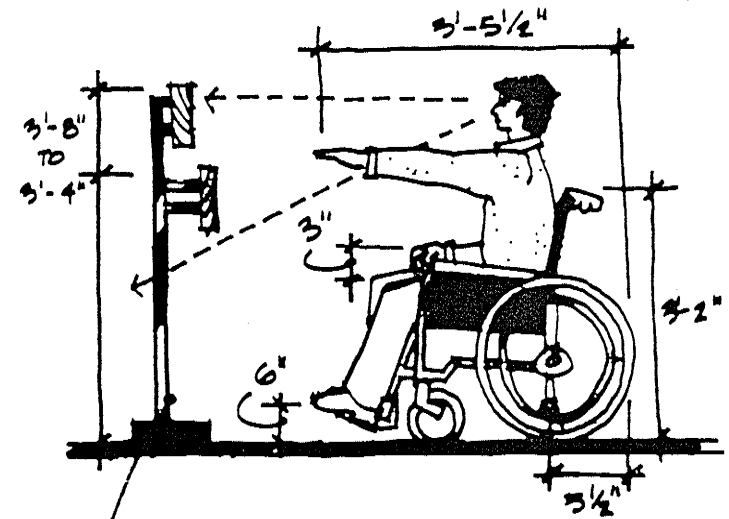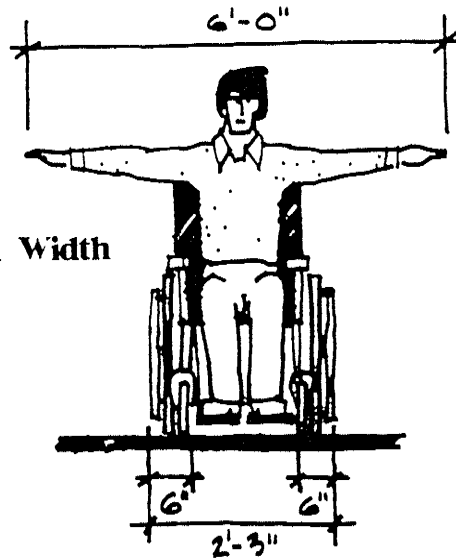Nostrand Company, 1975.

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Dimensions for Wheelchair·Bound People

Appendix A

*Anthropomorphics

1. Lateral Reach Width

6'-0"

6"   6"

2'-3"

3'-5½"

3'-8" TO 3'-4"

3"

6"

4'-2"

3½"

■ HANDRAILS AND RAILINGS BETWEEN 3'-4" AND 3'-8" WILL BE DIRECTLY BLOCKING THE VISION OF CHAIR·BOUND PEOPLE.

2. Forward Reach Length

Dimensions for People Outdoors
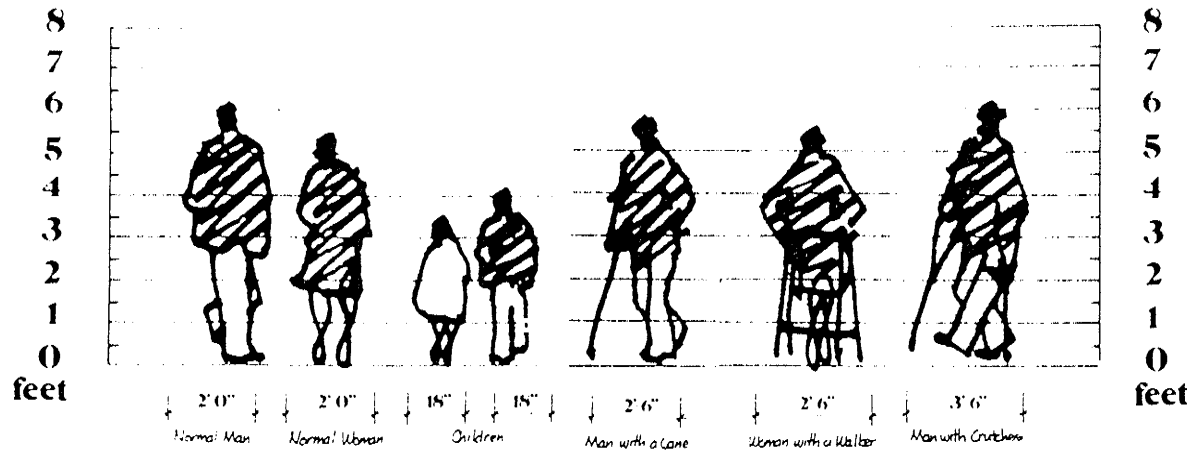
8
7
6
5
4
3
2
1
0
feet

2'0"   2'0"   18"   18"   2'6"   2'6"   3'6"

Normal Man   Normal Woman   Children   Man with a Cane   Woman with a Walker   Man with Crutches

8
7
6
5
4
3
2
1
0
feet

*Source: Robinette, Gary O. ed. Barrier-free Exterior Design: Anyone Can Go Anywhere. New York, N.Y.: Van Nostrand Reinhold Company Inc., 1985.

Outdoor Tables

▪ Table widths @ 18"/person.

▪ Table lengths @ 24"/person.

▪ Table heights @ 29"-33" avg.

▪ Round off or chamfer all exposed corners or sharp edges.

▪ Keep table tops smooth with no recesses that might hold water or food particles.

▪ Provide 18" clear leg space under table; measure from outside of table top to nearest support or table leg, etc.
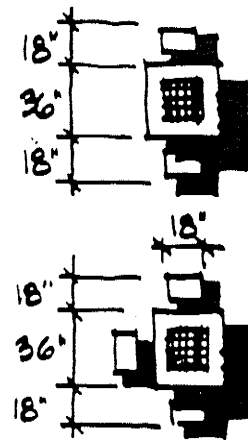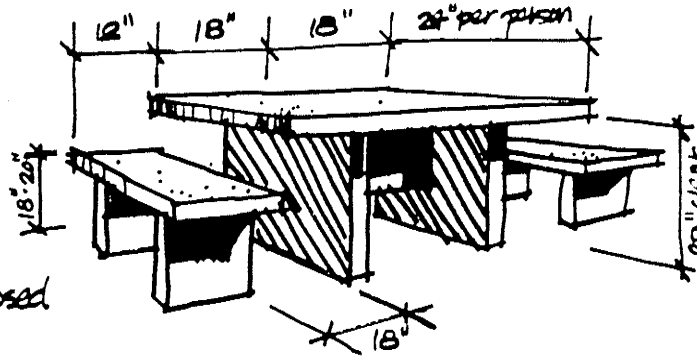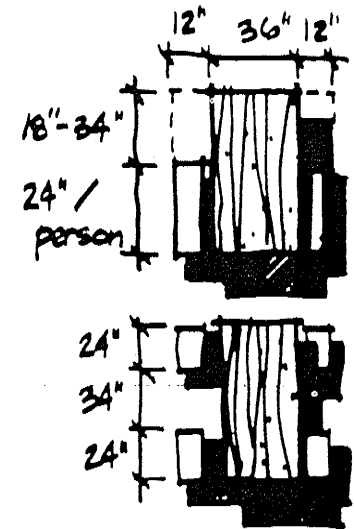
* Source: Robinette, Gary O. ed. <u>Barrier-free Exterior Design: Anyone Can Go Anywhere</u>. New York, N.Y.: Van Nostrand Reinhold Company Inc., 1985.

Game Tables   **Picnic Tables**

A2

12"
MINIMUM
(300 MM)

PITCHED SURFACE
FOR DRAINAGE.

24-30"
(610-760MM)

18"-22"
(460-
560MM)

PROVIDE HEEL SPACE
FOR EASE OF RISING

48" MINIMUM
(1200 MM)

48"
(1200 MM)

24"-26"
(600-650 MM)

12"
(300 MM)

7¼"
(175 MM)

26½"
(660 MM)

34½"-35½"
(880-900 MM)

WIDTH

6'   4'-5'   3'-4'   2'-3'

LINEAL SLOPE   1:50   1:20   1:12   1:8

MATERIAL SUITABILITY
  CONCRETE
  WOOD PLANK

* Source: Harris, Charles W. and Dines, Nicholas T. eds. Time
    Saver Standards for Landscape Architecture. New York,
    N.Y.: McGraw-Hill Publishing Company, 1988.

A3

4' (1.2M)   4' (1.2M)

SHELF FOR TACKLE, ETC. WITH
BACKING TO PREVENT ITEMS
FROM FALLING INTO WATER

FOOTREST ALSO PREVENTS ITEMS
FROM FALLING OFF THE DECK
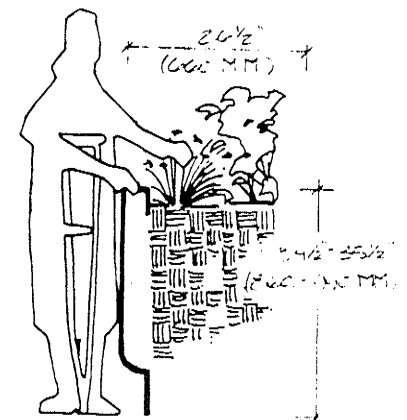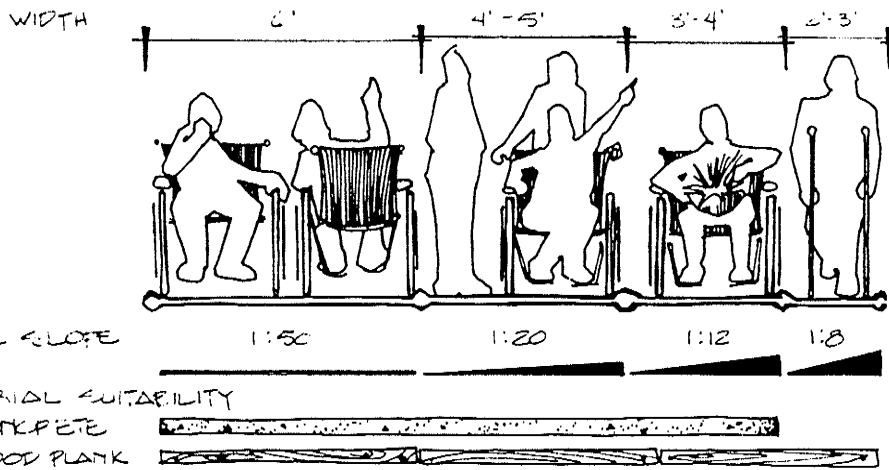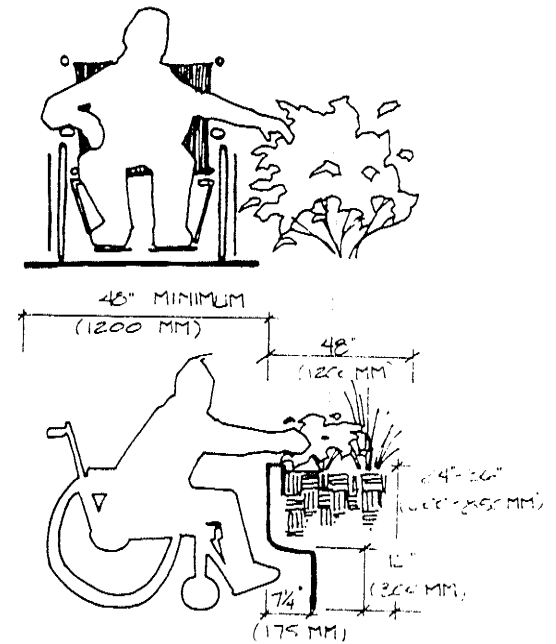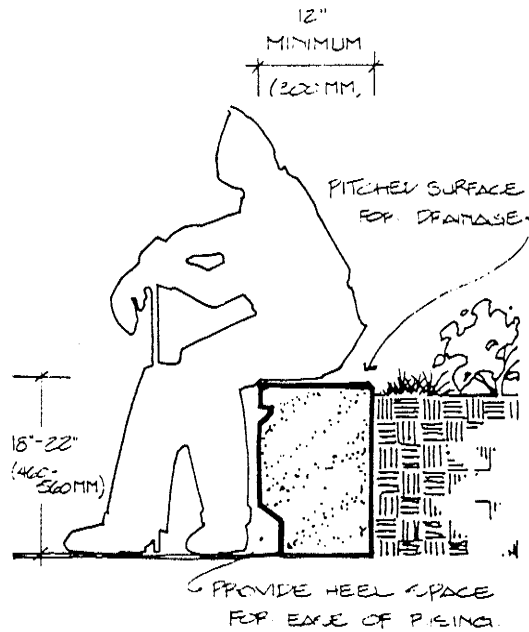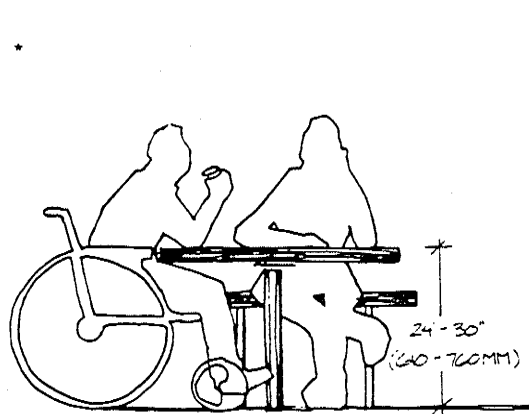
SECTION
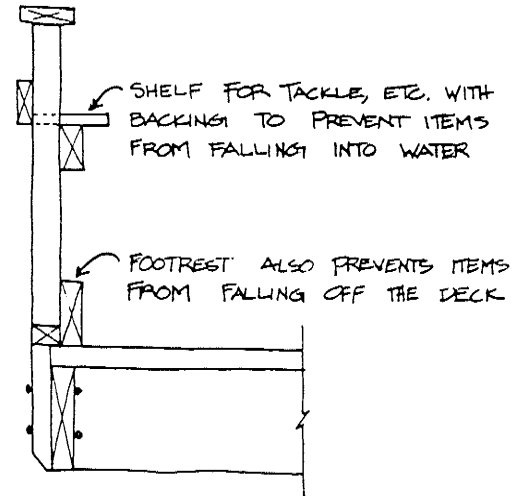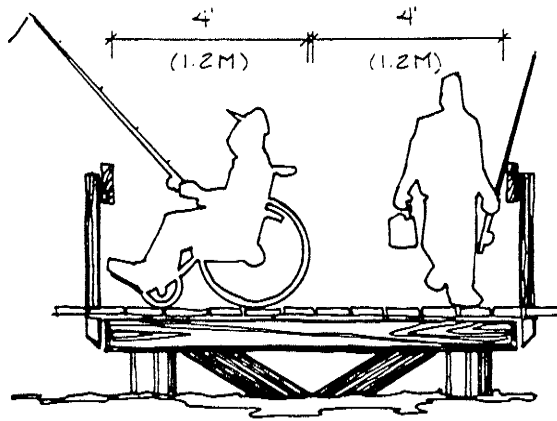
4' (1.2M) SHELVES
WITH 6' (1.8M) OPENINGS BETWEEN
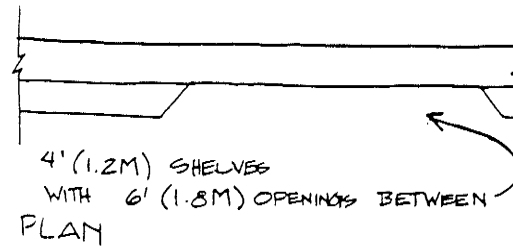
PLAN

* Source: Harris, Charles W. and Dines, Nicholas T. eds. Time
Saver Standards for Landscape Architecture. New York,
N.Y.: McGraw-Hill Publishing Company,1988.

A4

Appendix B

Solar Analysis

The Sun's position in the sky is described by two parameters: Azimuth angle and Altitude angle. The Azimuth is the angular direction of the sun in a horizontal plane, measured from the south being 0°. The Altitude of the sun is the angle above the horizon; the maximum daily Altitude occurs at solar noon, and the minimum occurs at sunrise and sunset when the sun crosses the horizon.
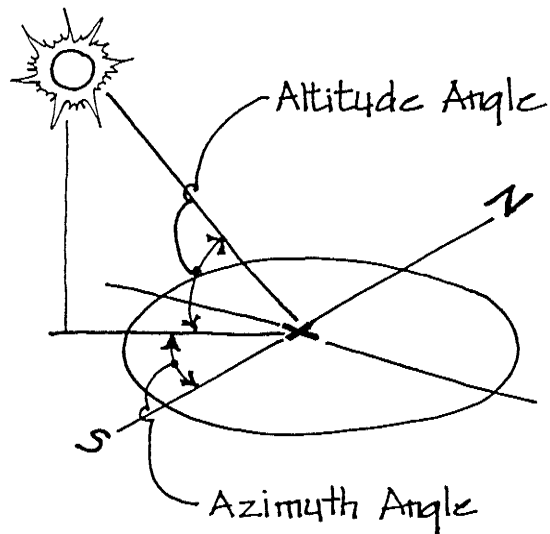
The sun appears to move across the sky in a circular path. The angle between the plane of the sun's path and the horizon never changes. However, the declination of this path does change throughout the year due to the 23° 27' tilt of the earth on its polar axis. The day on which the sun reaches maximum declination of +23° 27' occurs on or about June 21 and is known as Summer Solstice. Similarly, the day on which the sun reaches its minimum declination of -23° 27' occurs on or about December 21 and is known as Winter Solstice. The times of the year when the sun is at 0° declination occur on or about March 21 and September 21 and are known as Equinox (meaning equal day and night). Without this declination, days and nights would always be of equal length and there would be no seasons.

Knowing the Latitude LAT (in degrees above or below the equator) of a place and the declination D of the sun on a particular day (ie: June 21, declination = +23° 27'), the Azimuth Az and Altitude Al angles can be calculated at any hour H of that day (expressed in degrees before or after 12 noon, knowing 24 hrs = 360°, therefore each hour represents 15°)

with the following formula:

$$\sin Al = \cos D \cos LAT \cos H + \sin D \sin LAT$$

$$\sin Az = \frac{\cos D \sin H}{\cos Al} \quad \text{[1]}$$

For example, Gimli is 90° 38' North Latitude. On June 21, the solar declination is +23° 27'. At 11:00 am, the hour expressed in degrees would be +15°, the Altitude angle would be 60° 28' and the Azimuth angle would be 28° 47'. Altitudes less than zero indicate periods before sunrise or after sunset. Positive Azimuth indicates the angle East of South (before noon) while negative Azimuth indicates the angle West of South (after noon).

However, if one were to go out at 11:00 am on June 21 at Gimli, one would find that the sun is not at the Azimuth and Altitude angles calculated above. This is because of the difference between Solar time and local time, which usually differs. While it may be noon in a certain time zone, the sun is only at its highest Altitude angle at one particular longitude in that time zone. The difference between local time and solar time can be calculated with the following formula:

$$ST = LT - DST + ET + 4(LSM - LON) \quad \text{[2]}$$

Where ST is solar time, LT is local time, DST is the daylight saving time correction, ET is an equation correction factor in minutes (in June, ET = -1.4 minutes, in September +7.5, in December +1.6 and in March -7.5), LSM is local standard meridian (Central Time zone = 90°W) and LON is the local longitude (90° 59' West at Gimli). The factor 4 refers to the number of minutes of time required for a 1° rotation of the earth (24 hrs x 60 min/hr = 1440 min/360° = 4 min/°). For example, 11:00 am local time on June 21 at Gimli would be equal to:

11:00 am - 1 hr - 1.4 + 4'(90° - 96° 59') = 9:31 am
solar time

Using this formula, it can be found that Solar noon on June 21 in Gimli actually occurs at 1:29 pm local time. Using all the above formulae, the Azimuth and Altitude were computed for various hours of the day on June 21 and September 21. The result of these computations can be seen in the following tables:

---

[1] Lynch, Kevin and Hack, Gary. Site Planning: Third Edition. Cambridge, Massachusetts: MIT Press, 1984. Appendix E, Sun Angles, p 107.

[2] Packard, Robert T. ed. Ramsey/Sleeper: Architectural Graphic Standards: Seventh Edition. New York, N.Y.: John Wiley & Sons, Inc., 1981. p 77.

```
Solar Angles for Gimli
Date :       June 21       (Summer Solstice)

            (degrees)    (radians)
Declination    23.500       0.410
Latitude       50.633       0.884

Local Time   Solar Time   Solar Time   Altitude    Azimuth
(hours)      (hours)      (radians)    (degrees)   (degrees)

   4.000       2.511       2.484       -8.752      34.541
   5.000       3.511       2.222       -2.549      46.878
   6.000       4.511       1.961        5.005      58.377
   7.000       5.511       1.699       13.535      69.316
   8.000       6.511       1.437       22.698      80.118
   9.000       7.511       1.175       32.170      88.626
  10.000       8.511       0.913       41.584      76.050
  11.000       9.511       0.652       50.424      60.801
  12.000      10.511       0.390       57.813      40.858
  13.000      11.511       0.128       62.275      14.572
  14.000      12.511      -0.134       62.221     -15.219
  15.000      13.511      -0.396       57.674     -41.369
  16.000      14.511      -0.657       50.238     -61.183
  17.000      15.511      -0.919       41.378     -76.353
  18.000      16.511      -1.181       31.958     -88.887
  19.000      17.511      -1.443       22.490     -79.875
  20.000      18.511      -1.705       13.336     -69.075
  21.000      19.511      -1.966        4.825     -58.129
  22.000      20.511      -2.228       -2.704     -46.613


Solar Angles for Gimli
Date :       September 21 (Equinox)

            (degrees)    (radians)
Declination     0.000       0.000
Latitude       50.633       0.884

Local Time   Solar Time   Solar Time   Altitude    Azimuth
(hours)      (hours)      (radians)    (degrees)   (degrees)

   4.000       2.659       2.445      -29.121      47.235
   5.000       3.659       2.184      -21.395      61.476
   6.000       4.659       1.922      -12.595      74.196
   7.000       5.659       1.660       -3.237      86.047
   8.000       6.659       1.398        6.256      82.322
   9.000       7.659       1.136       15.484      70.266
  10.000       8.659       0.875       24.003      57.128
  11.000       9.659       0.613       31.258      42.282
  12.000      10.659       0.351       36.557      25.340
  13.000      11.659       0.089       39.180       6.595
  14.000      12.659      -0.173       38.671     -12.711
  15.000      13.659      -0.434       35.125     -30.972
  16.000      14.659      -0.696       29.121     -47.235
  17.000      15.659      -0.958       21.395     -61.476
  18.000      16.659      -1.220       12.595     -74.196
  19.000      17.659      -1.482        3.237     -86.047
  20.000      18.659      -1.743       -6.256     -82.322
  21.000      19.659      -2.005      -15.484     -70.266
  22.000      20.659      -2.267      -24.003     -57.128
```

The length and direction of a shadow at a given time can be computed if the Azimuth, Altitude angle, orientation of the object towards the south and the height of the object are known. The direction of the shadow is simply the Azimuth plus 180°. The length of shadow can be calculated using the Altitude Angle and the height of the object with the following formulae:

$$LS = \frac{Ht}{\tan(Al)}$$
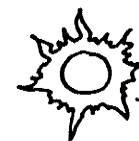
$$TAN = \frac{OPPOSITE\ SIDE}{ADJACENT\ SIDE}$$

HT

Altitude ANGLE

LS (LENGTH OF SHADOW)
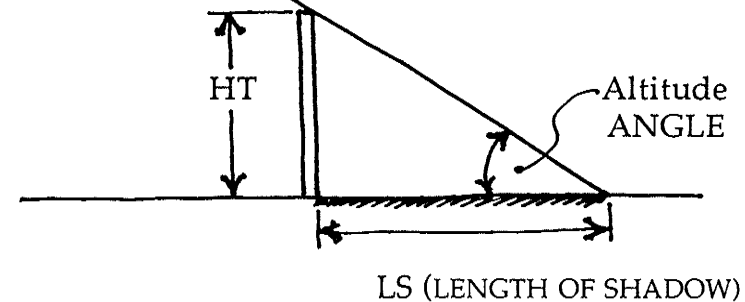
* Sources:
  Lynch, Kevin and Hack, Gary. Site Planning: Third Edition. Cambridge, Massachusetts: MIT Press, 1984.
  Packard, Robert T. ed. Ramsey/Sleeper: Architectural Graphic Standards: Seventh Edition. New York, N.Y.: John Wiley & Sons, Inc., 1981.

Appendix C

Wind Analysis

The severity and direction of wind is an important consideration when designing any outdoor space. Special diagrams called 'Wind Roses' were plotted showing the velocity and direction from which the wind came from data provided by Environment Canada (Packard, 1981). Two wind roses were drawn, one showing the velocity/direction distribution over the entire year and the other showing the distribution for the months of May, June, July, August and September.

Wind data was collected at the Gimli Environment Canada Weather Station (Environment Canada, 1985). This station is located about two blocks inland and three blocks south of the Gimli Betel Home and as a result, some of the winds experienced at the Betel Home coming off of Lake Winnipeg may not be represented by the wind roses.[*]

The following are tables of direction and wind speed for the year and the average of the five months of summer from May to September.

```
Wind Analysis : Gimli , MB
Percentage Frequency of Wind Speed in km/h by Wind Direction

Month :   Yearly Total        Calm :        2.60 %
```

Direction	1-5	6-11	12-19	20-28	29-38	39-49	Total
N	1.28	4.20	5.24	2.29	0.18	0.01	13.20
NE	1.03	3.42	2.03	0.73	0.13	0.01	7.33
E	1.41	3.43	1.91	0.82	0.18	0.03	7.77
SE	1.16	4.29	3.91	1.15	0.06	0.00	10.57
S	2.12	6.58	5.10	2.44	0.29	0.00	16.53
SW	1.46	4.58	2.55	0.75	0.12	0.02	9.48
W	2.32	7.88	4.10	1.68	0.35	0.04	16.37
NW	1.43	5.96	5.54	2.80	0.37	0.04	16.14

```
Month :   5 Summer Months     Calm :        1.82 %
```

Direction	1-5	6-11	12-19	20-28	29-38	39-49	Total
N	0.92	3.20	3.78	1.58	0.10	0.00	9.58
NE	0.76	3.34	2.24	0.84	0.20	0.02	7.40
E	1.24	4.10	2.44	1.34	0.36	0.06	9.54
SE	0.92	4.46	4.58	1.38	0.10	0.00	11.44
S	1.86	6.12	5.16	2.26	0.24	0.00	15.64
SW	1.50	5.40	3.38	1.08	0.22	0.02	11.60
W	2.52	8.68	4.78	2.32	0.56	0.06	18.92
NW	1.52	5.70	4.36	2.14	0.30	0.04	14.06

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[*] Sources:
Packard, Robert T. ed. Ramsey/Sleeper: Architectural Graphic Standards: Seventh Edition. New York, N.Y.: John Wiley & Sons, Inc., 1981.
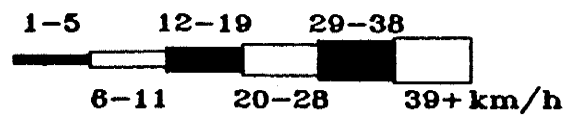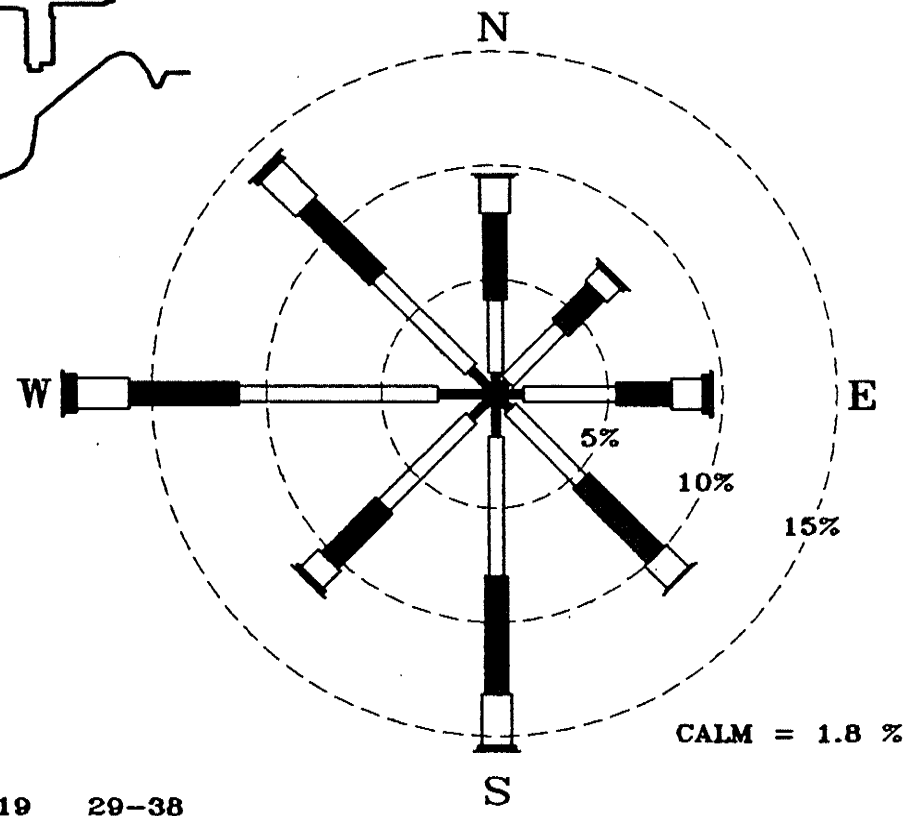
Environment Canada, Atmospheric Environment Source. Principal Station Data: Gimli. Minister of Supply and Services, Canada, 1985.

PERCENTAGE FREQUENCY OF WIND SPEED IN KM/H BY WIND DIRECTION

AVERAGE YEARLY WIND

SITE ORIENTATION
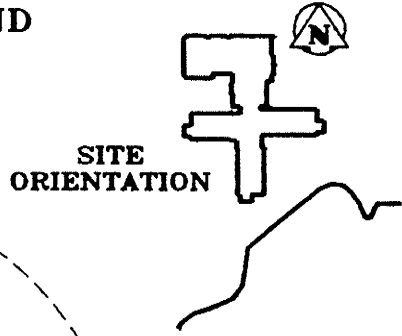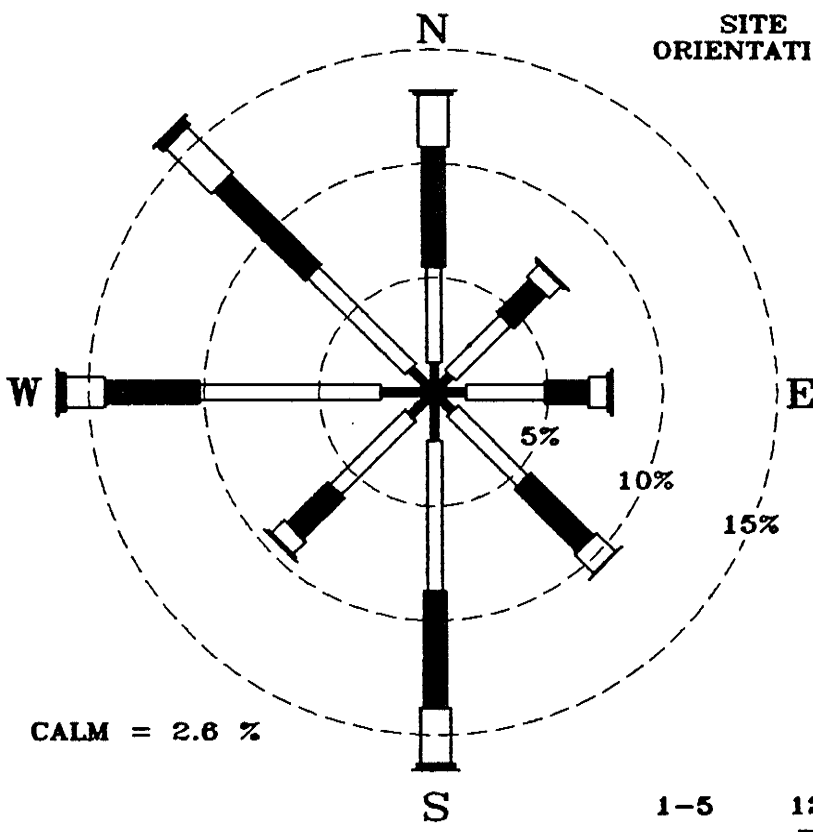
AVERAGE WIND FOR MAY, JUNE, JULY, AUGUST & SEPTEMBER

CALM = 2.6 %

CALM = 1.8 %

1-5   12-19   29-38

6-11   20-28   39+ km/h

C2

Appendix D

Plant Material

The following lists categorize plant species by their function in the garden.

Plants for Visual Enhancement

Plants with brighter colour in more intense hues can be planted to compensate for declining eyesight. Suggested plants for a colourful garden for all seasons are numerous and include annuals, perennials, herbs, vegetables and shrubs. The following species can be grown in the United States Department of Agriculture (USDA) climate zone 2 and are broken down by colour groups; red and pink, yellow and orange, white and silver, and blue and purple:

Common (Botanical Name)

1. Red and Pink
   Annuals
   Blanket Flower (Gallardia pulchella)
   Geranium (Pelargonium species)
   Flowering Tobacco (Nicotiana alba)
   Petunia (Petunia species)
   Pinks (Dianthus chinensis)

Poppy (Papaver nudicaule)
Scarlet Sage (Salvia splendens)
Sweet Pea (Lathyrus odorata)
Sweet William (Dianthus barbatus)
Snapdragon (Antirrhinum majus)
Zinnia (Zinnia species)

Perennials
Bee Balm (Monarda species)
Coral Bells (Heuchera species)
Peony (Paeonia species)
Pinks (Dianthus Deltoides)
Showy Stonecrop (Sedum Spectabile)

Shrubs and Trees
Honeysuckle (Lonicera tatarica)
Rosybloom Crabapple (Malus x astringens)
Shrub Rose (Rosa rugosa)

Species with Notable Fall Colour and Bark
Amur Maple (Acer ginnala) Red leaves in autumn
Burning Bush (Euonymus alatus) Red leaves in autumn
Siberian Dogwood (Cornus alba) Red bark on young twigs
Summer Cypress (Kochia scoparia) Annual that turns brilliant red in fall

2. Yellow and Orange

Annuals

Blanket Flower (Galiardia pulchella)

Calliopsis (Coreopsis tinctoria)

Marigold (Tagetes species)

Nasturtium (Tropaeolum majus)

Snapdragon (Antirrinum majus)

Sweet Pea (Lathyrus odorata)

Sunflower (Helianthus species)

Zinnia (Zinna species)

Perennials

Chrysantimum (Chrysanthimum species)

Goldenrod (Solidago canadensis)

Daylily (Hemerocallis species)

Sunflower (Heliopsis scabra)

Tickseed (Coreopsis species)

Yarrow (Achillea filipendulina)

Shrubs

Golden Varigated Dogwood (Cornus alba)

Golden Ninebark (Physocarpus opulifolius)

Goldflame Spirea (Spirea x bumalda)

Potentilla (Potentilla fruticosa)

Species with Notable Fall Colour and Bark

Amur Cherry (Prunus maackii) Yellowish bark

Birch (Betula species) Golden autumn foliage

Gold Twig Dogwood (Cornus alba) Yellow bark on young twigs

Green Ash (Fraxinus pensylvanica subintegerrima) Golden autumn foliage

3. White and Silver

Annuals

Babies Breath (Gypsophila elegans)

Flowering Tobacco (Nicotiana alba)

Perunia (Petunia species)

Snapdragon (Antirrinum majus)

Spider Flower (Cleome hasslerana)

Sweet Alyssum (Lobularia maritima)

Perennials

Artemisa `Silver King' (Artemisa ludoviciana)

Gas Plant (Dictamnus albus)

Lily of the Valley (Convallaria majus)

Pearly Everlasting (Anaphalis margaritacea)

Peony (Paeonia species)

Phlox (Phlox Carolina)

Pincushion Flower (Scabiosa caucasica)

Siberian Iris (Iris Siberica)

Sneezewort (Achillea ptarmica)

Shrubs and Trees

Crab Apple (Malus species)

Lilac (Syringa species)

Potentilla (Potentilla Fruticosa)

Spirea (Spirea species)

Species with Notable Fall Colour and Bark

Birch (Betula species) White bark

4. Blue and Purple
Annuals

Lobelia (Lobelia maritima)

Morning Glory (Convolvulus / Ipomia species)

Petunia (Petunia species)

Sweet Allysum (Lobularia erinus)

Sweet Pea (Lathyrus odorata)

Perennials

Balloon Flower (Platycodon grandiflorus)

Coneflower (Echinacea purpurea)

False Indigo (Baptisia australis)

Gayfeather (Liatris species)

Globe Thistle (Echinops ritro)

Harebell (Campanula species)

Pincushion Flower (Scabiosa caucasica)

Purple Loosestrife (Lythrum salicaria)

Herbs and Vegetables

Purple leaved Basil (Ocimus bascilicum)

Red Leaf Lettuce

Shrubs and Trees

Purple Leaf Sand Cherry (Prunus cistena)

Juniper (Juniperus horizontalis)

Juniper (Juniperus scopulorum)

Schubert Chokecherry (Prunus virginiana)

Lilac (Syringia species)

Plants for Olifactory Enhancement

Plants with noticeable fragrance can be selected to compensate for declining olifactory capacity and to promote subconscious recollections based on these scents. Suggested plants for a fragrant garden are numerous and include annuals, perennials, herbs, vegetables and shrubs:

Common (Botanical Name)	Scent Producer

Annuals

Flowering Tobacco (Nicotiana alba) flowers

Marigold (Tagetes species) foliage

Scented Geranium (Pelargonium species) Many hybrids of this
plant and scents; peppermint, lavender, pine.

Sweet Alyssum (Lobularia maritima) Tiny fragrant blossoms

Sweet Pea (Lathyrus odoratus) Old-fashioned varieties are the
most fragrant

Sweet William (Dianthus barbatus) flowers

D3

Perennials

Bearded Iris (Iris species) flowers

Bee Balm (Monarda species) flower and foliage

Gas Plant (Dictamnus albus) lemon scented foliage

Gayfeather (Liatris species) flowers

Purple Loosestrife (Lythrum salicaria) flowers

Peony (Paeonia species) flower

Wormwood (Artemisia species) foliage

Yarrow (Achillia species) foliage

Herbs

Basil (Ocimus bascilicum) foliage

Chives (Allium schoenoprasum) flower and foliage

Dill (Anethum graveolens) foliage, seed heads

Mint (Mentha species) foliage

Thyme (Thymus species) foliage

Shrubs

Honeysuckle (Lonicera species) flowers

Juniper (Juniperus species) foliage and berries

Lilac (Syringa species) flowers

Pea Shrub (Caragana species) flowers and foliage

Shrub Rose (Rosa rugosa) flowers

Plants for Tactile Enhancement

Plants with varied touch-texture can be placed close at hand to seating areas to allow all people but especially those with declining eyesight, interaction with nature through touch. Suggested plants that have interesting texture are as follows:

Common (Botanical Name)

1. Smooth Texture

Birch (Betula species)   Smooth, papery bark

Cotoneaster (Cotoneaster species)   Smooth leaves

Gas Plant (Dictamnus albus) Smooth leaves

Peony (Paeonia species) Smooth leaves

Sedum (Sedum species) Smooth, succulent leaves

2. Hard, Rough Texture

Burning Bush (Euonymus species) Rough, corky bark

Ninebark (Physocarpus opulifolius)   Peeling bark

Spruce (Picea species)   Sharp needles, rough bark

3. Soft, Wooly Texture

Artemesia (Artemisa species) Soft foliage

Pearly Everlasting (Anaphalis margaritacea)

Petunia (Petunia species) Hairy leaves, silky flowers

Spruce (Picea species) Young shoots

Yarrow (Achillea species) Wooly foliage

4. Sharp Texture

Globe Thistle (Echinops ritro) Spiny seed heads, leaves

Juniper (Juniperus species) Sharp, scaley foliage

Ornamental Grasses (various species) Sharp, spiny seed heads

Pine (Pinus species) Sharp needles

Spruce (Picea species) Sharp needles

Plants to Attract Wildlife

Wildlife can be attracted to the garden to provide visual and auditory enjoyment and to allow interaction with nature. Attracting wildlife to the garden can be achieved by providing food, cover and water. The following is a list of plant species attractive to wildlife:

1. Plants to Attract Songbirds

A variety of plant species can be planted to produce seeds or berries, or attract insects that can be eaten by songbirds. The proximity of cover plants and hiding places from predators must also be considered when locating food plants in the garden.

Common (Botanical Name)

a) Food plants
Annuals
Loblia (Lobelia erinus)

Ornamental Grasses (various species)

Pincushion Flower (Scabiosa species)

Sunflower (Helianthus species)

Perennials
Blanket Flower (Gallardia x grandiflora)

Coneflower (Echinacea purpurea)

Pincushion Flower (Scabiosa caucasica)

Poppy (Papaver species)

Shrubs and Trees
Chokecherry (Prunus species)

Cotoneaster (Cotoneaster species)

Crabapple (Malus x astringens)

Dogwood (Cornus species)

Mountain Ash (Sorbus species)

Russian Olive (Elaeagnus angustifolia)

Shrub Rose (Rosa rugosa)

b) Cover Plants

Evergreen conifers such as Spruce (Picea) and Pine (Pinus) used for winter cover, dense shrubs and trees for nesting and perching.

D5

2. Plants for Hummingbirds

Hummingbirds are attracted by bright flower colours, especially the colours red and orange.

Common (Botanical Name)

Annuals

Scarlet Sage (Salvia splendens)

Snapdragon (Antirrrhinum majus)

Perennials

Coral Bells (Heuchera species)

Daylily (Hemerocallis species)

Bee Balm (Monarda species)

Shrubs

Honeysuckle (Lonicera tatarica)

Lilac (Syringa species)

3. Plants for Butterflies

The caterpillars of different species of butterflies have specific food plants that must be present, adult butterflies feed on nectar and can use a variety of different food plants.

a) Caterpillar Food Plants

Species	Food Plants
Monarch	Milkweed (Asclepias species)
Mourning Cloak	Willow (Salix species)
	Rose (Rosa species)
Red Admiral	Nettle (Urtica species)
Tiger Swallowtail	Willow (Salix species)
	Birch (Betula species)
	Cherry (Prunus species)

b) Adult Butterfly Nectar Plants

Annuals

Marigold (Tagetes species)

Nasturtium (Tropaeolum majus)

Sweet Alyssum (Lobularia maritima)

Perennials

Coneflower (Echinacea purpura)

Gayfeather (Liatris species)

Goldenrod (Solidago species)

Milkweed (Asclepias species)

Purple Loosestrife (Lythrum salicaria)

Shrubs and Trees

Honeysuckle (Lonicera species)

Lilac (Syringa species)

Appendix E

Annotated Bibliography

An annotated bibliography was undertaken to review indepth, key issues and concerns dealing with the elderly's environment. The following review of material stems from early research which helped to identify and focus the intent of this practicum. The review dealt with a wide range of subject matter which included the following:

1. Gerontology (the aging process)
2. Intrinsic qualities of community/neighborhood
3. Analysis, planning and design of congregate housing
4. Guidelines, planning and design of exterior landscapes for congregate housing complexes.

The review was a solid foundation for the beginning of the praticum process.

Gerontology

Byerts. Thomas O., ed. Environmental Research and Aging. Washington, D.C.: Gerontological Society, 1974.

Papers put forward to identify issues and problems in housing policies, and to identify key issues in the patterns and designing of housing. Some of the topics discussed are as follows; human engineering for the aged, aging and environmental forces, environmental adaptation of the aged and urban design for elderly. A good basis to start with in the designing housing for the aged. Geared toward designers to help them identify key issues in housing for the aged.

Foner, Anne, ed. Age in Society. Beverly Hills, Calif.: SAGE Publications, 1976.

A collection of papers focussing on the 'whole' age structure and its location in the total social setting. Aspects of structure and dynamics of age are discussed along with the interrelatedness of age grouping in society. Other topics include the impact of age structures of the individual on society, the interplay between structure and change in age systems, age segregation in modern society and age in society; structure and change.

Harris, Louis and Associates Inc. The Myth and Reality of Aging in America. Washington, D.C.: National Council on the Aging, 1975.

Discusses the public image of aging and the publics attitude toward aging. Documents through surveys and profiles older Americans views and attitudes about themselves along with contributions of the elderly to society, experiences of old age and the politics of old age. Ends with a discussion on improving public understanding of the aged.

Lawton, M. Powell, Winley, Paul G. and Byerts, Thomas O., Eds. Aging and the Environment: Theoretical Approaches. New York: Springer Publishing Co., 1982.

A book for readers interested in person-environment interactions, examines environmental match and mismatch and helps to improve the environment for the aged.

Interesting theoretical papers on man-environment interactions (the way in which people interact with their environment). Man-environment interaction is broken into three categories, 1. the design process 2. orientation to place 3. orientation to environmental processes. The design process is ignored in the papers but place is discussed in a number of the papers as well as the environmental processes. It is an important book for designers on the theoretical of environment and the aged.

Lawton, M. Powell. Environment and Aging. Monterey, California: Brooks/Cole Publishing Co., 1980.

The book is a general theoretical framework, called by the author an ecological model of adaptation and aging, to provide an understanding of the processes underlying a wide variety of behavior. The author categorizes it into macro (regional, urban and rural) and micro (residential unit and personal space) environments (context of population and context of individuals). Case studies sited are from the United States. The book also looks at important aspects of elderly living within the community, neighborhood, planned housing, institutions, etc; aging in the environment, how the environment affects aging. Emphasis is placed on the diversity of people and the diversity in solutions for all people.

Novak, Mark. Aging and Society: A Canadian Perspective. Winnipeg,University of Winnipeg: Nelson Canada, 1988.

A general overview of the history on aging in Canada as compared to other countries. Covers the history, biology, psychology and social aspects of aging as well as health, finances, retirement, housing and transportation, age segregation and integration. A good coverage of all aspects that influence aging. General design guidelines are even discussed throughout the chapters.

Spacapan, Shirlynn, and Oskamp, Stuart, eds. The Social Psychology of Aging. Newbury Park, Calif.: SAGE Publications, 1989.

A collection of papers concerned about the problems brought on by retirement and change of environment. A few of the subject headings found are as follows; caring for the elderly, the retirement transition, post retirement transition, retirement planning and problems, factors that contribute to life satisfaction in later life and consequences of person-environment transactions.

Spencer, Marian G., Dorr, Caroline J., ed. Understanding Aging: A Multidisciplinary Approach. New York: Appleton-Century-Crofts, 1975.

A collection of individual viewpoints on aging written by professionals with diverse backgrounds. Aging from infancy to old age is discussed in terms of societal structure, biochemistry, economics, psychology, sociology, nutrition, medical and religious aspects. It is written to accommodate nonacademic lay people so as to gain knowledge in the diverse subject of aging.

Spicker, Stuart F., Woodward, kathleen M., and Van Tassel, David D., eds. Aging and the Elderly: Humanistic Perspectives in Gerontology. Atlantic Highlands, New Jersey: Humanistic Press Inc., 1978.

A collection of essays on the aging by "humanists" from various disciplines; literature, history, art history, etc. It is an "effort to view the contemporary problems of the elderly in an aging society from the standpoint of other societies, past and present, other values , other cultural traditions, as well as our own, and thereby to enhance our understanding." (from the editor's forward). Interesting perspectives that illuminate the issues and concerns of the elderly.

Age Congregate Housing

Canada Mortgage and Housing Corporation. Housing for Elderly
People:Design Guidelines. 1987.

CMHC housing guidelines for elderly people who are
healthy and mobile enough to live independently.

The Canadian Council on Social Development. Housing the
Elderly.Ottawa, Ontario, 1976.

Proceedings from regional seminars and workshops held in
Winnipeg,Vancouver, Toronto, Montreal and Halifax.
Discussions focussed on housing design, location, tenant
involvement and quality of housing management. Issues of
emphasis were on choice in housing and availability of
support services as well as on status, security and
independence.

The Canadian Council on Social Development. Beyond Shelter: A
Study o NHA - Financed Housing for the Elderly. Ottawa,
Ontario, 1973.

A look into elderly housing to see if needs are being met
beyond the simple provisions of shelter. Needs such as social
services and facilities as well as characteristics and
preferences of users and extent of community activities. The
information is based on surveys and case studies so
recommendations can be made to help maintain independent
living for the elderly as late in life as possible.

Davis, Richard H. ed. Housing for the Elderly. Los Angeles,
California: Ethel Percy Andrus Gerontology Centre, University
of Southern California,1973.

Papers presented at a career development institute to provide
information and techniques for planning facilities and
services in age congregate housing. The papers are mainly on
planning, administration and funding. Papers relating to, or

affecting design issues and concepts in seniors housing are
listed separately.

Epstein, Don. Retirement Housing in Urban Neighborhoods: Some
Inner City Options. Winnipeg: Institute of Urban Studies,
University of Winnipeg, 1976.

A study on housing patterns and preferences of a study group
on housing type, neighborhood, social environment, facilities
(in house and in the neighborhood), activities, work and
mobility of the study group, also expenditure and social
assistance. There are implications and guidelines drawn from
the study for inner city housing.

Gelwicks, Louis E. and Newcomer, Robert J. Planning Housing
Environments for the Elderly. Washington, D.C.: National
Council on Aging, Inc., 1974.

Theme of book, housing is more then shelter alone it is a vital
interrelationship between housing and services. The authors
point to shortcomings in planning policies and their
implementations. Good discussion on individual, social and
physical interrelationships (how the environment affects a
person mentally and physically). Gives a good indication as
to what the environment is like to an elderly person. Areas
discussed are: needs and satisfaction, physical ie.
competence, lifestyle, economic, etc., states the problems and
suggests possible solutions.

_____. "Design Concepts and Issues." in Housing for the
Elderly. Edited by Richard H. Davis. Los Angeles, California:
Ethel Percy Andrus Gerontology Centre, University of Southern
California, 1973, pp. 20-28.

A good introduction into concerns and attitudes towards
seniors living accommodations. States the importance of
physical environment. Discusses outdoor space (park and
shopping) and how seniors use each space. Examples of
designed objects are given and the affect on seniors are

discussed along with the importance of a program in conjunction with the design concept.

Gutman, Gloria, and Blackie, Norman. Innovations in Housing and Living Arrangements for Seniors. Burnaby, B.C.: The Gerontology Research Centre, Simon Fraser University, 1985.

Papers from a symposium sponsored by the Gerontology Research Centre, Simon Fraser University and the Canadian Assoc. on Gerontology. Part V: "Design and Evaluation. Barrier Free and Prosthetic Design: Issues in Housing for Seniors". Specifics and examples on certain aspects detailing architectural design (which can also be related to landscape design) when it comes to aging factors that should be taken into consideration when designing for seniors. ie. light, texture, color.

Lawton, M. Powell. "Gerontological Research Institute, 1979, National Survey of Housing for the Elderly: Report on the Findings to Date." in Housing for the Elderly. Edited by Richard H. Davis. Los Angeles, California: Ethel Percy Andrus Gerontology Ctre., U. of Southern California, 1973, pp. 30-36.

A good cross-sectional survey of approx. 3,000 tenants and managers of seniors housing. Lists needs and concerns of the residents. ie. psychological, security and medical needs. Helps in determining priorities for siting of seniors housing and also provides planning and architectural guidelines based on aspects in the quality of housing.

Leeds, Morton. "Housing Directions for the Elderly." in Housing for the Elderly. Edited by Richard H. Davis. Los Angeles, California: Ethel Percy Andrus Gerontology Ctre., U. of Southern California, 1973, pp. 37-42.

States nature of housing stock for seniors; quality, income need, ethnic nuances (ethnic attitude towards the elderly and the changing attitudes in society), and social attitudes. The paper also points out the differences between ethnic groups.

Note: that these observations are based on U.S. stats from the early 1970's.

Mackinnon, Dolina F., and Angel, Jerome H. Housing Needs and Preferences Among Senior Citizens (West Vancouver). Vancouver, B.C.: University of B.C., 1957.

The study was concerned about adequate and proper housing. It is a study on living arrangements, needs and preferences of able-bodied seniors. While the study is over 30 years old, it is of continuing relevance in the respect that it states the need for continuing public education and community organization for low cost housing projects.

Mendritzki, Volker. Senior Citizen Village Concept. Vol I and II, Summary Report. Edmonton, AB: Alberta Municipal Affairs Innovative Housing Grants Program, 1983.

Based on an Alberta survey a feasibility assessment was undertaken on private development housing targeted at seniors. An assessment on the viability of particular housing alternatives and of current trends and issues in housing for seniors. Research into needs and acceptance of different housing approaches.

Myers, Phyllis. Aging in Place: Strategies to Help the Elderly Stay in Revitalizing Neighborhoods. Washington, D.C.: The Conservation Foundation, 1982.

The main subject of the book is the revitalization of neighborhoods for aging in place. Seems to have a good handle on the urban senior, their needs, wants, desires and concerns.

Newcomer, Robert J. "Consumer Input in Planning and Design." in Housing for the Elderly. Edited by Richard H. Davis. Los Angeles, California: Ethel Percy Andrus Gerontology Centre, University of Southern California, 1973, pp. 30-36.

This paper discusses the impact of seniors housing on services, property values and zoning in the "consumer" neighborhood (in other words services). Very basic information. Discusses analysis of neighborhood in terms of what is found at present and what might be needed in the future.

Rose, Edgar E. Housing Needs and the Elderly. Aldershot, Hants, England: Gower Publishing Co. Ltd.,1982.

The question, did market mechanisms work in ways which took account of the needs of the elderly? If so, how? and if not what were the obstacles? The author addresses seniors needs in regards to housing itself and not on the design or on the neighborhood.

Steele, Fred I. Physical settings and Organization Development. Reading, Massachusetts: Addison-Wesley Publishing Company, 1973.

A good basis to make people aware of their environment and the fact that we can make an effect on our surroundings. Lists the functions of the physical environment and gives an orientation of the physical surroundings and how we perceive them. A very basic approach that can be easily understood. There are suggestions to designers in the last part of the book that are good starting guidelines for the development of our surrounding environment.

Valins, M. Housing For Elderly People: A Guide for Architects, Interior Designers and their Clients. London, England: The Architectural Press Ltd., 1988.

Building types are compared and evaluated with main concern on design principles. It is a practical handbook for both architects and clients, deals a bit on site selection and planning. Interesting data comparison of 80's elderly housing between the United States and the United Kingdom. Good data base on the anthropomorphics of the elderly and handicap.

Zeisel, John. Low Rise Housing for Older People: Behavioral Criteria for Design. Washington, D.C.: U.S. Government Printing Office, 1977.

A compilation of a design competition that was used in research (design competition designed for use in research as well as the program it followed). Presented different designs as examples illustrating ways to achieve desired effects, rather then as prescriptive specifications. Behavioral factors played a role in research, and therefore, the designs. They give you visual images of the issues, describe problems and needs, possible design responses and examples of those responses. Addresses the concerns of both the building architect and landscape architect.

Site Development: Planning and Design

Carstens, Diane Y.. Site Planning and Design for the Elderly: Issues, Guidelines and Alternatives. New York, N.Y.: Van Nostrand Reinhold Co.,1985.

A thesis dealing with seniors congregate housing mainly for able-bodied but including ailing seniors. The book deals with issues, site planning and design for outdoor use with a summary and conclusion of the issues involved. It addresses the design problem of outdoor spaces surrounding planned housing development. General guidelines for spatial organization, design and detailing of outdoor spaces while encouraging support, variety, challenge and opportunities for control and independence in daily living.

Rattray, A. The Problems of Outdoor Spaces for the Elderly.
Winnipeg: Vertechs Design Inc., 1983.

A research paper to determine the most important
motivations, facilitators and barriers for use of outdoor spaces
for long term care facilities for the elderly. Excellent
Bibliography.

Thiessen, Ingrid A. Outdoor Space Surrounding Senior Citizen
Housing. Winnipeg, Manitoba: Library of the University of
Manitoba, 1983.

The practicum looked into three areas of research; the
elderly person, the ideological base and the housing
environment. Surveys were done within the Winnipeg area to
verify and substantiate principles and guidelines. Design
principles for outdoor space are outlined as well as a
formation of design guidelines based on conclusions from the
three areas researched.

Smith, William M. Behavior, Design and Policy Aspects of Human
Habitats. Green Bay, Wisconsin: University of Wisconsin, Green
Bay, 1972.

Proceedings of a conference on the ecology of human living
environments. Discusses human behavior, architecture,
regional and urban planning as well as medicine. Gives a
general overview of man and his relation to habitats (natural
and man-made environment) and the health and social
effects involved. Good basis for understanding man-
environment interaction.

Community/Neighborhood

Birch, David L., Brown, Eric S., Coleman, Richard P. The
Behavioral Foundations of Neighborhood Change. Boston,
Massachusetts: Joint Centre for Urban Studies, MIT, 1979.

Summarizes the results of a behavioral model on the
processes of neighborhood change as well as looks into the
structure and uses of a community analysis model. The model
simulates the behavior of individuals, households,
employers, builders and homeowners. Results are
accumulated to predict change over time and to note patterns,
attitudes and motivations of residences.

Greely, Andrew M. Neighborhood. New York: A Continuum Book
the Seabury Press, 1977.

A book broken into three categories to better give us an
understanding of neighborhood. The three areas are broken
into images of neighborhood, origins and future of the
neighborhood, and contributions of neighborhood to urban
life. The book is based on the idea that we act in the world of
our physical environment and this changes its shape so we
hold the destiny of our neighborhoods in our hands.

Golant, Stephen M., ed. Location and Environment of Elderly
Population. Washington, D.C.: University of Chicago, V.H.
Winston and Sons., 1979.

The book is a geographic perspective on aging and the aged.
Discussed are regional locations and migrations of the older
population and the relevancy of demographic processes
responsible. The author defines and explains the impact that
environments (occupied, used and experienced by older
people) have on activity or behavior of older people.
Categorizes the physical environment into settings (by
geographic scale - ie. room, dwelling, building, neighborhood
etc.) and suggests that certain roles and needs might be better
served at certain levels than at others. Focuses on the urban
neighborhood and deals with the way age differences
influence the nature of the environmental experience. He also
addresses transportation needs (urban and rural) of the
elderly and how well those needs are met. The final chapter
monitors and predicts the residential locations of older

people and the facilities needed to service them. Note, these are based on U.S. stats from the 1970's.

Gubrium, Jaber F. ed. Late Life: Communities and Environmental Policy. Springfield, Illinois U.S.A.: Charles C Thomas Publisher, 1974.

The papers in this collection deal exclusively on the environments of the aged. Discusses three kinds of age environments: physical, formal and cross-cultural environments; environmental policy of relocation and spiritual well-being; and focuses on small communities versus large communities discussing age, culture and modernization.

Hatch, Elvin, Biography of a Small Town. New York: Columbia University Press, 1979.

Discusses the makeup of small town U.S.A. in the past and its new origins of today. Talks about the patterns and principles of local organization and leadership as well as the hierarchy of the town communities. Draws conclusions for the future based on the past and present situation. Interesting to compare conclusions to what has actually occurred in the past twelve years.

Konig, Rene. The Community. Translated by Fitzgerald, Edward. London: Routledge and Kegan Paul Ltd., 1968.

The author has based the book on his belief that community is a basic form of society. He discusses the structure basis of community,as well as the social ecology, and typology. He differentiates between small and large communities along with the integration and principle of neighborhood. A good basis to begin to understand the forces behind community/neighborhood even though it is over 20 years old.

McMillan Heintz, Katherine. Retirement Communities: for Adults Only. New Brunswick, New Jersey: Rutgers-The State University on New Jersey, 1976.

The book discusses the market, impact analysis on the political front as well as the health care front of retirement communities. A good summary of findings at the end.

Ministry of Municipal Affairs, Community Planning Wing. Planned Retirement Communities. Toronto, Ontario: Ministry of Municipal Affairs, 1986.

Case studies based in Ontario for the purpose of planning for future retirement communities. The case studies involved the planning considerations, market identification, location, housing and services of the communities. Discusses future study considerations and conclusions of the study.

Myers, Phyllis. Aging in Place: Strategies to Help the Elderly Stay in Revitalizing Neighborhoods. Washington, D.C.: The Conservation Foundation, 1982.

The main subject of the book is the revitalization of neighborhoods for aging in place. Seems to have a good handle on the urban senior, their needs, wants, desires and concerns.

Stonewall, Linda. Country Life City Life: Five Theories of Community. New York: Praeger Publishers, 1983.

A comparative study of two communities, one urban and one rural. A knowledge base for understanding how communities are formed and changed. By using five theoretical frameworks the author clarifies the concept of community and helps to facilitate community research. The five theoretical frameworks are; human ecology, structural functionalism, conflict theory, social psychological approach and network-exchange analysis. There is an assumption that readers do have a knowledge base in sociology.

White, Michael J. American Neighborhoods and Residential
   Differentiation. New York: Russell SAGE Foundation, 1987.

   Defines neighborhood in terms of residential patterns of
   contemporary society and social structure, as well as in terms
   of the urban sociology, diversity and segregation. Very
   contemporary, based on North American values and ideas of
   metropolis magnitude which has some value to the prairies
   even though we don't have quite the same make up as a
   metropolis.

Zaris, James P., Thibodeau, Thomas, G. The Elderly and Urban
   Housing. Washington, D.C.: The Urban Institute Press, 1983.

   Three case studies on revitalization of urban neighborhoods
   and the elderly peoples response. Studies their housing, their
   views, their attitudes and their responses to change in the
   urban environment. Conclusions state how the elderly are
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