Interiority of a Disconnected Mind

By

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Abstract

As the population of New Zealand ages, the rate of people with dementia is also increasing, creating greater demand for specialised dementia facilities. However, few of these are located in the rural context that New Zealand is known for. In addition, as a society we have created a stigma around aged care, and tend to design un-home-like and institutional centres. The importance of creating a space that provides contextual features, appropriate wayfinding and therapeutic characteristics has been overtaken by the need to design for the efficiency of staffing requirements. Current settings and the relocation to a more urban living environment increases the confusion for those rural people with dementia, as there is little to prompt their memory or make them feel at home. This thesis proposes the design of a dementia care facility that reflects the lifestyle rural people have come from. It examines how these three aspects: context, wayfinding and therapeutic design can be included to enhance the design of a dementia facility, as well as create a space that is enlivening for the residents.

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1.0

Introduction

The thought of losing yourself while you're still living is a hard concept to grasp but this kind of loss is a reality for people with dementia. This process of loss commonly comes in the form of memory loss, but also affects 'language, attention, problem solving, planning and organising, and judgment' (Mental Health Foundation of New Zealand and Peters). Dementia is a colloquial term used to describe people who suffer from changes or damage to the brain (Mental Health Foundation of New Zealand and Peters), causing the brain's pathways and connections to die over time.

New Zealand as a whole has an increasing rate of people with dementia (Alzheimers New Zealand). Since the 2008 Dementia Economic Impact Report, the number of people with dementia has increased by 18% (Deloitte Access Economics i). Dementia affects 1.1% of the total New Zealand population, and is said to triple by 2050 (Deloitte Access Economics i). As an increasing numbers of New Zealanders become affected by dementia, the need for specialised care and support is becoming a prominent issue that needs to be addressed. There are a number of New Zealand facilities that provide care for people with dementia, but only a limited number of specialised facilities where all aspects of the condition are explored and addressed through design. This problem becomes apparent when families struggle to look after their loved ones at home rather than put them in an institutionalised aged-care facility.

The New Zealand Ministry of Health has set up a Dementia Care Framework which is in the process of being implemented by local District Health Boards (DHB's) (Ministry of Health). The framework suggested by the Ministry seeks to address the stigma around Dementia and the care facilities, while developing low budget activities within the community (Ministry of Health). These activities promote the connection of people with dementia to the community in an effort to bring back some of the normality of their life, which loss of memory has taken away. The Ministry of Health 'recognises that dementia care needs to be improved nationwide in a way that maximises the independence and wellbeing of the person with dementia and their family and whanau while ensuring safety and affordability of services' (Ministry of Health 1).

The 2011 Dementia Economic Impact Report identified that over \$900 million was spent annually on dementia care, with more than 60% going towards health system expenditures (Deloitte Access Economics iii). These health care systems provide elderly people with different levels of care and independence. However, the majority of care facilities have been designed to benefit the routines of the staff providing the care, rather than the dementia patients themselves (Keen 256). The current type of institutional living provided to people with dementia in New Zealand is detrimental to the health and

wellbeing of the individuals (Keen 256). These designed environments play a major role in the wellbeing and behaviour of people with dementia, who have lost their memory and judgment.

The act of finding their way around what seems to be a foreign environment can be aided by design cues to diminish levels of uncertainty (Marquardt and Schmieg 333). This aspect of aiding one's ability to wayfind is currently undertaken only at an institutional level, making the connections to a homelike environment less likely.

Successful aged-care facilities rely on clear demographic and geographic cues (Reynolds and Beamish 34). Due to the large increase in elderly needing institutional care, facilities focus on providing small rooms in multi-storey buildings often with limited outlook onto surrounding environments. These new environments can be particularly confusing for people with dementia as the majority of New Zealanders do not come from high density urban environments. This situation is particularly problematic for people from a rural background as they are unable to regulate environmental changes.

With a growing and ageing population, the need for dementia care centres in rural communities will become increasingly important. New Zealand has an opportunity to develop a rural dementia centre that fosters connectiveness and familiarity for the person with dementia and the facility, but still upholds all aspects of appropriate healthcare through design. **This thesis proposes to design a dementia care facility for people from a rural community that reflects the lifestyle they have come from.** The design proposes an environment that is both familiar and stimulating for the residents, while ensuring therapeutic and dementia-specific benefits.

2.0

Dementia + Spatial Design: Literature Review

This chapter provides an overview of existing literature on designing for dementia. It has been organised under the three headings of 2.1 contextual design, 2.2 wayfinding and 2.3 therapeutic design.

2.0

Dementia Categorisation

People with dementia face the following issues that are relevant to a spatial context.

Lighting issues:

Sensitivity to lighting — florescent lighting is too bright and clinical for a home-like dementia centre.

Causes sleep deprivation — sleep becomes disrupted as dementia progresses. With the addition of light therapy, the circadian rhythm can begin to go back to normal. This increases sleep at night, and reduces daytime napping and ‘sundown syndrome¹’ wandering.

Too much light — if a room has too much light this reduces the contrast between fixtures, furniture and surface materials. This creates confusion for someone with dementia as differentiating between objects becomes difficult (Victorian Government Health Information).

Material/surface treatment issues:

Level changes — large level changes become a challenge when the majority of residents have low mobility. Small level changes such as a lip between two materials, or the frame of a door become hazardous as residents tend to trip on these features.

Surface changes — changes with materials create confusion for residents. They can feel the texture underfoot, and can get a fright when this changes.

Contrast of materials — to ensure that residents can see objects, fixtures, and fittings, there should be a contrast between them. When the contrast becomes too large however, misperception can be created. Very dark colours should be avoided, and reasonably dark colours shouldn’t be placed right next to very light colours (Victorian Government Health Information).

¹ | Sundown syndrome - onset of confusion and agitation that generally affects people with dementia or cognitive impairment and usually strikes around sunset.

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Orientation	Fully orientated in time and place	Struggle with challenging problems and timing	Becoming disorientated geographically	Disorientation to both time and space	No orientation in time or geography
Memory	No significant memory problems	Minor memory inconsistencies	Short term memory is almost gone	Short term memory is seriously impaired	Extreme memory loss
Home and Hobbies	Have a well maintained home life	Problem remembering daily activities	Some chores may be forgotten	Can accomplish chores but may need help – and be reminded	Impossible to perform daily activities
Personal Care	Fully able to take care of their personal needs	Capable of personal hygiene	Reminders for some personal hygiene	Need help taking care of hygiene	Full assistance is needed
Community	Can function out in the world	Sometimes have difficulties with social activities	Needs some assistance in public areas	Accompanied to social events	Impossible to engage with community
Level of Care	Able to care for themselves	Possible extra home care	Dementia Facility	Dementia Facility	Hospital Care

Within dementia there are five stages that aim to categorise a person by their symptoms. This is shown in the table.

2.1

Contextual Design

“Contextual Design is a customer-centred design process that uses extensive field data as the foundation for understanding users’ needs, tasks, intents, and processes in order to design products and systems that meet both users’ and business needs” (Holtzblatt and Beyer).

The way in which individuals react to or understand situations is based on how they perceive these experiences or places. Perception influences and shapes an individual based on their past experiences and upbringing. The way in which we perceive space also affects how we react within the built environment. The individual relies on past ‘percepts, memories, attitudes, and preferences’ to create connections to a new space, or to orientate themselves within an old space. These perceptions are also the links that make people feel secure when entering unknown territory. The connections we attribute to a space are more often defined by objects and reference points and the relationship we have with them (Pop 212–215). As memory fails, these perceptions become more important for people with dementia because they become the connections with belongings and familiar environments.

The familiar environment of a home is not a luxury for people with dementia who are in care facilities. This familiarity is essential for people with dementia, yet when they reach the point where they need the most assistance, they are often placed in an institution with no familiarity whatsoever (Wildevuur et al. 22). For rural community members with dementia, these institutions do not provide the necessary perceptions of ‘things rural’. The dwelling is a major part of understanding identification and orientation and as such is the ‘central place of human existence’ (Haddad 90). Modern homes and institutions do not possess qualities that are congruent with rural typology and perceived as homelike (Haddad 96). For this reason, the psychosocial design of the physical environment is becoming a more researched aspect of health and wellbeing in dementia care patients (Morgan et al. 257; FISCHL).

Furthermore, as elderly people look for ‘personal interaction, informality, simplicity, slow social change, and little social differentiation’, rural communities are becoming more popular places to retire in New Zealand (Reynolds and Beamish 36). People are returning to the familiarity of a rural community they grew up

in. This in turn increases the need for rural nursing homes and dementia care centres, with greater connections to rural typology. The connection to a farming typography of grass, simple wooden dwellings, and animals may provide the congruent aspects that rural elderly require.

2.2

Wayfinding

Wayfinding is described as a visual representation to aid people in reaching their destination successfully (Passini et al. 685).

As dementia progresses, wayfinding ability is increasingly diminished or lost, along with the ability to process spatial configurations (Passini et al. 687). This interferes with the way in which people get from one destination to another, and in turn, can cause them to get lost in familiar or foreign situations. This also increases their agitation, confusion and anxiety (Passini et al. 694). A normal brain allows people to recognise and understand environmental cues, using them to orientate themselves within spaces, and anticipate impending environments. People with dementia struggle with processing many things at once, making the task of spatial orientation and remembering the destination too difficult (Passini et al. 694). These feelings become multiplied when a patient is in new surroundings (Marquardt and Schmieg 337). Environments such as nursing homes and dementia care centres can implement design techniques which aid the process of wayfinding to make reaching a

destination for people with dementia less stressful.

In addition, the inclusion of central communal spaces to orientate oneself has been proven to enhance the wayfinding abilities of people with dementia (Passini et al. 698; Marquardt and Schmieg 335). The person with dementia can use these spaces along with multiple reference points to get from one destination to another and from one decision point to the next (Passini et al. 698). Reference points should occur in a sequential and linear order to prevent confusion (Passini et al. 697). These reference points are commonly large visual cues such as architectural elements, fixtures, fittings, and furniture (Passini et al. 698; Marquardt and Schmieg 338). In particular Marquardt and Schmieg discuss the importance of reference points at directional changes which can be interpreted and remembered to support 'allocentric orientation'² (Marquardt and Schmieg 338).

Another of the more documented explanations for wayfinding difficulties is in the nature of the journey, such as the size and shape of the corridors travelled (Marquardt and Schmieg 335). Advantages of having minimal to no direction changes improves residents' wayfinding abilities, and enhances the 'direct visual access to all places relevant to the resident' (Marquardt and Schmieg 335). This design strategy requires less reliance on allocentric orientation or reference points (Marquardt and Schmieg 338). The narrowness of corridors has also been raised as a problem with clear wayfinding (Passini et al. 696). If corridors become a place for medical or maintenance equipment, they can cause circulation issues leading to disorientation and anxiety (Passini et

al. 696). This increase in anxiety can occur in institutional facilities where there is a large group of residents requiring more equipment and more corridors connecting spaces. The size of the facility significantly influences awareness, orientation, safety, security and regulation of stimulation. The smaller the centre, the more beneficial for people with dementia (Morgan et al. 262).

Care facilities can be designed to reduce anxiety and disorientation. These methods of spatial design align with the cognitive ability of someone with dementia who has minimal spatial orientation.

² | Allocentric orientation - Orientating oneself through the location of one object relative to another object, rather than objects relative to the body.

2.3

Therapeutic Design

Therapeutic design recognises peoples need's for connectedness. 'Connectedness is the state of being connected or related. It refers to the relationships people build with others and the benefits they bring to individuals as well as to society.' (Wildevuur et al. 52)

Loss of memory and deterioration of cognitive function causes people with dementia to feel a loss in connection with society. Humans have strong desires to be 'acknowledged and useful, playing a part in the development of society and being valued for who they are – and who they used to be' (Wildevuur et al. 110). Addressing this aspect in dementia care through design strategies can enhance the positive outlook of residents.

A designed environment that facilitates spontaneous social interaction and an 'attractive' appearance has been proven to enhance the mental wellbeing of people with dementia (The Eden Alternative; Reynolds and Beamish 37). Social encounters also help maintain a relationship to the community, and prevent the feeling of isolation and loneliness (Wildevuur et al. 52). The 'Eden Alternative' suggests including the residents in the decision process in care facilities, or encouraging them to take part in the maintenance of gardens and

grounds. This can provide people with a purpose, reducing the boredom of the residents and can be a way of replacing the job that they performed in their professional life (Wildevuur et al. 110; The Eden Alternative).

In a rural community animals have usually influenced a person's life. The therapeutic qualities of animals have also been seen as hugely beneficial to the wellbeing of elderly and people with dementia (Baun and McCabe 42; Walsh 473). Animals provide companionship, comfort, and security, while also decreasing agitation and increasing socialisation (Walsh 437). The human-animal companion bond has been recognised and plays an integral part in the 'Eden Alternatives' (Baun and McCabe 44; The Eden Alternative). For people with dementia, animals provide an outlet for 'sundown syndrome' and wandering (Walsh 44; Baun and McCabe 474) which can take pressure off caregivers and enhance the relationship between animal and human (Baun and McCabe 48).

Designing the physical environment to increase connections between people with dementia, the community, landscapes, and animals has become an important aspect of therapeutic design (The Eden Alternative). The principles used are explored through 'The 10 Eden Alternatives' to eliminate loneliness, helplessness, and boredom (The Eden Alternative). The 'Eden Alternatives' were devised by Dr. Bill and Jude Thomas and seek to provide a therapeutic environment for elderly to live in comfortably (The Eden Alternative). They place importance on providing elderly with connections to life outside institutionalised care and give meaning and psychosocial significance to residents.

However, alongside these specific connections is the more general connection between humans and nature. Biophilic design explores how nature captivates us and provides therapeutic benefits (Terrapin Bright Green). The notion that nature can be a source of distraction, an aide to problem solving and also assist harmonisation within our minds is explained through the 14 Biophilic aspects. Biophilic design is broken into three groups; nature in the space,

natural analogues, and nature of the space (Terrapin Bright Green). Nature in the space refers to how a person and their senses can be affected by nature. Natural analogues is how nature can be abstracted to be used in building form, or through patterns. Nature of the space is about principles that are created with spaces to generate an emotional response.

Therapeutic design is becoming an influential practice that looks at environment and how it can become a source of benefit for people in healthcare. This is important as it reduces the confusion and agitation in people with dementia (Day et al. 397). By using aspects of biophilic design alongside the Eden alternative, the connection between nature, community, animals, and the dementia centre will allow for a design that stimulates and benefits the residents. The design of nature within a space also provides a connection between therapeutic design and the contextual typology of a rural setting. Exploring and enhancing this connection to nature will seek to provide connections to past memories for rural people with dementia.

2.4

Dementia Spatial Aspects

Familiar site building styles
Familiar site materials
Familiar site typology
Views to familiar farming routine/
animals
Centered public spaces
Non-institutional scale
Circular corridors
Reference Points

14 Patterns of Biophilia

Visual connections with nature
Non-visual connections with nature
Non-rhythmic sensory stimuli
Thermal and airflow variability
Presence of water
Dynamic and diffuse light
Connection with natural systems
Biomorphic forms and patterns
Material connections with nature
Complexity and order
Prospect
Refuge
Mystery
Risk/peril

The Eden Alternative

Eliminate loneliness, helplessness, boredom
Connections to plants, animals, children
Relationships with others
Give back to the community
Creating daily variety
Meaningful activities
Medical treatment to aid life, not based around it
Residents to be included in decision making
Wise leadership

Mapping the main principles of Biophilic and The Eden Alternative with Medical research illustrates the compatibility, and overlapping produces clusters defined as key ideas.

From the connections diagram, twelve factors have been chosen to measure both case studies and design iterations against. They will become the design imperatives that all factors should meet to ensure successful design outcome of a specialised rural dementia facility. Dementia-specific design aspects are included in the categorised therapeutic design imperatives.

Contextual Design

Wayfinding

Therapeutic Design

Rural Building Typology

Residential Scale

Human-Animal Companion

Rural Materials

Circulation

Community Interactions

Rural Landscape Typology

Central Communal Spaces

Connections to Nature Physically/Abstracted

Visual Connections to Farm Animals

Reference points

Sensory Stimulation

3.0

Case Studies

To explore best practice, a number of case studies in New Zealand have been reviewed, and provide an insight into the facilities currently available for people with dementia. The author visited each facility during 2015, conducted a series of informal interviews with staff and observed residents' behaviours to determine issues with design that are not recorded in the literature. This chapter explores three case studies in New Zealand that were chosen by their location and their specialised dementia building refurbishments.

3.1

Te Hopai

CCM Architects + Opus

Wellington

September 2008

Residents: 16

Te Hopai is a purpose-built facility completed in 2008. The facility was built in connection to an existing resthome and hospital. It was designed to facilitate wandering and provides a circular loop track joining the 16 bedrooms (with ensuites) to the central common area.

Strengths:

- Openable windows reduces the feeling of containment

- Residential scale and materials provide comfort to the small number of residents

- Continuous circular walkway facilitates wandering indoors and outdoors

- Central courtyard provides all bedrooms with external views and sunlight

- Activities such as animal days are often held

Weaknesses:

- Commercial hallways and fluorescent lighting provide an institutional feeling

- Communal area is at one end of the facility with a visible exit door, which residents cannot open

- Limited planting within the landscape, makes the security fence obtrusive in the outdoor area adjacent to retirement home grounds

- No sensory or biophilic features engage or stimulate the residents

- Residents have limited connections to animals or resident pets

- No contextual elements congruent with rural design exist for familiarity of place

3.1.1 | (opposite) Corridor view

3.1.2 | (opposite) Outdoor courtyard

3.1.3 | (opposite) Interior sitting area

3.1.4 | (opposite) Exterior garden

3.1.5 | (opposite) Te Hopai design imperatives

3.1.1

3.1.2

3.1.3

3.1.4

Rural Building Typology

Residential Scale

Human-Animal Companion

Rural Materials

Circulation

Community Interactions

Rural Landscape Typology

Central Communal Spaces

Connections to Nature Physically/Abstracted

Visual Connections to Farm Animals

Reference points

Sensory Stimulation

3.2 Kandahar Court

Masterton

Residents: 25

Kandahar is made up of two facilities that have been converted into retirement housing and dementia care. The secured dementia centre accommodates up to 25 residents and is broken into two areas dealing with different levels of dementia. The two wings have their own common areas and facilities subject to the dependency of residents. The building was originally purpose built for people with mental disabilities. Adjustments have been made to accommodate people with dementia and the issues particular to this group. This facility lacks in maintenance of some materials and spaces.

Strengths:

- Visual view shafts frame outdoor gardens and further connections to farmland (horse paddock)
- Circular corridors facilitate wandering
- Residential scale and materiality establish connection to place
- Flexible room layout mimics home arrangement and routines
- Connections with local community exist through activities with children
- Facility has a pet cat

Weaknesses:

- Materiality is not entirely suitable for dementia incontinence - for example carpet which holds smell.
- Obtrusive fencing to keeps residents in
- Typology is more institutional than homelike (see image 3.2.4)

3.2.1 | (opposite) Bedroom layouts

3.2.2 | (opposite) Outdoor garden

3.2.3 | (opposite) Interior sitting area

3.2.4 | (opposite) Corridor

3.2.5 | (opposite) Dining area

3.2.6 | (opposite) Kandahar Court design imperatives

3.3

Village in the Park

Newtown

Residents: 33

Village in the Park is a centrally located secure dementia facility. It is a purpose built building able to accommodate 33 residents with their own rooms and ensuites. All rooms look out onto manicured gardens, and a central common room is shared by the residents.

Strengths:

-Central communal dining and living areas, allow for residents to find these spaces easily

-Connections with younger generations through a day-care centre on site, create stimulation and provide entertainment

Weaknesses:

-Lacks familiar home-like features to allow connection to place; interior has institutional characteristics

-No circular walkway exists encourage wandering; the facility is shaped in a U formation, creating dead ends and confusion due to the similarities between the two wings

-Minimal landscaping in outdoor courtyard, additional seating and interactive planting would enhance this space

-Limited inclusion of Biophilic aspects in the interior as a stimulus for the residents

3.3.1 | (opposite) Lounge area

3.3.2 | (opposite) Ceiling panels - lighting

3.3.3 | (opposite) Exterior gardens

3.3.4 | (opposite) Outdoor seating area

3.3.5 | (opposite) Village in the Park design imperatives

International case studies provide leading design solutions and current experiments in design for dementia.

3.4

De Hogeweyk

Molenaar&Bol&VanDillen

Netherlands

December 2009

Residents: 152

De Hogeweyk is a purpose built secure dementia centre, designed to act as an everyday village for its 152 residents. There are 23 houses using different decor styles replicating the lifestyles in which these people have lived. This community is staff-run with its own entertainment and living utilities to establish a routine which is accurate to normal village life.

Awards:

- Hospitality Care Award 2010
- Nominated for the Hedy d'Ancona Award 2010, Excellence in Healthcare Architecture
- Golden label for Quality by Perspect 2006
- Project of the World, Expo 2000 Hannover
- International Hospital Federation Award 1995, for innovative management
- Dien Cornelissenprijs 1993 for privacy in nursing homes

Strengths:

- Staff-run living with assisted communal spaces, replicates a small town with its amenities for familiarity to daily regimes
- Multiple different interior décor styles suit the residents' prior standard of living, creating greater connection to place
- Central courtyards create visual connections to landscape and optimise daylighting
- Building forms a secure ring around site, providing a circular walkway facilitating wandering and security

Weaknesses:

- Modern external façade has potential to confuse residents with contrasting interior/exterior styles
- Exclusion from wider community interaction because entire community is present within secured site

3.4.1 | (opposite) Exterior connections between apartments

3.4.2 | (opposite) Interactive community aspects

3.4.3 | (opposite) Interior decor options

3.4.4 | (opposite) De Hogeweyk design imperatives

3.4.1

3.4.2

3.4.3

3.5

Care Housing

Oliver Chapman Architects
Scotland
2010

Care housing is a scheme to help integrate people with disabilities from an institutional facility into the community. These 14 semi-detached houses and shared services facility draw on domestic housing to get away from the institutional style that usually comes with disability care. This gives the residents independence. The houses have followed local typographies, using the traditional duo pitched roof with gables at both ends and followed familiar streetscape design.

Awards:

- RIAS Best Building in Scotland
Award Finalist 2008

Strengths:

-Congruent with familiar form used as a face then extruded triggers cognitive memory

-The use of timber panels as a façade treatment mimics traditional homesteads in a modern format

-Scale of rural housing is appropriate

-Visual outlook onto rural landscapes allows connections to familiar surrounds

Weaknesses:

-Modern angular window don't enforce the other homelike features

-Separated pods don't facilitate wandering or wayfinding, and become confusing with similar design and façade treatments

-Lack of landscape features beyond grass and small areas of plants, reduces sensory and physical stimulation

3.5.1 | (opposite) Exterior view of builds

3.5.2 | (opposite) 3D site image

3.5.3 | (opposite) Exterior view of materiality and landscape

3.5.4 | (opposite) Interior entry way

3.5.5 | (opposite) Care Housing design imperatives

3.5.1

3.5.2

3.5.3

3.5.4

3.6

Concoret Housing

Nomade Architects

France

2013

Concoret Housing is a facility made up of 44 one or two bedroom apartments. The design takes inspiration from the surrounding rural landscape, and adjusts its form to nestle into the hillside. This maximises the natural light and vast land expanse views on the opposite side. All apartments have a view of both landscape and internal courtyards. Materials are locally sourced to establish a connection to geographical place.

Strengths:

-Outlook onto rural landscape, creates memory connections with prior lifestyles

-Separate wing for communal activities and facilities stops confusion in wayfinding

-Natural materials are intergrated into external façade

Weaknesses:

-Interior void of detail allows no personal connection with space

-Plan and walkways with multi-levels and dead ends are confusing

-Modern detailing varies from the ordinary. This might create unease in the resident as how to use the features of the facility

-Large scale creates an institutional feeling

3.6.1 | (opposite) Overall building

3.6.2 | (opposite) Exterior

3.6.3 | (opposite) Exterior verandah

3.6.4 | (opposite) Living area

3.6.5 | (opposite) Interior corridor

3.6.6 | (opposite) Concoret Housing design imperatives

Rural Building Typology

Residential Scale

Human-Animal Companion

Rural Materials

Circulation

Community Interactions

Rural Landscape Typology

Central Communal Spaces

Connections to Nature Physically/Abstracted

Visual Connections to Farm Animals

Reference points

Sensory Stimulation

3.7

Herbergement Alzheimer a Paris

Philippon-Kalt

France

2012

The Herbergement is a refurbished facility that maintains the connections to the community with a historical programme. All aspects of the new 72-bed design were established to help facilitate cognitive memory and sensory experiences for people with dementia. The vibrant colours are used as a wayfinding key and help boost residents' morale. The seismic structural support on the exterior façade is a representation of bamboo stems, adding contrast between the two sides of the building.

Strengths:

-Vibrant colours and patterns distinguish between levels and areas of the facility

-Lush outdoor gardens with height provide views from all levels of the building

-Central communal areas and vertical circulation exist

-Interior finishings and exterior façade have bold and abstract design

Weaknesses:

-Dead end corridors allow no circulation for wandering or wayfinding

-Institutional scale and design allow no connection to place

-Design is modern and repetitive creating confusing wayfinding

-Site and material represent an urban typology congruent with locaion. These design aspects will look obtrusive in a rural context

-No connection to animals and the wider community exist

3.7.1 | (opposite) Landscape surrounding building

3.7.2 | (opposite) Opposite site of building

3.7.3 | (opposite) Interior colour-coded floor levels

3.7.4 | (opposite) Interior entry way

3.7.5 | (opposite) Herbergement Alzheimer a Paris design imperatives

3.8

Royal Children's Hospital

Billard Leece Partnership and Bates Smart
Architects
Melbourne
2011

The Royal Children's Hospital has established a new way of designing institutional facilities to benefit the patient and their recovery process. Using interior design, the architects have incorporated local geographical features and used them to create character. Louvers were established from blooming flowers and their petals, colours were taken from the surrounding landscapes, and art from local artists is displayed to name a few therapeutic design features. This is an example where biophilic design has been used to bring life and nature into a building successfully.

Awards:

- BPN Sustainability Awards: Best of the Best Award and Public Building & Urban Design Award 2012
- World Architecture Festival, 'World's Best Health Building' Award 2012
- Australian Interior Design Awards: Premier Award for Interior Design Excellence & Innovation, Award for Public Design, Best of State Commercial Design and Award for Colour in Commercial Design 2012
- IDEA: Overall Winner and Public Space Winner 2012
- World Architecture Festival, 'World's Best Health Building' Award 2012

Strengths:

- Appropriately brings colour, pattern and natural elements into the interior design of the facility
- Provides fun, stimulating and comforting environment for children
- Central fish tank provides a reference point vertically, and horizontally to establish wayfinding for users
- Natural colours and materials are incorporated where possible
- All rooms have views of surrounding courtyards or park landscape
- Visual stimulation with nature and animals is provided through the multi-storey fish tank

Weaknesses:

- As the programme is a Hospital, aspects such as scale, rural typology, rural materials and animals do not meet the design imperatives

3.8.1 | (opposite) Infant medical room

3.8.2 | (opposite) Interior fish tank

3.8.3 | (opposite) Private medical rooms

3.8.4 | (opposite) Receptions desk

3.8.5 | (opposite) Children's room

3.8.6 | (opposite) Royal Children's Hospital design imperatives

3.9

Summary and Reflection

Local and international case studies have identified which aspects of design need more exploration to function at a higher standard. These are rural scale, rural typology, community interactions, reference points, connections to animals, human animal companions, and sensory stimulation. There were also design aspects which can be taken and implemented, as they provide acceptable solutions to dementia design. This research combined with the first-hand experience gathered through site visits has provided a greater understanding of dementia and the issues that people with dementia face. This knowledge will inform design iterations and explorations to aid in the process of creating a specialised rural dementia centre which meets resident and staff requirements.

3.9.1 | (above) Case study comparison of design imperatives met, and those that need additional work

4.0

Site Analysis

Of, relating to, or characteristic of the country, country life, or country people; living in the country: the rural population; of or relating to agriculture.

One of the most important aspects of designing for people with dementia is creating visual connections between the environment they are in now and the past they have returned to when losing memory and cognitive ability. Using elements such as routine, lifestyle and familiar geographical environments can generate qualities of design that residents feel comfortable using and orientating themselves within.

The site plays a major role in creating a contextual connection between people from a rural community, and the proposed dementia centre. It requires a place that is congruent with features of typical rural typologies and landscapes. These features differ depending on where in New Zealand people have typically lived, and with this the design would also change. New Zealand as a whole is known for its large agricultural influences, where over 50% of the land area is classified as highly rural or remote areas (‘Highly Rural/Remote Areas’)(see fig.4.0.2). The Manawatu is the second largest region by area in the North Island, making it an ideal location to design a rural dementia centre (Statistics New Zealand 9).

4.0.2 | (above) Percentage of rural and urban land area in New Zealand

4.0.3 | (above) Comparison of people per square meter Manawatu (rural) – Wellington (urban)

4.0.4 | (above) Manawatu scenic views

4.0.5 | (above) Wellington scenic views

The Manawatu is dominated by agriculture. The extreme contrasts between the rural communities of the Manawatu and the urban setting of, say Wellington results in drastic difference in both visual elements and the density of people per square meter (see fig.4.0.3–4.0.5). The large, mostly flat expanse of the Manawatu allows for extensive views in all directions. The sense of freedom expressed in this landscape helps reduce the anxiety of being trapped, unlike the secured dementia centres in urban areas.

The Manawatu currently has a higher percentage of elderly compared with other regions in New Zealand. It also has a high percentage of people classed as middle aged, which provides a large number of people who will transition into the elderly age bracket in the immediate future (see fig.4.0.7) (Statistics New Zealand 17). This creates a market for current and future users of a dementia centre in the Manawatu.

4.0.6 | (above) Land mass of regions in the North Island

4.0.7 | (above) Percentage of people in the Manawatu by age bracket

Cottage

Villa

Bungalow

State House

- 4.0.8 | (above) Cottage
- 4.0.9 | (above) Villa
- 4.0.10 | (above) Bungalow
- 4.0.11 | (above) State House

The Manawatu holds many styles of buildings, some of which are visually consistent with what could be considered rural design. The most common architectural types are cottages, villas, bungalows, and state housing. With lower labour skill level and accessibility to materials, housing typologies were originally easily distinguishable between rural and urban design.

- 4.0.12 | (above) Breakdown of Housing types within New Zealand

Cottage

Villa

Bungalow

State Housing

What has been established visually and through an evaluation of plans is that these buildings all hold similar design characteristics while still maintaining their own individuality. Similar aspects include the duo-pitched roof, gable ends, locally sourced materials, and closed plan living. However, the problem is not with designing to the typographical characteristics of a rural community, but rather including these features while still upholding the necessary features of a age-care facility.

Accommodation and Facilities – Planning Allowances – 8 Residents			
Residents	Single bedsitting rooms	9.6 – 12m ²	96 m ²
	Single room including WC	15.3 m ²	-
	Double bedsitting rooms	14.8 - 16 m ²	-
	Bathrooms and toilets	8.8 m ²	70.4 m ²
			166.4 m ²
Communal Rooms	Lounges	2.3 m ² per person	18.4 m ²
	Dining room	1.5 m ² pp	12 m ²
	Handcraft or sewing room	15 m ²	15 m ²
			45.4 m ²
Kitchen	Pantry	12.15 m ²	12.15 m ²
	Food prep – cooking	42.5 m ²	42.5 m ²
	Washing up	15 m ²	15 m ²
	Cloakroom and staffroom	12 m ²	12 m ²
			81.65 m ²
Additional Rooms	Sluice room	6 m ²	6 m ²
	Laundry	20 m ²	20 m ²
	Linen store	8 m ²	8 m ²
	Cleaners store	4 m ²	4 m ²
			110 m ²
			331.45 m ²

Sizing is based on typical 40-person institution

In an urban setting a facility with 16 to 35 residents is considered large due to the number of staff required to take care of the residents at an optimal ratio of 1:4 in New Zealand (Harper 7). If this is then reduced to half (8 residents), the facility can be maintained in a smaller rural homestead without institutional aspects and sizing. This may create an aura of home care and appropriate context. The diagrams explore the programmatic specifications required to ensure that sufficient space is allocated per resident, and that additional staffing requirements are met (see fig. 4.015-4.016).

Currently dementia centres within the Manawatu are limited. Over the region there are scattered clusters, but none which are situated within a rural typology. The diagrams show the overall numbers of dementia centres and how these are placed in the region (see fig.4.0.18). From this analysis, it is clear that there is an opportunity for a dementia centre to be situated around the rural town of Bulls (see fig.4.0.19). Within this section of the Manawatu there is a former farming institution named Flock House, which provided agricultural training for people from 1923 to the 1980's (Heritage New Zealand). The site is situated 14kms away from the town centre of Bulls, located close to State Highway 1, and between the two cities of Palmerston North and Wanganui. This provides an accessible location for people using the state highway which bypasses the general site area and the proposed dementia centre. It is also beneficial in terms of health and safety, because it is close to local hospitals.

33 Aged-care Facilities

13 with Dementia Capabilities

1 Specialised Dementia Centre

Rural Area with no Aged Care Facilities

Feilding

Levin

Palmerston North

Dining Building

Student Common Room

Library - Study Rooms

Accommodation Blocks

Dining Building

Water Tank

Swimming Pool Interior

Homestead

Accommodation Blocks

Farming Equipment Left

Dining Building

Overgrown Pathways

Swimming Pool Interior

In the last 30 years the institution has become privately owned, and has changed ownership several times (Patsy McMillan). In this time some buildings have been sold, pulled down, or have become derelict. As a result, some of the buildings on site have been taken over by the local landscape, and are no longer usable. What is still present on the site are the historic homesteads, and some of the recreational buildings, such as the swimming pool, gymnasium, and training farm sheds (see fig.4.0.20).

Over the entire site there are two buildings which would provide the necessary building typographic, and space requirements. They are at the forefront of the site, and are two of the first buildings seen when driving through the entrance. The footprint of the one of the buildings is an L shape, providing limited to no allowance for circulation, where the other is in a stunted cross shape providing more possibilities. The smaller of the two buildings provides views that extend in all four directions of the site, making a direct visual connection between interior and surrounding landscape possible.

McKelvie Homestead

Farm Sheds

Swimming Pool and Squash Courts

With the most common symptom of dementia being memory loss, importance has been placed on creating a space which has qualities similar to, or reflecting designs from the past. Significant typographic features of historic domestic dwellings were analysed to gather an insight on what would be familiar and comforting for an elderly rural person with dementia. Popular designs have characteristics that are associated with building typologies. These characteristics help make connections to such generalisations as 'rural design'. Rural design in modern times can differ due to technology and individual style. This difficulty has been addressed through the use of an existing complex which was developed over time.

5.0

Design Phase 1

With the proposed area located in the surrounding farmscapes on the outskirts of the rural town of Bulls, there is limited visual and close contact to community influences to expel the sense of isolation, or increased random community interaction. The possibility of another program to support the dementia centre and provide life to the site has therefore been adopted. This also tailors the site to be able to perform as both a dementia centre and a community hub for people from a rural community.

	Rural activity	Estimated amount of space required	Age attracted	Dementia involvement	Human-animal interaction
Garden centre	Yes	One of the existing buildings	Young adults +	Residents can help with planting up pots, and with the up keep of the garden centre	No
Fix up of buildings for prior purpose (swimming pool, squash courts, gymnasium)	Yes	Existing buildings on site	All ages	Potential for aerobic swimming or physical therapy for the residents	No
Rural petting zoo	Yes	Enclosed and outdoor areas (large or small depending on size/number of animals)	All ages	Residents can help with feeding animals. Routine of feeding chickens or lambs in spring will bring back memories from past lifestyles	Yes
Horse riding school and stables	Yes	Large grass area – enclosed building for stables	All ages	Help with feeding	Yes
Golfing course/range	Yes	Large grass area – surrounding paddocks	Mainly middle-aged	No – mobility issues	No
Lawn bowls	Yes	Small grass area – with surrounding club	Elderly	With raised bowling beds – an activity for the residents	No

With limited agricultural community activities in the Manawatu, an acceptable programme to run alongside the dementia centre would be a petting zoo and horse riding school (see fig.5.0.1). These programmes will bring in people from both rural and urban communities and bring life to an area that currently has limited community input (see fig.5.0.2). With the influx of animals, engage the able dementia residents to help with feeding will provide a sense of worth and familiarity (Walsh 473). The ability to wander freely between community and dementia centre will enforce this aspect of freedom.

5.1 Movement

The idea of cross programming the site requires the use of additional buildings to be in close proximity to the dementia centre. The current farm sheds on site provide the necessary requirements to house animals and could be converted to a potential horse stables and petting zoo.

The initial design stage looks at the potential and downfalls of the site and chosen building. It considers how on a larger scale these can be adapted to best suit the current flow of the site while being influenced by the programmatic requirements of a rural dementia facility.

Initial studies were undertaken to understand the positioning of existing buildings on the site and how they might be adapted to best suit the wandering distances and the lighting qualities necessary for both therapeutic and health benefits. The cluster of community buildings on the eastern side of the property provides an opportunity to move the proposed dementia building closer to encourage residents to engage in activities outside the building.

Several potential layouts were tested to provide the best positioning on site. The chosen placement allows for easy wandering between buildings, and places the proposed dementia building as a central point within the site.

5.1.2 | (above) Analysis of current site and movement between buildings

5.1.3 | (above) Four concepts in moving the building

5.2 Orientation

5.2.1 | Sundial over the site

As lighting is directly related to our circadian rhythm, the importance of harnessing the natural light ensures a more normal circadian rhythm for people with dementia who typically suffer from sleep disruption. This influences the need for morning sun to be present where bedrooms are situated, and afternoon sun where living and communal areas are. This also encourages residents to get up in the morning and move through the building to enjoy both the sun and the company of others.

An initial sun study was conducted to evaluate the sun's path over the chosen building. This revealed that the longest side of the building faced north, capturing the majority of the daylight. As this side would most likely hold the majority of the bedrooms, the longest side should face east for optimal use of natural light in the morning. This meant that this building will require repositioning on the site.

New building position

Existing building position

With importance on familiarity and easy wayfinding throughout the building, certain programmes need to be connected to establish a route that is both circular and memorable. Identifying which internal spaces need to connect with one another to avoid confusion and overlapping in circulation, while also providing a central space for staff to keep an eye on residents is important. Figure 5.3.1 shows how each space should connect with another and also the surrounding landscape. This was assessed with both visual and physical connections to establish the location of the various programmes on the upper or lower levels of the building.

1. Double programmes over both levels. This splits up the residents into two smaller groups and disengages the top level from the bottom.

2. Locating bedrooms on upper level encourages the residents to spend less time in their rooms and more time in the public and outdoor areas.

3. Centralising the staff observation area with a loop of public spaces inside the perimeter of the building facilitates safe wandering and minimises confusion.

4. Staff areas are removed from the way of the residents and placed on the upper level, with bedrooms on the lower floor. Connection between resident and landscape is enhanced and mobility issues are reduced, with daytime activities centralised on one floor. This distances the staff and some public areas (such as the kitchen) from the residents.

Grouping the programmes into three categories (bedrooms, staff and communal areas) allowed for exploration of movement both horizontally and vertically. Testing possible methods of placing programmes within the existing building through sections has established the optimal connections. The literature and case studies examined identified that for wellbeing, residents should spend minimal time in their rooms and that a focus should be put on public or semi-public spaces. By placing bedrooms on upper levels, a physical barrier has been created for people with dementia due to their lower mobility. Increasing their connection to other people and the possible activities can expel boredom. To address the concern of negotiating stairs, an elevator has been introduced. Key design moves have been to:

5.4 Current building analysis

With these sizes and space allocations an initial study was undertaken to assess the existing building. The former use of the building had been as a short stay motel. This had similar programmatic requirements where every bedroom has its own bathing facilities. However, the historic layout lacked public spaces for residents to use during the day. Dual staircases allow for two methods of moving between levels and permitted a loop between them. The difference in materials and layout in the design of the stairs can allow them to become reference points when the interior of the space is opened up.

By removing the internal walls, the shell of the building can be used to design dementia-specific circulation around the programmes. In keeping the existing building rather than demolishing it, some of the agricultural heritage of the site is preserved and the building typology is familiar to local residents.

5.4.1 | (above) Current building plans Level 1–Level 2

5.4.2 | (above) Highlighting internal walls (current and removed)

5.4.3 | (above) Possible methods of movement

5.4.4 | (above) Movement diagram

5.5 Circulation

5.5.1 | (above) Intial interior-exterior circulation experiment

Providing connections between the interior and exterior both visually and physically is a key feature of the design. Using the current openings in the existing building, a circulation study has been undertaken to determine the best way to extend the threshold between interior and exterior. People with dementia tend to enjoy filtered sunlight, plants, and landscape, but not the exposed elements of sitting outside in some of the colder months. An exploration into creating an external form that doubles as a sun-room and indoor garden and that connects inside to outside reducing the exposure to the elements was conducted (see fig.5.5.1). The possible use of glass as a translucent skin ensures the visual connection to the surrounding landscape is not broken. However, the skin becomes an obtuse addition to the existing building, and would also be unusable as it would become too hot in summer (fig.5.5.2). This addition needs further refinement to possess the same typographic style as the remainder of the building.

5.5.2 | (above) Intial concept

A space study has been completed to determine sizing of programme elements and their possible positions in the building. As a circular loop is an important design feature, this has been examined to determine the most effective walkways around and through spaces. Keeping the existing staircases allows for vertical movement. However, with the agility of the elderly residents in mind, additional support may be needed. As the space requirements just meet the building footprint, additional services will exceed this and require an extension to the existing building (see pink overlay on fig.5.5.4).

5.5.3 | (above) Initial exploration of programme in existing building establishing bedroom numbers and layout

5.5.4 | (above) First devised floor plan

5.5.5 | (above) Initial public space concept

5.6 Breakout Spaces

Layout 1

Layout 2

Layout 3

Layout 4

5.6.1 | (above) Public space exploration of movement

To provide spaces that cater for both social and individual activities and reflect an adapted version of rural interior design, barriers need to be introduced into the current open plan living. Through initial analysis of the open space, four layouts have been explored, which would allow for the necessary segregation of programme elements. These layouts look at both large and small seating clusters, and how activities would be performed within. Creating walls that entirely cut off rooms may also cause confusion to the residents. Walls that partially divide rooms would be best.

5.6.2 | (above) Exploration into partial and closed plan public space layouts

Layout 1

An angular wall drawing people from the entryway down the corridor aids in wandering between the two staircases, and avoids sharp corners. Main segregating wall could put off residents from wanting to enter kitchen area.

Layout 2

Partial segregation of spaces creates three areas still interlinked. This layout encourages wandering between inside and outside, and between the two staircases.

Layout 3

Full segregation of spaces. Kitchen area, and two living areas have no visual connection. Similar layout to historic houses where corridor is used to connect all rooms. Limits interaction between residents.

Layout 4

Semi-partitioned walls segregating spaces. These spaces have limited visual connections but can be seen when wandering down the centre of the facility. Partition walls create narrow spaces which become problematic when arranging furniture, and considering residents with walkers.

5.7 Design Phase 1 Outcome

5.7.1 | (above) Plans Level 1 and 2

2 Rectangular table defines space between one resident and another. Circular table allows a resident to reach around to grab someone else's food with ease.

Wooden chairs allow ease with sliding from the side as handles are problematic. Material is easily cleaned.

With the limited number of residents there is no need for an industrial kitchen. An open kitchen encourages residents who are able to help with prep and get their own snack or cup of tea.

3 The option to bring residents' personal furniture makes a space more home-like, also provides them with a connection to past life.

With familiar objects such as fixtures, fittings, and decorations surrounding residents' the facility looks less like an institution and more home-like.

4 Timber flooring is a common feature in rural homesteads, and is present in the existing building. Allows for ease of movement with wheelchairs, walking frames, and residents who shuffle.

5.7.2 | (above) Kitchen design

5.7.3 | (above) Lounge design

5.7.4 | (above) Entry way

5.8

Summary and Reflection

This initial design phase looked into the site in an in-depth manner to establish a connection between the existing buildings and those that are visually identified as 'rural design'. The outcome of this resulted in the choice to keep the historic context of the site and retrofit one of the buildings for use as a dementia centre. The selected building holds significant characteristics which are congruent with rural design, such as fenestration and design details, use of local materials, and interior layout. This re-enforces a connection with the residents' past lifestyles. The exploration of the surrounding landscapes to ensure visual stimulation for residents also provides connections to prior daily routines. The concept explores circulation options through the interior and exterior of the building, and how this may be optimally achieved for wandering and wayfinding.

Positives:

- Problem and programmatic requirements for design decisions are clear
- Spatial elemental gives consideration to people with dementia and the need to facilitate circular wandering
- Choice of site provides building and landscape qualities congruent with that of a rural landscape
- The site is historically appropriate as prior uses also relate to the nurturing of these rural people
- Incorporates exploration into aspects of design which are determined by dementia
- Design highlights aspects of light to ensure wellbeing in residents

Things to consider:

- How far can the building be manipulated to benefit the residents with dementia, without losing the physical characteristics associated with rural design?
- How can the interior frame the landscape views more effectively, as if the farmer is looking out onto their farmland?
- How can the community/family visiting interact with the surrounding site as well as connect with residents and site?
- How can landscape techniques be used to create natural barriers between the dementia centre and the community aspects?
- How can landscape be used indoors to create abstracted stimulation?
- How can aspects of the design be adjusted to incorporate features that relate to a personal scale?
- How can the addition of materials and colour benefit the residents?

Contextual Design

Wayfinding

Therapeutic Design

Rural Building Typology

Residential Scale

Human-Animal Companion

Rural Materials

Circulation

Community Interactions

Rural Landscape Typology

Central Communal Spaces

Connections to Nature Physically/Abstracted

Visual Connections to Farm Animals

Reference points

Sensory Stimulation

6.0

Design Phase 2

6.0.1 | (above) Movement through the site

To understand how a space is used and which design features need to develop to accommodate a person with dementia, the scale of design moved from micro to a macro scale (fig.6.0.2). A person-to-feature analysis created a better understanding of how the space functions for the specific programme. A review of the daily routine of a resident living in the proposed dementia centre also provided further insight.

6.0.2 | (above) Macro to micro scale

6.1 Space Allocation

To ensure each resident has optimal space requirements for their bathing and sleeping, initial bedroom studies were explored as options for layout (Littlefield 10-1). These layouts provide each resident with a personal bathroom adjacent to their room. The case studies examined showed that it is important to provide individual bathrooms for privacy and incontinence issues. Providing an ensuite in sight of the bed allows for fewer accidents when trying to find the bathroom at night time.

6.2 Bathroom Design

The bathroom is a place that can either make a room feel like a home or like an institution. Materiality and familiar appliances will change the atmospheric qualities of the space. Features are required to assist the residents with less mobility and there must be room for staff in the bathroom. An exploration into types of sinks show which would best suit the bathroom for the programmatic purpose. The selected sink allows for ease of cleaning but also provides sufficient surface area on top for personal items.

Deteriorating eyesight is commonly linked to dementia, impairing depth perception, spatial orientation, colour perception and the understanding of contrasts. To minimise confusion for the resident higher contrasts need to be implemented. The modern white bathroom design is not functional for the person with dementia. The toilet, flush button, and handbasin all need to be highly visible for a resident with low cognitive ability and failing eyesight. These features also need to hold some semblance to historic design to trigger memory and routine.

Our most successful bathroom has bright yellow walls that really distinguish the walls from the floor and in that bathroom we have a wooden toilet seat. They can all see that toilet and the comment has been "It's like home" probably from their childhood.

- Questionnaire answers

6.3 Bathroom Visuals

Ensuring that the bedroom layout provides physical features or clues that are familiar to a person is important to the design of the room. With short term memory loss, the dementia resident is forced to rely on memory, which provides difficulties with wayfinding. Making sure the bed can be placed in multiple locations that provide a visual connection to the bathroom is important.

6.3.1 | (above) Preferred view of toilet from bed

6.3.2 | (above) Exploration into room layouts and views to bathroom

Another important aspect of designing for dementia is to ensure that people are receiving enough daylight, or can receive light therapy. The existing windows allow minimal light due to the sizing of the opening. The windows have been adapted to suit each bedroom and enhance the lighting qualities through more natural lighting in the mornings. This will also increase the external viewing space for the residents, allowing them to see more of the surroundings. The design of the windows is congruent with the style of the house and acts as a familiar feature in the room. Ways in which the windows could be adapted to enhance this natural light have been explored and tested using a lighting analysis strategy. Figure 6.4.5 shows a series of iterations that encompass modern and historic window treatments to evaluate the lighting qualities inside an eastern-facing bedroom.

6.4.1 | (above) Existing bedroom windows

6.4.2 | (above) View shafts from windows to surrounding landscape

6.4.3 | (above) Areas where additional light is needed

6.4.4 | (above) Exploration into window adaption

Current windows have low light levels, but have control over ventilation and security of windows

Similar design, larger opening allows more light in, and creates a bigger viewing port to the surrounding landscape.

Same sized opening, single pane of glass lets in more light than the framed windows; issues with ventilation.

Larger opening, single pane of glass allows light to cover the entire room; issues with ventilation.

The large window takes up the majority of the wall letting in too much light and heat, and could be a danger with lower cognitive people.

Bay window design lets in too much light, and would make the room too warm in the summer months.

Corner windows let in light which covers the entire room; the design is a radical move for a rural typology, and would mean giving each room a section sticking out of the building.

A benefit of the existing windows is also the control over how they can be opened to allow natural ventilation. The windows all currently open with hinges on the side, creating a fall risk hazard for items that can fit out the window, or the possibility of a resident trying to get out a window. Ensuring that the windows cannot be opened to such an extent will prevent such hazards. Possible alternatives have been explored to maximise the release of hot air out, and the entry of cool air in, without blocking the view of the surroundings. A combination of fixed and opening window panels will ensure the room is appropriately ventilated in all seasons.

6.6 Artificial Lighting

A new feature in leading dementia facilities is light therapy. This is produced through ceiling panels which emit blueish-white light. These are turned on in the morning to reduce agitation later in the day, and allow residents to get better sleep at night. The blue light is often used to slowly wake residents up in the morning as the dimmer automatically increases. Studies have shown that this blue light is most effective in the morning, and reduces bad behavior of a person with dementia.

Visiting a leading research team at Massey University Wellington provided a firsthand experience of the light room they created to test light therapy (fig.6.6.1). This method of controlled light has been proved to be positive for people with dementia by one of their main researchers (Gibson).

6.6.1 | (above) Massey University controlled lighting room

This option can offer freedom in the room layout while still providing the necessary lighting qualities.

6.6.2 | (above) Exploration into non-intrusive artificial lighting

6.7 Building Extension

To establish a better layout, the footprint of the building required further analysis to initiate a design move that created more space and circular wandering. The extension of the building should reflect the initial design of the existing building, while providing a unique character of its own. Various layout possibilities use the buildings proportions and floor plan to aid the design of the extension (see fig.6.7.2).

Additional space

Circular loops

Total public space

The proposed layout mirrors the existing eastern side of the building, making the building footprint symmetrical. This provides additional interior space as well as creating a new exterior area. The extension allows for a continuous loop around the central staircase and a connection across the multiple public spaces. The continuous loop track is important for people with dementia as they

deal with dead ends differently to people with full cognitive abilities. Dead ends cause confusion as to where the person was travelling and also pose difficulty for working out how to turn around. To avoid these points of confusion there needs to be a continuous loop which aids in the movement around space. A continuous loop track also facilitates sundown wandering.

A method of wayfinding has been introduced using pattern on the walls in the corridors that was derived from both nature and historic interior decor. Different patterns or colours are used to differentiate between spaces. This also creates an opportunity to hide entryways using the same pattern preventing residents from accessing rooms that are off bounds, such as staff or nursing rooms. The use of patterns from nature can create a shift in focus, enhancing concentration and reducing stress. Biophilic design addresses how visual stimulation can reduce the increased agitation in people with dementia (Terrapin Bright Green 38).

6.8.3 | (opposite) New Zealand native plants abstracted

6.8.4 | (opposite) Patterns created from overlays

6.8.5 | (above) Patterns used as wall feature

As the eyesight and posture of the residents deteriorates, the typical labeling of both rooms and other spaces becomes harder to see and recognise. There is currently a lost opportunity in the lower section of the wall to enhance way-finding around the facility. This can both reduce any institutional feeling as well as enhance the character of the abstracted wall features.

6.9 Materiality

Tiles, or any type of cold flooring are problematic. Some of our people are hypersensitive especially on the soles of their feet, and become reluctant to stand if they put their feet down and it is cold. We have a glittery shimmer in the linoleum in bathrooms in our facility. People are often afraid to step on it or put their feet down. To them it is like water.

- Questionnaire answers

Materials are an important aspect of the interior, both to make a space feel comfortable and home-like and to serve the needs of the residents and the staff of the facility. The flooring material can become quite problematic with the residents' diminished eyesight, and cognitive ability. High contrasts of materials should be avoided because residents are unable to understand contrast. They feel as though they are stepping onto something wet, or at a different level, or even into a big hole (fig. 6.9.2). This can create anxiety for the residents when moving around the facility. A continuous material that doesn't change over the entire facility can help to eliminate this uncertainty for the residents. A material that is familiar as it was commonly used in older rural buildings is wooden flooring. However, the issue with timber flooring is that it cannot be used as a wet room material. A vinyl or laminate timber look-alike flooring can cover all spaces of the facility including the bathrooms. This will also help with the problems associated with incontinence such as the retention of odours, which is experienced with carpeting.

Kauri natural timber flooring

Timber look-alike laminate flooring

6.10 Design Phase 2 Interior

6.10.1 | (above) Level 1 Plan

6.10.2 | (above) Kitchen – dining area

6.10.3 | (above) Main living area

2 The table shape has been changed to allow one person per side of the table, eliminating confusion as to which food is theirs.

An open kitchen design has been kept to promote self dependency.

Plants have been brought into the area as an aspect of therapy. They promote discussion between residents and some stimulation to the southern end of the building.

Wooden panelling provides screening to a window which is positioned between the staff room and kitchen for monitoring of residents.

3 Curtains were chosen for the comfort they provide with privacy and making the facility feel more home-like.

4 Wooden louvers control light and heating.

The reading room captures sun in the afternoons.

5 The wallpaper leaf design is situated in all public areas of the facility.

The plan of level 1 shows a clear circular path between public areas, which promotes circulation and facilitates sundown wandering.

6.10.4 | (above) Afternoon sitting area

6.10.5 | (above) Smaller living area

6.10.6 | (above) Bedroom

6.10.7 | (above) Level 2 plan

6.10.8 | (above) Bedroom views to farm landscapes

6.11 Exterior - Connecting Site

6.11.1 | (above) Exterior of Dementia facility

The surrounding buildings were previously used as a swimming pool and farm sheds. Their footprints are perfect for indoor farming activities which could engage both the residents and younger generations.

6.11.3

6.11.4

6.11.5

6.11.2 | (above) Site plan

6.11.3 | (above) Indoor swimming pool and squash court building plan

6.11.4 | (above) Semi-covered farm shed building plan

6.11.5 | (above) Large fully covered farm shed building plan

Layout of the swimming pool

Movement through the building

The indoor swimming pool provides the perfect setting for an indoor garden. This will allow residents and people visiting the site to wander around and view the plants as they change seasonally. It also provides an activity that family can participate in when visiting their loved ones. The option to leave the dementia facility and wander around the grounds will ensure that family don't feel as though they have placed their family member in a prison-like environment. This is important to both family and resident as it provides an avenue of prospect, reducing 'stress, boredom, irritation, fatigue and perceived vulnerability' (Terrapin Bright Green 44).

New layout plan 1

New layout plan 2

Modular pens hold different types of animals for people to feed and pet, most commonly farm animals.

Horse stables will provide an additional attraction to the site. They can be used for lessons, or horse treks around the site for non-residents. These animals can easily be fed by residents and community members, enforcing this human-animal relationship for former rural people with dementia.

6.12

Summary and Reflection

This section of design iterations has progressed to incorporate many of the necessary dementia-resident requirements. By considering the resident and how they would experience the building as well as the surrounding landscape, micro and macro design changes have been made to the building to eliminate confusion and enhance familiarity. Wayfinding and therapeutic design knowledge has been drawn on to make design decisions which have advanced this design stage. All aspects of bedroom and interior circulation have been analysed to produce an outcome that benefits the residents and their specific requirements. Landscape aspects of the design have been explored, but community farm attractions need further analysis and detailing.

Positives:

- The notion of allowing one to 'decorate' the space with what was familiar in their own homes/lifestyles is important.

- Familiar interior decor represents rural design.

- Community interaction occurs through farming-specific programmes.

- Detailed analysis of bedroom design has resolved issues identified in dementia research.

- The design places emphasis on view shafts to surrounding landscape and cluster of buildings.

Things to Consider:

- Explore the notions of sense of place, space, and time.

- Consider colours and finishes related to native New Zealand flora when selecting materials.

- Pay attention to macro detailing within the interiors of the facility and community attractions.

- Consider safety aspects in community buildings for residents and younger people.

- Establish clear break-out spaces within the facility. Design programme-specific spaces.

- Look into wayfinding and feature wall materials. Patterns might be seen as something to pick at.

Contextual Design

Wayfinding

Therapeutic Design

Rural Building Typology

Residential Scale

Human-Animal Companion

Rural Materials

Circulation

Community Interactions

Rural Landscape Typology

Central Communal Spaces

Connections to Nature Physically/Abstracted

Visual Connections to Farm Animals

Reference points

Sensory Stimulation

7.0

Final Design

Today is the day.

I have been starting to forget things these past few months. It seems to get worse as time goes by. My daughter has been harping on about how I need to go into a home before I can't look after myself. I'm not sure why she thinks I am incapable of performing daily tasks. I have been doing it by myself for years.

They have all moved into town, closer to jobs and schools I suppose. But being out on the farm is where I have spent most of my life. I know I'm going to miss waking up here and plodding around looking and tending to my garden. Wendy tells me this new place isn't much different from home, that they have animals and gardens and I can still look out onto the farm lands. I hope she is right. I have packed all my things. It's funny how your entire life can end up fitting into a suitcase. I'll be taking my comfy chair to sit in when I read in the sun and a few nick-nacks which I have gotten from my late husband and children. It's the small things that matter now, family and memories. The ones that are still there at least.

Dot.

So I set up all my things in my room yesterday. Wendy and her husband helped. It's comforting having my things around me. I did meet a few lovely people yesterday. Edna was brought up not far from where I lived. So we reminisced on old school memories. It was an enjoyable first day. I do miss home but I'm glad this is more like a home than the place they sent my friend Nancy. It would be lovely to have her visit sometime.

Bedroom

Light therapy from strip lighting hidden in scotia is therapeutic and reduces agitation. This design feature also avoids large ceiling tiles which aren't home-like.

Timber door provide a contrast to the wall materials, making them visible to residents.

Flexible layout allows for the resident to position the bed so that the room has a familiar layout.

Curtains provide a home-like touch.

Continuous flooring from bedroom to bathroom reduces uncertainty with colours and textiles.

A contrasting toilet seat increases the ability to find the toilet in the bathroom.

Hallway

This historic print has been enlarged to create connections to past memories. It is used in all public areas.

An elevator helps with movement between levels.

Today we had a young chap in to play the piano. He was a beautiful player. It takes me back to when I did lessons all through school. I wasn't very good, my fingers seem to fumble over the keys. met a lovely lady today, we sat next to each other while the piano was being played. Her name was Edna.

Social spaces

Scotia, commonly used in New Zealand homes, provides a contrast to both wallpaper and walls/ceiling.

Timber flooring laminate flows throughout the facility. It is a material that is easily cleaned and has less traction for people with walkers.

Personal furniture creates a home-like feeling and gives a sense of place to residents.

Room barriers such as the fireplace and bookshelves break up the large space, creating small sitting areas for clusters of people to retreat to rather than going back to their rooms.

Kitchen

An open kitchen encourages residents to freely use it or watch others using it.

Square tables ensure each person has their own side of a table. This reduces the chance of residents grabbing others' food.

Using the same pattern on staffroom and cleaning cupboard doors and walls surrounding them renders them almost invisible to residents.

Timber panels covering the window into the staffroom allow staff to monitor the public areas.

There is a spot I love to sit in the afternoon. Jim is always sitting there reading the paper. I like to sit in the corner in my chair and feel the sun through the window above. It warms my back. There is also a lovely rose bush outside. I enjoy the scent from my spot. It reminds me of when I first planted the gardens surrounding the house on the farm, Bill and I owned. I haven't seen Bill around here very much. He must be away with the animals. He showed Giesian Bulls every year. Won a few times too!!

Sitting room

The sitting room has a ceiling window to maximise afternoon light.

Timber panels reduce heat and light in summer months.

Exterior of facade

Timber panels show exterior building extension and provide shading.

Views to the surrounding community buildings visually engage residents and encourage them to wander outside.

Indoor garden

The indoor garden encourages residents to wander around the site or help with gardening. The garden invites families to go outside together.

Went for a wander to-day with Edna, such a lovely lady. Edna showed me a pretty indoor pond and garden right next door. We have decided to help with the gardening. I do miss my garden, but this one is nice too because it is indoors. Lets you keep out of the rain in winter, not that it ever bothered me. Sat on the seat for awhile and watched the ducks bobbing up and down in the water. On the way back to the house picked a delightful rose.

I thought I saw my husband today. He was out moving the cows so went out to see if it was him. It wasn't - not sure where he is. I haven't seen him for awhile. I'm sure he'll be home for dinner. Went for a wander around the rest of the property. Found Jim, he was walking the dog and we stood and watched the girls for awhile before walking back to the house.

8.0

Conclusion

Design Stage 1

Design Stage 2

Final Design

8.0.1 | (above) Design Phase 1 design imperatives

8.0.2 | (above) Design Phase 1 image

8.0.3 | (above) Design Phase 2 design imperatives

8.0.4 | (above) Design Phase 2 image

8.0.5 | (above) Final Design, design imperatives

8.0.6 | (above) Final Design image

Loss of memory and confusion are becoming a reality for people living with dementia all over New Zealand. As the rate of people with dementia is set to increase, tripling before 2050, there is a need for many more specialised facilities to accommodate them and to provide them with a reasonable quality of life. Currently in New Zealand there are limited specialised facilities designed to address the issues that people with dementia face.

As people with dementia lose their short-term memory and retreat to an earlier time period, modern technologies, newer building typologies, and even landscapes become foreign to them. To date, the focus of aged-care facilities has been on cost and the efficiency of staff, resulting in facilities that are easily cleaned and institutional. For a resident with dementia, this new environment can be confusing, even more so if the person has never lived in a higher density urban environment. With the added difficulty that people with dementia are unable to regulate environmental changes, the environment needs to respond to accommodate this group of people. With the increased numbers in rural locations, New Zealand has an opportunity to produce a dementia centre outside of the major urban

centres, drawing on contextual design, wayfinding, therapy, and how these relate to people with dementia.

Designing a space that is less institutional and draws on home-like features reduces agitation and confusion in residents. This visually congruent design aligned with the lifestyles that people from a rural community have come from can enhance the morale in residents placed in dementia care. Characteristics such as materials, sizing, typology and landscape views are features which differentiate rural design from urban design facilities. The proposed dementia centre takes the site of Flock House on the outskirts of the rural town Bulls, and brings back life to a historically influential former farming institution. The farming typology of the site allows for a wide expanse of views in all directions, and an outlook onto daily farming animals and farmer routines. The addition of this visual connection to prior lifestyles of a rural resident with dementia will provide comfort and entertainment.

Cognitive abilities of people with dementia is limited so the importance of creating an interior which sympathises with aged-care, mobility, wayfinding, and wandering

are aspects which will reduce confusion in spatial arrangements. With the input of first hand dementia knowledge through the author's visits to facilities, small details become prominent design features within the interior. Ensuring these features are delivered in a home-like fashion enhances how the residents use the space.

The addition of therapy through influential practices such as Biophilia and the 12 Steps of Eden have enhanced aspects of the design. Connections between the interior and exterior have been explored to create stimuli for the residents, and generate community interaction between site and residents. The importance of human-animal bond is highly regarded as a form of therapy, and relates to the former lifestyle of people from a rural community.

The proposed dementia centre looks at 12 design imperatives based on contextual design, wayfinding, and therapeutic design, which shape how the final design was established. As dementia limits a person's abilities, the design outcome has been shaped by this and has resulted in a fully functional healthcare facility with the design of a rural homestead. The proposed site and final design has

explored all aspects of dementia and seeks to eliminate through design all issues that can be overcome for people living with dementia.

The research did not extend into a cost analysis of the final design. As the selected site is rather derelict the costs of renovating buildings and cleaning up the landscape to a high standard could be considerable. With additional time, further analysis into materials and wayfinding aesthetics could enhance the design outcome.

9.0

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11.0

Appendix

INFORMATION SHEET:

Participant Information Sheet for a Study of Interior Design related to Dementia Care

Researcher: Sarah Cheetham, School of Architecture and Design, Victoria University of Wellington

I am a Masters student in Interior Architecture at Victoria University of Wellington. As part of this degree I am undertaking a research project leading to a thesis. The project I am undertaking is examining the difficulties Dementia patients encounter within the realm of Interior Design as the disease progresses. This research project has received approval from the Victoria University Human Ethics Committee.

I am inviting caregivers or people working in dementia facilities to participate in this study. Participants will be asked to complete a short questionnaire, outlining difficulties that Dementia patients encounter in the facilities that they work within.

It is envisaged that the questionnaire will take about half an hour to complete, may be completed in your own time and returned to me personally or via the post. Stamped addressed envelopes will be supplied.

Should any participants feel the need to withdraw from the project, they may do so without question at any time before 30 September 2015. Just let me know at the time.

Responses will form the basis of my research project and will be included in a written report on an anonymous basis. It will not be possible for you to be identified personally. Only grouped responses will be presented in this report, allowing only generalised summaries based on all answers provided. All material collected will be kept confidential. No other person besides me and my supervisor Jacqueline McIntosh will see the questionnaires. The thesis will be submitted for marking to the School of Architecture and Design, and deposited in the University Library. Questionnaires will be destroyed at end of the project.

If you have any further questions or would like to receive further information about the project, please contact me at

Sarah Cheetham
cheethsara@myvuw.ac.nz

Or my supervisor
Jacqueline McIntosh,
At the School of Architecture and Design at Victoria University
Jacqueline.mcintosh@vuw.ac.nz

CONSENT TO PARTICIPATE IN RESEARCH

Title of project: Interiority of a Disconnected Mind

This thesis topic looks into the interior aspects that Dementia patients find difficult to overcome in aged-care facilities. I have agreed to participate in completing a questionnaire to aid in the research of this thesis. I have been given and have understood an explanation of this research project. I have had an opportunity to ask questions and have them answered to my satisfaction. I understand that I may withdraw myself (or any information I have provided) from this project before 30 September 2015, without having to give reasons.

I understand that any information I provide will be kept confidential to the researcher and the supervisor of the project. I understand the published results will not use my name, and that no opinions will be attributed to me in any way that will identify me.

- I understand that I will have an opportunity to check and modify my answers on the questionnaire before I submit to the researcher.
- I understand that I can leave questions unanswered if I do not feel comfortable answering.
- I understand that the data I provide will not be used for any other purpose or released to others without my written consent.
- I would like to receive a summary of the results of the research when it is completed.
- I understand that the information I have given will be destroyed at the completion of this thesis.
- I agree to take part in this research.

Signed:

Name of participant:

Date:

Researcher:

Sarah Cheetham
cheethsara@myvuw.ac.nz
Interior Architecture Masters Student
Architecture and Design School
Victoria University of Wellington

CAREGIVERS QUESTIONNAIRE:

Name of Participant:

Dementia Care Centre:

Position within Facility:

Researcher:

Sarah Cheetham

cheethsara@myvuw.ac.nz

Interior Architecture Masters Student

Architecture and Design School

Victoria University of Wellington

Sunlight and Windows:

1. How do you find the residents react to sunlight?
2. Do you find they prefer more sunlight to less? (more/less)
3. Do residents prefer to sit in front of windows, or sit further into the room?
4. Based on the number of windows present in current environment, would you suggest more or less visual connections (windows) to the exterior? (more/less)
5. What's your biggest concern with large windows and glass doors?

Surface treatments:

1. What have you found doesn't work where flooring surfaces are concerned?
2. Are there specific surfaces that you have found the patients struggle with?
3. Do you find that surface changes from inside to inhibit outside exploration?
4. If yes, how would you broach this design flaw?
5. Do you find difficulties with surface changes in the bathroom?
6. Are there any specific colours that you have found the patients struggle with?

Personal belongings:

1. Do many of the residents bring in belongings to personalise their rooms? (yes/no)
2. Can these be moved into the common areas? (yes/no)
3. What is the most typical of objects brought from home?
4. Do the patients seem to connect or associate themselves with these items?
5. Do you find they feel less distressed when surround by things that remind them of their past? (yes/no)

Feel free to explain:

Interior:

1. What are aspects of the interior you feel work best for the patients?
2. What activities are most enjoyed by residents?
3. Does the corridor system in place work for the residents with respect to wandering? And why?
4. How often do the residents find their own way into the common areas (lounge, toilets, other)? (0-100%)
5. Do you have a resident animal? (yes/no)
6. Do you find that the residents enjoy the company of this animal? (yes/no)

Exterior:

1. How do the residents use the outdoor facilities?
2. On a scale of 1-10, how often would residents decide to venture outside? (1=Never, 10=Very Often)
3. What issues do they encounter when outside?
4. Do the residents engage in gardening? (yes/no)
5. Would they benefit from a greater connection to the outside? (yes/no)

Comments:

Do you have any thoughts, comments, ideas that you would like to share?