The Home as an Incubator for Dignity in Old Age

An Architectural Exploration for Dignified Ageing.

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ABSTRACT

The main intention of this research is to develop a method of increasing the number of residential dwellings which can enable ageing New Zealanders to age in place and experience a dignified ageing process. This is in response to an ageing population, expected to result in a quarter of New Zealanders being over 65 by the year 2030. As a higher proportion of the population will consist of ageing citizens, predominantly Baby Boomers, retaining a high quality of life into old age will become an issue of increasing importance. Attaining this high quality of life is dependent on the provision of dignity and the ability to age in place, and this thesis argues that the built environment plays a significant role in enabling dignity for those ageing. A review of relevant literature informs a theoretical framework which is utilised as the basis of social and architectural critique of the three prolific existing housing options for the elderly. Common architectural and programmatic deficiencies illustrate that in their current state, the existing housing stock and living models designed specifically for the elderly simply do not provide architectural environments conducive of enabling dignity of ageing occupants.

As the designers of the built environment, architects have the ability to shape spaces and places which can enable dignity. In response to the lack of appropriate housing environments for the ageing, this thesis proposes three alternative architectural models. These explorations consist of the proactive retrofit of

a typical 1940's State house, the proactive retrofit of a typical 1990's McMansion, and the proactive new build of a medium density cluster of dwellings. All three models implement common architectural principles and elements, advocated for within the theoretical framework, in order to explore the viability and validity of each of the proposed living models.

Overall the research suggests that the three proposed alternative architectural environments do enable dignity in old age, and could viably be incorporated into New Zealand's future social and architectural context. The architectural methods used and design decisions made are able to be applied to a large number of dwellings and have the potential to increase the number of New Zealanders who can age in place with dignity.

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Finally, to my friends who have not been shy in reminding me that there is a life beyond this thesis.

“Do not regret growing older. It is a privilege denied to many.”

- Anonymous

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INTRODUCTION

Over the forthcoming 20 years, New Zealand society will be significantly influenced by the number and composition of the over 65 portion of the population. New Zealand, like many other western countries, is experiencing a significant increase in number of the population being aged 65 and over than ever before. A significant demographic shift in the composition of this over 65 group is expected as New Zealand's Baby Boomers reach traditional retirement age. The priorities, expectations & living requirements of these Baby Boomers are expected to be greatly varied from any previous over 65 group in New Zealand's history. The financial situation of this ageing group requires consideration too, as these ageing New Zealanders will require more retirement funding as their life spans increase, in a context where Governmental financial support is expected to significantly decrease. This changing social context illustrates the salience of providing built environments which cater to the requirements of these ageing occupants.

A review of relevant literature advocates for dignity as the vital prerequisite for maintaining psychological and physiological wellbeing as one ages. A theoretical framework is developed which is used as a guideline to provide built environments conducive of dignity. This framework, primarily utilises Birnbacher's polarities of dignity, to outline the seven conditions that a built environment must consider in order for dignity of the occupant to be enabled.

A thorough review of New Zealand's existing mainstream housing stock, uses this framework as a basis of critique to illustrate that in their current forms these typologies illustrates a lack of consideration being given to the living requirements of the elderly and are expected to perform poorly in providing dignity for ageing New Zealanders. The traditional reaction to this lack of provision of elderly friendly housing in mainstream housing stock has been to build aged specific living models, such as retirements communities and care institutions. However, these models also display a plethora of architectural deficiencies when critiqued against the criteria set out in the framework, illustrating an inability of these models to provide environments conducive to enable dignity in old age.

The problem then becomes clear; current residential options, for the ageing population, all demonstrate architectural deficiencies. They are unable to provide built environments which enable occupants to age in place, or maintain dignity.

The main intention of the research is the development of three alternative architectural models in order to increase the amount and quality of residential dwellings in New Zealand which enable occupants to age in place and with dignity. This is achieved through the exploration of architectural methods which can be utilised to shape built environments to more effectively enable the retention of dignity in old age.

The first chapter of the thesis sets out the current and expected future contexts in which New Zealanders will be ageing. This section presents evidence explaining the pertinent social issues expected to have significant impacts on residential built environments in the coming years.

The second chapter reviews relevant literature which identifies the construct of human dignity in old age as an integral component to psychological and physiological wellbeing. This chapter explores how dignity of elderly members of society has changed over time and discusses the interpretation of human dignity utilised within the thesis.

The third chapter explains the influence that the built environment can have on human dignity. In this chapter the theoretical framework of the thesis is established, including architectural considerations which are required in a residential environment to enable human dignity as one undergoes the ageing process. This framework functions as the basis of critique of existing living models, as well as to inform the design decisions for the alternative architectural explorations.

Chapter four explores the three most prolific living models which ageing New Zealanders currently inhabit and are expected to continue residing in. These three living models are; purpose built age-segregated communities; private care institutions and the existing mainstream residential stock. Case studies which typify each living model are critiqued against the framework of dignity to illustrate the architectural deficiencies of these models, which

concludes that these existing models are unlikely to provide living environments which enable dignity of those ageing in the future social context.

Chapter five explores the less prolific emerging architectural models which are attempting to solve the inadequacies of the existing living options. The multitude of options exemplifies the immense scope of this topic internationally. This compilation of innovative alternative architectural models, which illustrates their strengths and deficiencies, functions to inform how to best approach the three design explorations.

Chapter Six is the culmination of the literature and observations and the utilisation of the architectural framework to inform three alternative architectural approaches. The exploration of design strategies and architectural considerations which questions current mainstream thinking is utilised to create three viable alternative architectural models. Each explores a different scenario, with the aim of enabling ageing New Zealanders to age in place, with dignity. The first exploration is the proactive retrofit of an existing state house, which subdivides the existing site and dwelling and alters the built environment to provide two dwellings. The second design exploration is the proactive retrofit of an existing 1990's McMansion house. This exploration proposes the subdivision of the existing site and dwelling and alters the built environment to provide 3 dwellings. The third Design exploration is a new build medium density cluster of 4 dwellings, on 4 sites, across the area of two typical existing

suburban sites. Each exploration applies the same architectural framework, which illustrates their applicability and their strengths and weaknesses.

Chapter Seven documents a critical reflection on the design explorations; their limitations and opportunities of these alternative models for future research. This Chapter stresses the need for a critical re-think of existing architectural approaches if New Zealand's future is to be one which provides built environments which enable New Zealanders to age in place with dignity.

SCOPE OF RESEARCH

The physical context of the research is the Northern Suburbs of Wellington, including Whitby, Papakowhai and Titahi Bay. The intention is that findings could be applied to dwelling in any suburb within New Zealand. The research focusses on pre-existing common residential typologies which can be identified in all New Zealand suburbs. Case studies have been selected which illustrate typical characteristics of the respective typologies.

CHAPTER 1:

AN AGEING & CHANGING SOCIAL CONTEXT

The social context in which New Zealanders will be ageing in the next twenty years is expected to be completely different to any time before. This changing social context is expected to significantly impact New Zealand's social, economic and political landscapes, and inevitably influence the built environments in which ageing New Zealanders will be living.

AN AGEING POPULATION

New Zealand has an ageing population [Fig 1]. In 2010, 12.6 per cent (549,900) of New Zealand's population were aged 65 and over.¹ Census projections estimate that by 2025, 25% of New Zealand's population will be aged older than 65.² By 2050, it is expected that the number of New Zealanders aged 65 and over will be 1.3483 million.³ This ageing population, which is expected to have significant social, economic and political ramifications, is a result of a demographic transition from high fertility and mortality rates, to low mortality and fertility rates.

Medical advances and improved living conditions of the 20th century are resulting in an extended longevity of human life. Life expectancies have risen from 50.4 for males and 54.0 years for females at birth in 1976,⁵ to 78.4 for males and 82.4 for females at birth 2007-2009.⁶ This unprecedented achievement of population ageing is an impressive testimony to successful economic and social progress,⁷ however there are a myriad of concerns which accompany this phenomenon. This massive quantitative increase in the number of the aged is expected to have a marked impact on New Zealand's built environment as more people live into old age and require more specialised housing. As more people than ever before in human history are expected to experience the ageing process, as well as the accompanying diminishments of capabilities, a clear understanding of the concept and process of 'Ageing' is sought in order to gain an understanding of the requirements of the people who fall within this ever growing demographic group.

THE AGEING PROCESS

“What is the creature that walks on four legs in the morning, two legs at noon and three legs in the evening?”⁸

The answer is Mankind; crawling on four legs as a Baby in the morning of their life, walking on two legs as an adult in the middle of their life, and finally in old age, the

Figure 1: Projected Age distribution of New Zealand population between 2004 and 2051⁴

evening of their life, with a cane as a third leg.⁹ This riddle succinctly demonstrates the typical life cycle of humans, and describes senescence¹⁰ as the inevitable human condition.

The phenomenon of this degenerative ageing process is universal,¹¹ and irrespective of gender, creed or race; it is a governing principal to which all human life adheres. Defined as a period of decline in physiological and psychological health; the ageing process is synonymous with diminishing mobility and action radius.¹² Significant areas of impairment accompanying the ageing process are the diminishment of optical, motor, and cognitive functions,¹³ such as hearing and sight;¹⁴ as well as a decrease in anatomical size, strength and coordination. Because incidence of disability¹⁵ increases with advancing age¹⁶ the ageing process is often perceived as disabling.¹⁷ Myerson believes that this ageing process can be disorientating and the transition into older life is full of disruptive and dislocating transitions.¹⁸ The complicated biological and social phenomenon known as ageing, is expected to significantly impact an ever growing proportion of New Zealand's population. Those New Zealanders progressing past the age of 65 over the next 20 years are expected to undergo this ageing process within a completely re-defined social context compared to those who have come before.

CHANGING COMPOSITION OF THE OVER 65'S: FROM SILENT'S TO BOOMERS

The social context of New Zealand is shaped significantly by the size, tendencies and expectations of its ageing population; therefore the fact that the composition of the over 65 portion of the population is beginning to change considerably is of significance to the housing future of New Zealand. In 2013, the elderly population (65+) of New Zealand primarily consists of citizens categorised by demographers as the "Silent Generation."¹⁹ These citizens are aged between 67 and 87 in 2013. Over the forthcoming 20 years, the composition of this over 65 portion of the population will change considerably to become comprised primarily of citizens belonging to the cohort demographers refer to as the "Baby Boomer" generation, born between 1945-1964 who began turning 65 in 2011.

This change in composition of the over 65 portion of the population is expected to have a significant influence on built environments as the requirements and expectations of the future elderly cohort of "Baby Boomers" is expected to differ considerably from the requirements and expectations of the existing "Silent" elderly cohort. These variations in different requirements are a result of completely different upbringings, priorities and lifestyles of the two generations. Understanding these differences provides insight into why homes for the elderly are as they are today, whilst providing the most accurate prediction of what the next ageing generation will require and expect as they age.

THE SILENT GENERATION

This cohort was born between 1926 and 1945 into a world experiencing the dire effects of the Great Depression and World War One, and they lived through the Second World War.²⁰ The consequent difficult living conditions led to an authoritarian upbringing.²¹ These living conditions during early developmental years are credited with the development of their distinctive characteristics which include an often grave and fatalistic outlook, with deep seeded expectations of disappointment.²² Conformity was a common goal, with it being "neither desirable nor practical to do things that are different from what the next fellow is doing."²³ For this generation the years between the ages of 30 to 65 were typically quiescent- a time to work diligently to prepare for retirement as a reward, filled with leisure activities and hobbies,²⁴ in which to anticipate and enjoy grandchildren.²⁵ Characteristics specific to this generation include intentional passivity, tendencies of trusting institutions and the aspiration for conformity. It is my assertion that these shared tendencies of many in this cohort can explain the proliferation and popularity of the cookie cutter, purpose built elderly communities and institutions which are scattered throughout western societies, including New Zealand [Figs 2 & 3]. These architectural models illustrate a 'one approach fits all,' which has been utilised in providing accommodation options for the existing cohort of ageing New Zealanders. These same communities and institutions are being presented as the living options to the forthcoming

ageing Baby Boomer generation. However as Buhler states, “the old people of today are not the old people of tomorrow,”²⁶ and the subsequent section explores reasons why these architectural models may not be the most appropriate in catering to New Zealand’s future elderly cohort of Baby Boomers.

THE NEW ZEALAND “BABY BOOMER” GENERATION

The libido of returning young male servicemen combined with the collective economic prosperity that followed World War Two is often cited as the catalyst for the Baby Boomer of the twentieth century.²⁷ As Western economies flourished throughout the 1950’s, having children, which had long been delayed initially due to the Great Depression, and later by the

World War Two was delayed no longer.²⁸ As wages increased, potential parents were convinced they could afford to raise multiple children,²⁹ woman married and had their first babies at a much earlier age than any other time in modern history,³⁰ and as children became more affordable, they became expected.³¹ Having children became a display of status; the idea of not having children was unconceivable to most. Not wanting children was “almost evidence of a physical or mental deficiency.”³²

The “Baby Boomer” became an international demographic disturbance which resulted in 1.125 million babies being born in New Zealand³³ between 1946 and 1965. This was considerably more than the 634,000 babies born into the “Silent generation” in the preceding 20 year period. This fertility splurge³⁴ halted only in the mid 1960’s as a result of the widespread introduction of the contraceptive pill. At the onset of this “Boomer” at the start of 1945, New Zealand’s population was 1.7 million; and by 1966 it had risen to 2.7 million.³⁵ In 1970, citizens belonging to the Baby Boomer generation represented 49.1% of New Zealand; which was a higher proportion than the Baby Boomers of Australia and the United States.³⁶

New Zealand rapidly became one of the wealthiest per capita nations in the world³⁷ as the Baby Boomers were growing up. This universal affluence meant that irrespective of family background the majority of Baby Boomer children were raised with an imbued “expectation of nearly limitless growth and opportunity,”³⁸ and the parents of the Baby Boomers strove to

Figure 2 & 3: Promotional brochures for active retirement communities which emerged in the 1960’s. The concept of moving to a holiday location to retire has been a popular amongst the Silent Generation’s retirees.

provide their children with everything they had to do without.³⁹ At no other time in history had there been such a large group of people raised in such prosperous social and economic conditions. It is in these formative years where experiences were shared which had "common and lasting effects on the values and lifestyle decisions" ⁴⁰ of the Baby Boomers which are noticeably varied from preceding generations. Consequently, the life of the typical Baby Boomer has been anything but conventional. Those belonging to this "Lucky Generation,"⁴¹ have been granted free tertiary education, free health care as well as affordable housing.⁴² As a result, this generation is said to consist of better educated individuals who concentrated on their careers more⁴³ and married and had children later than any preceding generation.⁴⁴ The liberal lifestyle which was demanded by the Baby Boomers enabled them to challenge authority and question the status quo which lead to a distrust of institutions and leaders. Personal experiences replaced indoctrinated traditional beliefs⁴⁵ and emphasis was placed on personal fulfilment.⁴⁶ The development of the individual became paramount, and the years between 25 and 65 were consumed by the uncertainties of establishing one's own personal values and sense of identity, distinct from others and from their parents. As a result, the frame of reference through which many Baby Boomers view the world differs immensely from the view of their parents. These distinct tendencies and perceptions have had significant effects on western societies, and the Baby Boomers

are credited with transforming society at each of their life stages.⁴⁷

These distinct characteristics of this group must be acknowledged by those who will play a role in shaping the future of New Zealand's built environments. Buckland warns that if planners, social agencies, and Governments fail to understand and plan for the requirements of the New Zealand Baby Boomers as they age, New Zealand's future built environment will be one of "prefabricated rest homes and cemeteries."⁴⁸ This ageing generation is expected to be completely different to any preceding cohort; therefore predicting how they will act in their senior years based on prior or current elderly cohorts is likely to be an ineffective approach.

It is important to understand that ageing Baby Boomers are expected and expecting to redefine the process of ageing. Understanding their requirements as they age is a vital step to shaping built environments which cater to this portion of the population, and enable them to maintain dignity and a high quality of life through the ageing process.

AGEING BABY BOOMERS

“Boomers come from an entirely different body of experiences compared to the Silents. They will not be like any senior the world has known.”⁴⁹

Within contemporary New Zealand society, 65 is the age that one becomes eligible for the superannuation and is therefore generally accepted by most academics, policy makers,⁵⁰ and the public as the marker of old age. However the origins of this marker for old age are in fact rather arbitrary. It was selected by the Chancellor of the German Empire; Otto Von Bismarck in the 1880's when the average life expectancy in Europe was only 45 years.⁵¹ It was decided that 65 would be the age at which people would be “considered too enfeebled to work and therefore eligible for state support and entitlement.”⁵² When the retirement age of 65 was introduced in America, 65 was the average age of death.⁵³ However in contemporary societies, with improved health and extended life spans, this 130 year old estimate of old age is deemed an outdated and inappropriate gauge for determining eligibility for old age benefits.⁵⁴ If a similar estimate were to be crafted using contemporary life expectancies, old age entitlements would be given to people at 97.⁵⁵ Chronological age is becoming a relatively inconsequential⁵⁶ classification system and an ineffective segregation tool⁵⁷ in contemporary societies. As a result being “old” today has become a more subjective concept, and the definition of “old age” is now an ever changing concept with completely different

definitions and implications than previous generations and societies. Within contemporary societies which, like New Zealand, are experiencing an ageing population, there is only one certainty; there will be more people than ever in human history living past 65, and undergoing the ageing process in the coming 20 years.

For those Baby Boomers entering traditional “old age” in the next 20 years, the inevitable health decline, disabilities and frailty associated with ageing is expected to occur much later in life compared to the preceding generations of elderly.⁵⁸ Despite this they will not escape chronic illness and other ravages of old age.⁵⁹ New Zealand's older people are expected to be older for longer,⁶⁰ with more expected to enter their eighties and nineties.⁶¹ The quantitative increase in the numbers of 65+ citizens combined with the expectation of these people being older for longer, results in the expected growth in disability prevalence⁶² and impaired mobility⁶³ rates within New Zealand's population.

THE FEAR OF AGEING

For New Zealand's ageing Baby Boomer generation “old age” tends to be aligned with the degenerative notion of the ageing process, where emphasis is placed on the negative aspects of ageing whilst ignoring any positive.⁶⁴ There is a sense of vulnerability and fear of becoming less than oneself in the latter stage of life.⁶⁵ Many ageing Baby Boomers approaching the socially accepted old age marker of 65, perceive ageing as

a disabling time, characterised by the “inevitable economic and social isolation from the rest of the community,”⁶⁶ in which the older person is placed on the margins of society.⁶⁷ For Baby Boomers, progressing chronological age continues to invoke negative connotations and although the experience and wisdom associated with old age is valued, it is youth which is fetishised.⁶⁸ This anxiety of ageing is exemplified by the concept of *Torchlusspanik*. With no direct English translation, this German word literally means ‘Gate Closing Panic.’ This is the realisation that opportunities, be they professional, economic or reproductive, are diminishing irretrievably which conjures up a quiet terror of ageing.⁶⁹ This fear of ageing is rooted in the grim awareness that life can end badly, and in undergoing the ageing process, one stands to lose all that has been achieved over a lifetime.⁷⁰ This fear of becoming old can explain why old age seems to have been split into two sub-stages; “*young-old*” and “*old-old*.”⁷¹ New Zealand Baby Boomers intend to age significantly differently to their parents,⁷² who they perceive as belonging to the sub stage of ageing of “*Old-old*,” those frail and infirm citizens who require assistance with daily living;⁷³ who conform to the traditional preconceptions of what the latter stages of life has in store. Baby Boomers however believe themselves to be “young, free, and in charge.”⁷⁴ This group has repeatedly distanced themselves from what previous generations considered customary and conventional, and old age is set to be no exception. This group hold an “unwavering determination to not get old,”⁷⁵ with old age always starting five years in the future.⁷⁶ Baby Boomers of

New Zealand will likely enter the second sub-stage of “young-old,” intending to prolong the prime of their youth and middle age⁷⁷ by becoming active and healthy seniors,⁷⁸ These “young-old” Baby Boomers are expected to re-frame old age as a time for self-discovery, new direction and fresh beginnings,⁷⁹ completely challenging the archetypal view of old age and redefining societies expectations of our older members to ensure they remain relevant in society. Smith and Clurman believe a defining characteristic of the Boomer sensibility is their aspiration for youthfulness,⁸⁰ and that Boomers don’t intend to age; but want to be ageless.⁸¹ Those with this perception of themselves as ageless pursue an identity which maintains continuity despite the physical and social changes that come with old age.⁸² Haber believes that as this cohort age chronologically, they are unlikely to perceive themselves as old, much less frail, disadvantaged, or dependent.⁸³ Retreating from society in their sixth, seventh or eighth decade will not be particularly desirable⁸⁴ for this cohort who are likely to do everything in their power to ensure they are able to live a healthy, active and youthful old age.⁸⁵ Ken Dychtwald believes that the Baby Boomers internationally are “set to revolutionize the social institutions pertaining to life’s second half.”⁸⁶ It is these tendencies of this cohort and their expectations of old age which indicate that this group of ageing New Zealanders may significantly impact the requirements of built environments and housing options for the aged. Rosenfeld and Chapman believe that as this cohort enters the senior-housing market, their distinctive attitudes toward ageing in comparison to their predecessors will have enormous impacts on home design.⁸⁷

HOUSING REQUIREMENTS OF FUTURE AGEING NEW ZEALANDERS

It is difficult to determine the exact housing requirements of each ageing Baby Boomer in New Zealand, and it would be dangerous to suggest that a single architectural model could cater to the distinctive and ever changing requirements of every ageing individual. However tendencies and characteristics can function as indicators to the housing requirements.

A large proportion of ageing Baby Boomers in New Zealand have reached the top of the housing ladder and have no 'concrete' reason to move.⁸⁸ As a result, they are expected only to consider moving if they find an even better dwelling.⁸⁹ Nyren believes that for ageing Baby Boomers the idea of "*retirement housing*," is being replaced by *next-stage* housing,⁹⁰ a sentiment echoed by Schriener and Kephart who state that ageing Baby Boomers are "determined to design better places to live out the next stage of their lives."⁹¹ This means that they are expected to be the first generation of elderly who perceive the purchase of a home after the age of 60 as an upgrade.⁹²

38% of New Zealand's Baby Boomers are currently living in an "empty nest"⁹³ and admit to not needing as much room as they once did.⁹⁴ This number is expected to increase as more of the Boomer's children leave home. The result of this is many ageing New Zealanders will be looking to downsize from their large family home. In contrast to their parents before them, many of whom packed up and moved

to active retirement communities in various vacation type locations [Figs 2 & 3], Baby Boomers are unlikely to depart the communities where their children and friends are, resulting in those ageing New Zealanders who downsize their larger homes wanting to remain in the same community.⁹⁵

AGEING ECONOMICS

As with most decisions, one's financial situation plays a significant role in enabling people's lifestyle desires, and currently, whether or not these ageing Boomers can afford the lifestyle they expect is uncertain as a result of a plethora of financial issues.

The financial situations of the future ageing cohort is a significant issue for New Zealand's future as an individual's financial situation can have a massive impact on the condition of the built environment in which one resides. Traditionally, the elderly live on relatively meagre incomes, as the opportunities to earn money diminish with their capabilities. The current elderly, the "Silent Generation," are good with saving money⁹⁶ as they came from scarcity and have made all efforts to be self-sufficient⁹⁷ as they age.

However because more New Zealanders Baby Boomers are expected to enter old age single, divorced, or having never been married, there will be an expected increase⁹⁸ in the number of low income ageing New Zealanders in fragile financial situations than has traditionally been the case.⁹⁹ As Baby Boomers have

significantly longer life spans, they are expected to require considerably more capital wealth than ever before to support themselves through the ageing process. As a result significant focus is turning to the social welfare system which is perceived by many as the saviour for the ageing Baby Boomers dwindling retirement funds. This superannuation was only ever meant to provide a few years of retirement income¹⁰⁰ and was never intended to be more than a supplement to one's own personal saving, and private retirement investments.¹⁰¹ As the Baby Boomers begin to retire from the work force at 65, the ratio of workers to beneficiaries will shift significantly.¹⁰² As this considerable proportion of New Zealand's population move from contributors to costs, the superannuation system will be supporting more people, and for considerably longer periods. New Zealand's future is one with a burgeoning demand and increasing dependence on superannuation,¹⁰³ however, it is expected that this social welfare system will not be viable by 2050. In 2009, \$21.9 billion was spent on Superannuation and health costing the average taxpayer \$9,400. However as the working age population (25 to 64) is only expected to increase from 2.268 million to a projected 2.612 million, but the cost of superannuation and health is expected to rise to \$166.2 billion in 2050; the cost to the average taxpayer is projected to be \$63,600.¹⁰⁴ If in fact this government welfare system proves to be un-sustainable and unable to cater to the demand, there is a very real potential of the "demise of welfarism,"¹⁰⁵ where "old age poverty becomes again the order of the day."¹⁰⁶ Because the

"prevention of old age poverty has seemed an indispensable ingredient for late life dignity,"¹⁰⁷ it is in the best interests of the country to ensure this does not happen.

It is expected that the cohort of New Zealanders entering old age in the coming 20 years will be ageing in a completely re defined social context. The tendencies of the cohort of ageing New Zealander Baby Boomers and their approach to the ageing process is expected to be completely untraditional. Extending life spans and increased financial pressure is expected to have a marked impact of requirements of the built environment in catering to the requirements of New Zealand's ageing Baby Boomers. The following chapter looks at how the concept of human dignity is vital throughout the ageing process to ensure both psychological and physiological wellbeing.

(Endnotes)

- 1 (Gaynor, We're not ready for Baby Boomer blowout, 2010)
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- 4 (Statistics New Zealand, Demographic Aspects of New Zealand's Ageing Population, 2006, p. 6)
- 5 (Statistics New Zealand, A History of Survival in New Zealand, 2006, p. 37) Life spans are calculated from birth.
- 6 (Ministry of Social Development, 2010, p. 26)
- 7 (Davey J. , Housing for Ageing New Zealanders, 2008, p. 43)
- 8 The riddle posed to Oedipus by the Sphinx for entry into the city of Thebes- from Greek Mythology.
- 9 (Moody, 1998, p. 13)
- 10 (Harman, 1981, p. 7124) Senescence is the defined as "progressive accumulation of changes with time, associated with the ever increasing susceptibility to disease and death accompanying advancing age,"
- 11 (Harman, 1981, p. 7124)
- 12 (Smets, 2009, p. 270)
- 13 (Herwig, 2008, p. 23)
- 14 (Davey, Joux, Nana, & Arcus, 2004, p. 141)
- 15 A disability is defined as "any restriction or lack of ability to perform an activity in the manner or within the range considered normal for a human being." (Weitz, 1996, p. 155)
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 31 (Greenblatt, 2007, p. 874).
 32 (Light, 1988, p. 24)
 33 (Statistics New Zealand, New Zealand Now: Baby Boomers, 1995)
 34 (Light, 1988, p. 23)
 35 (Statistics New Zealand, New Zealand Now: Baby Boomers, 1995)
 36 (Gaynor, Housing Downturn a Problem of Ageing, 2008) "In 1970, before any Baby Boomer had reached 25, the percentage of the population under 25 years of age was a phenomenal 49.1 per cent. In the same year the under-25 age group represented 46.3 per cent of Australia's population and 45.6 per cent in the United States."
 37 (Jenkins, 2006, pp. episode 4, Hollywood and back)
 38 (Stewart & Torges, 2006, p. 31)
 39 (Schriener & Kephart, 2010, p. 4)
 40 (Hughes & O'Rand, 2004).
 41 (Barton, 2004)
 42 (Barton, 2004)
 43 (Schriener & Kephart, 2010, p. 7)
 44 (Schriener & Kephart, 2010, p. 7)
 45 (Roof, 1999)
 46 (Roof, 1999)
 47 (Dychtwald, Age Power; How the 21st Century Will be Ruled by the New Old, 1999, p. 58)
 48 (Buckland, 2009, p. 76)
 49 (Schriener & Kephart, 2010, p. 6)
 50 (Greenbrook, 2005, p. 8)
 51 (Dychtwald, Ageless Ageing: The Next Era of Retirement, 2005, p. 16)
 52 (Dychtwald, Ageless Ageing: The Next Era of Retirement, 2005, p. 16)
 53 (Hubbard, 2012)
 54 (Dychtwald, Ageless Ageing: The Next Era of Retirement, 2005)
 55 (Dychtwald, Ageless Ageing: The Next Era of Retirement, 2005, p. 16)
 56 (Schriener & Kephart, 2010, p. 8)
 57 (Herwig, 2008, p. 21)
 58 (Buckland, 2009)
 59 (Wheelwright, 2012, p. 46)
 60 (Saville-Smith, James, Warren, & Coleman, July 2009, p. 4)
 61 (Saville-Smith, James, Warren, & Coleman, July 2009, p. i)
 62 (Rashbrooke, 2009, p. 10) "By 2039 it is estimated that 355,400 people aged 65 or over will report having a disability, an increase of 59% compared to the 146,300 over 65 reporting a disability in 2009."
 63 (Saville-Smith, James, Warren, & Coleman, July 2009, p. 4)
 64 (Cohen, 2005, p. xiii)
 65 (Moody, 1998, p. 14)
 66 (OECD, 2003, p. 173)
 67 (Grant B. C., 2006, p. 102)
 68 (Hume, 2011)
 69 (Hume, 2011, p. 19)

70 (Moody, 1998, pp. 13-14)
 71 (Herwig, 2008)
 72 (Buckland, 2009)
 73 (Stuart, 1998)
 74 (Dychtwald, Age Power; How the 21st Century Will be Ruled by the New Old, 1999, p. 63)
 75 (Smith & Clurman, 2007, p. 24).
 76 (Buhler, 2008, p. 62)
 77 (Dychtwald, Ageless Ageing: The Next Era of Retirement, 2005, p. 16)
 78 (Stuart, 1998)
 79 (Morrison, Erickson, & Dychtwald, March, 2006, p. 1)
 80 (Smith & Clurman, 2007)
 81 (Smith & Clurman, 2007, p. Xiii).
 82 (Kaufman, 1986, p. 7)
 83 (Haber, 2009, p. 285)
 84 (Schriener & Kephart, 2010, p. 7)
 85 (Smith & Clurman, 2007, p. 28).
 86 (Dychtwald, Age Power; How the 21st Century Will be Ruled by the New Old, 1999, p. 58)
 87 (Rosenfeld & Chapman, 2008, p. 18)
 88 (Smets, 2009, p. 270)
 89 (Smets A., 2000)
 90 (Nyren, 2006)
 91 (Schriener & Kephart, 2010, p. 10)
 92 (Rosenfeld & Chapman, 2008, pp. 18-19)
 93 The term empty nest is used to describe a household in which the children which once lived there have moved out, leaving only the parents living in the home.
 94 (Buckland, 2009, p. 73)
 95 (Rosenfeld & Chapman, 2008, p. 18)
 96 (Schriener & Kephart, 2010, p. 18)
 97 (Barton, 2004)
 98 The number of low income New Zealanders aged 65 and over is expected to increase 73,200 to 130,000 between 2001-2021 (Davey, Joux, Nana, & Arcus, 2004, p. 121)
 99 (Hughes & O'Rand, 2004, p. 19)
 100 (Vernon, 2004, p. 20)
 101 (Gusmano, 2011, p. 44)
 102 (Gaynor, We're not ready for Baby Boomer blowout, 2010)
 103 (Hickey, 2011)
 104 (Gaynor, We're not ready for Baby Boomer blowout, 2010)
 105 (Grant B. C., 2006, p. 100)
 106 (Herwig, 2008, p. 33)
 107 (Moody, 1998, p. 21)

CHAPTER 2:

HUMAN DIGNITY AND AGEING:

NEW ZEALAND SOCIETY'S PERCEPTION OF THE ELDERLY.

Society's perception of the elderly plays a significant role in determining the quality of life that older people can lead.

The perception of the elderly in contemporary New Zealand society has been greatly influenced by other western cultures since the early 19th Century. For most of human existence the elderly of most cultures were revered and respected. Reaching *old age*¹ was held in extremely high regard; elders controlled power, assumed leadership, and set examples for others.² Elderly members of society were cared for by close family or the close community, as the society imbued a sense of worth to the elderly, which enabled them to age with dignity as they became frail.

This perception changed in the 19th and 20th centuries as the paradigm shift accompanying the Industrial Revolution altered societal perceptions toward the aged members of society significantly. This industrial era introduced entirely new sets

of priorities, and in this constantly changing and rapidly paced industrial world, implementation of new industrial technology was paramount. The wisdom, experience and stability of old offered no useful advantage over the enthusiasm, energy, mobility and raw strength of the young.³ The jobs were afforded to the young, who readily accepted change; as older workers were seen as less productive. In 1905, Dr. William Osler, argued that men older than 40 were useless cogs in a modern society; pronouncing that "all of the great advances have come from men under 40."⁴ This shift in perception eroded the status and privilege previously enjoyed by the elderly as property owners and family heads. This was the first time in human history that the knowledge of, and commitments to, the old ways of doing things became viewed as a distinct disadvantage.⁵ The aged portion of the population came to be viewed as social burdens and obstacles to progress.⁶ This decline in social status of the elderly led to an overarching societal perception of *Gerontophobia*; characterised by a hostility towards the elderly and a fear of ageing. By the 1920's the perception of the elderly within society had been completely transposed, with "increasing discrimination against older men and woman in employment and in the community at large."⁷ This overarching attitude subjugated the elderly as weaker, sicker and therefore less important members of society, focussing on the diminishment of capabilities and loss of status that the elderly experienced during this time. As a result, elderly became heavily dependent on family for support. However

the rapid urbanisation occurring at the time meant any tradition of family support for elders was dislodged, exposing increasing numbers of older people to the threat of poverty and loneliness,⁸ and the impoverishment of the ageing process.⁹

As so few elderly could support themselves, or be supported by family, many were forced into Government funded Workhouses [Figs 4 @ 5]. The primary function of the Workhouse was to house and feed the unemployed, poor and infirm. These Workhouses quite quickly became disproportionately populated by growing legions of impoverished elderly evolving into “residential homes for frail older people,”¹⁰ housing those suffering from “the miseries, weaknesses, and imbecility of old age”¹¹ [Figs 6 & 7].

These places were purposely designed in such an austere manner so as to attract only those with nowhere else to go,¹² and eventually became conceived as mere “horrible warehouses for the aged, the infirm, and the dying.”¹³ Accounts reveal that within these environments the “elderly and infirm sat around in the day-rooms or sick-wards with little opportunity for visitors”¹⁴ [Fig 8]. From the 1850’s until 1950’s entering the Workhouses harsh regime and severe conditions was considered the ultimate degradation and humiliation.

These workhouses are the first example of built environments endorsing societal perceptions of the elderly and are also the architectural predecessor to residential care environments found in New Zealand today.

Figures 4 & 5: Sampson Kempthorne's workhouse design for 300 paupers

Figure 6 & 7: Segregated meals for large numbers of both men & woman within a Workhouse in Victorian Britain.

Figure 8: Hubert von Herkomer's painting; *Eventide: A Scene in the Westminster Union*; illustrates the common perception of life within the walls of a Workhouse in Victorian Britain.

As the burden of caring for poverty stricken elderly continued to fall on governments, many followed the lead of Germany, and introduced a "basic level of support for the elderly,"¹⁵ in the form of the pension. This pension softened the blow of depression and personal misfortune,¹⁶ and removed the elderly from competing for jobs with the young; restoring intergenerational financial security¹⁷ by enabling independence for the elderly. The existence of this established pension system enabled the conception of retirement, a social institution which has played a vital part in re-instating the elderly as a group deserved of respect and dignity.

RETIREMENT

The concept of retirement, as it is understood today, finds its roots in the Industrial era. Long workweeks consisting of repetitious and physically demanding¹⁸ work resulted in unhappiness and stress emerging as a common workplace issue.¹⁹ These work conditions saw retirement programs emerge as workforce management tools with the intention of enabling "older workers to retire with dignity to make room for more productive, younger workers."²⁰ Retirement was seen as the promise of reward for those working for decades in demanding and often unfulfilling labour.²¹

The concept of retirement has since evolved from a mere workforce management tool, to an institution in its own rite.

Retirement is today conceived as a relaxing, permanent holiday, often referred to as the Golden Years. These perceptions have been shaped by the marketing techniques of financial institutions in the 1960's and 1970's which encouraged people to save and invest for their retirement years [Fig 9 & 10].

The widespread social acceptance of this marketing is responsible for transforming the concept of retirement "from a few years awaiting death with dignity, to an extended period where one could finally have the fun deserved after a lifetime of hard work."²² In contemporary western societies retirement is now perceived as "an entitlement"²³ with

a lengthy retirement seen as the "inevitable culmination of life."²⁴ Retirement as the Golden years is a 20th century phenomenon,²⁵ and due to the acceptance of this social institution, old age has been re-branded as being "accompanied by new opportunities, challenges, and lifelong learning."²⁶ In a 21st century context, the role of retirement is expected to be re-defined by the changing ageing demographic and focus will be placed on the ability of the elderly to age with dignity.

AGEING WITH DIGNITY

Society's perception of the elderly has had and will continue to have significant impacts on the quality of life and physiological and psychological wellbeing of ageing New Zealanders. With higher numbers of elderly people living much longer than ever before, the quality of life and wellbeing of ageing New Zealanders is becoming more pertinent and emphasis is being placed on ensuring a high quality of life for elderly members in society. The World Health Organisation has stressed the need to "optimise opportunities for health, participation and security in order to enhance quality of life as people age."²⁷ The New Zealand Government published the *Positive Ageing Strategy* which attempts to "dismantle the perception that old age is mostly about dependency and decline."²⁸ In this paper, emphasis is placed on the later years as a time to celebrate the richness and diversity of the ageing experience²⁹ as a complex, open-

Figures 9 & 10: Advertising material, typical of the 1960's, used to successfully market Retirement as the Golden Years - a time for travel and self discovery.

ended, subjective and socio-cultural experience.³⁰ This paper acknowledges the significant place of older people in society and emphasises the need for the creation of a society where age becomes irrelevant societal treatment.³¹ This would encourage high quality of life for ageing citizens.

As this significant demographic shift of an ageing population approaches, Governments, social institutions, private developers and policy makers are realising the value of ensuring the aged portion of the population experience a high quality of life. A review of relevant literature uncovers that many significant documents cite "dignity" as the main component necessary in maximising both psychological and physiological wellbeing in old age. In 1991, *The United Nations Principles for Older Persons*,³² were published, citing dignity as a significant principle for wellbeing, stating that older persons should be able to live in dignity³³ and die with dignity.³⁴ In 2001, New Zealand's Ministry of Social Policy, released the *New Zealand Positive Ageing Strategy* which recognizes the significance of providing those citizens in their senior years the right to be afforded dignity.³⁵ In 2002, The World Health Organisation released the paper *Active Ageing: A Policy Framework*. One of the prevailing and overarching themes this framework advocates for the ageing population is that they are afforded dignity.³⁶

The shared overarching message of these influential texts is that those ageing should be considered valued members of society who have the right to be afforded dignity in their senior years.³⁷

Although these texts discuss the significance of affording the elderly dignity and acknowledge dignity as a fundamental prerequisite to wellbeing and sense of meaning,³⁸ it seems there is not an absolute definition of dignity provided by any of the literature. I speculate this is because dignity is a rather ambiguous and culturally relative concept and the subjective nature of dignity makes this social construct difficult to quantify. For this thesis it is important to define and quantify the concept of dignity so that it can be understood and applied architecturally.

Etymologically, dignity stems from the traditional Roman idea of *dignitas hominis*; which refers to status.³⁹ To *Hailer & Ritschi*, dignity is not inherent in human beings; it is assigned by others through means of communication and action.⁴⁰

In Harry Moody's article; *Why Dignity in Old Age Matters*; he refers to dignity as a term of moral appraisal, which can be used to measure the conduct of oneself and of others.⁴¹ In his opinion when dignity is afforded to an individual, barriers and prejudices are removed.⁴²

Dieter Birnbacher proposes that human dignity can be best understood as a family of meanings⁴³ which are most effectively understood through exploring the relationships of polarities [Fig 11]. The terms in the left hand column illustrate qualities inherent to enabling and promoting dignity. In contrast, the right hand side illustrates the qualities which disable and stifle human dignity. I interpret this not as a list of determinants of human dignity, but rather as a spectrum of dignity in which one can locate oneself.

These polarities define the peripheries of a set of certain human conditions. These conditions- self-worth, solitude, capacity, social power, individuality, health, and ownership are the conditions which I propose are the significant determinants of human dignity. I propose that these seven conditions can function as a framework for enabling dignity in old age. I also propose that each of these conditions can be significantly impacted by the built environment and that the built environment in which one will undergo the ageing process can have a marked impact on dignity in old age. The following chapter explores these conditions of dignity through an architectural lens to determine the certain architectural considerations and requirements of each of these conditions.

Self-Respect	vs.	Shame
Honor	vs.	Humiliation
Decorum	vs.	Inappropriate Behavior
Privacy	vs.	Exposure
Power	vs.	Vulnerability
Equality	vs.	Favoritism
Adulthood	vs.	Infantilization
Ego Integrity	vs.	Despair
Individuation	vs.	Objectification
Autonomy	vs.	Dependency

Figures 11: Birnbacher's Polarities of Dignity

(Endnotes)

- 1 Old age- a relative measure dependent on the culture and average lifespan.
- 2 (Dychtwald, Age Power; How the 21st Century Will be Ruled by the New Old, 1999, p. 6).
- 3 (Dychtwald, Age Power; How the 21st Century Will be Ruled by the New Old, 1999, p. 10).
- 4 (Osler, 1905).
- 5 (Dychtwald, Age Power; How the 21st Century Will be Ruled by the New Old, 1999, p. 11).
- 6 (Dychtwald, Age Power; How the 21st Century Will be Ruled by the New Old, 1999)
- 7 (Dychtwald, Age Power; How the 21st Century Will be Ruled by the New Old, 1999, p. 14)
- 8 (Dychtwald, Age Power; How the 21st Century Will be Ruled by the New Old, 1999, p. 14)
- 9 (Haber, 2009, p. 284)
- 10 (Kiata-Holland, 2010, p. 23)
- 11 (Trollope, 1882, p. 4)
- 12 (Timonen & Doyle, 2008, p. 78)
- 13 (Dychtwald, Age Power; How the 21st Century Will be Ruled by the New Old, 1999, p. 14)
- 14 (Higginbotham)
- 15 (Dychtwald, Age Power; How the 21st Century Will be Ruled by the New Old, 1999, p. 15)
- 16 (Time, People: The Younger Generation, 1951)
- 17 (Dychtwald, Age Power; How the 21st Century Will be Ruled by the New Old, 1999, p. 15)
- 18 (Vernon, 2004, p. 19)
- 19 (Vernon, 2004, p. 19)
- 20 (Vernon, 2004, p. 20)
- 21 (Smith & Clurman, 2007)
- 22 (Vernon, 2004, p. 22)
- 23 (Vernon, 2004, p. 22)
- 24 (Vernon, 2004, p. 22)
- 25 (Wheelwright, 2012, p. 48)
- 26 (Herwig, 2008, p. 21)
- 27 (World Health Organization, 2002, p. 12)
- 28 (Grant B. C., 2006, p. 102)
- 29 (Grant B. C., 2006, p. 102)
- 30 (Grant B. C., 2006, p. 102)
- 31 (Dalziel, 2001, p. 9) *Towards a Society for all Ages*
- 32 (Nusberg, June 1991, p. 6)
- 33 (Nusberg, June 1991, p. 5)
- 34 (Nusberg, June 1991, p. 6)
- 35 (Dalziel, 2001, p. 6)
- 36 (World Health Organization, 2002, pp. 13, 21, 22, 37, 45, 46,)
- 37 (Dalziel, 2001, p. 6)
- 38 (Moody, 1998, p. 18)
- 39 (McCrudden, 2008, p. 656)
- 40 (Hailer & Ritschl, 1996, p. 103)
- 41 (Moody, 1998, p. 14)
- 42 (Moody, 1998, p. 19)
- 43 (Moody, 1998, p. 23)

CHAPTER 3:

AGEING AND THE BUILT ENVIRONMENT. AN ARCHITECTURAL FRAMEWORK

"No activity can become excellent if the world does not provide a proper space for its exercise."¹

ARCHITECTURE & DIGNITY

"Growing old is part of human life, change is part of Ageing, Architecture must reflect these changes."²

As one undergoes the ageing process, more time is spent within residential environments.³ This increases dwelling-based activity and places increased importance on this type of built environment to cater to the requirements of the ageing inhabitant. Typically, when social, physical or mental circumstances change, the housing requirements change and one tends to need to move house in order to find a dwelling which will more appropriately suit the inhabitants changing requirements.

As Saville-Smith proclaims; "the housing future of older people is the housing future of New Zealand,"⁴ therefore it is vital that ageing New Zealanders are provided with built environments which can enable a dignified ageing process. David Denerick proposes that "architecture can help people defend dignity when they most need it."⁵ By "affirming personhood, giving users control over their environment, and providing space for personal growth,"⁶ dignity can be enabled to those who need it. He goes on to discuss that if dignity is not considered in the design process, the potential consequence is the creation of places that may injure human dignity."⁷ This thesis supports Denerick's assertion that architecture ought never intentionally compromise dignity,⁸ and proposes that built environments should in fact

enable and encourage dignity. In order for this to occur the seven conditions necessary for dignity in old age must be present within the built environments, in which New Zealand's ageing citizens reside. Architectural means through which this can be achieved are explored in the following section.

CONDITIONS FOR AGEING WITH DIGNITY

The architecture of residential built environments can significantly influence the human conditions of dignity. The degree to which one experiences each of the 7 conditions of dignity; Capacity, Self-worth, Solitude, Social power, Individuality, Health, and Ownership can all be influenced significantly by the built environment. It is through an exploration of the architectural considerations of these conditions that an architectural framework for a dignified ageing process can be developed to inform the design of the subsequent built environments in which ageing New Zealanders will reside.

CAPACITY

The first condition which can influence an individual's dignity in old age is Capacity. In contemporary societies, high physical and mental capacity corresponds to individuals being afforded respect and autonomy. Adulthood tends to be associated with high capacity, and conversely infants, and those members of society with less capacity, are seen as more vulnerable and dependent, and tend to require supervision and care. If

increasing chronological age is accompanied with diminished mental or physical abilities, then a common response from society can be the infantilisation of the older person. When infantilisation occurs the aged person is no longer treated with the respect of Adulthood,⁹ and instead is treated as someone dependent on assistance and supervision and therefore less important. For some, being dependent entails a loss of dignity.¹⁰ Emmanuelle Kant equates human dignity with basic autonomy,¹¹ and as one loses their capacity the sense of adulthood is lost, and consequently so too is basic human dignity.¹²

As people age, physical and cognitive capacities commonly diminish and although there is little that architects can do to stifle biological diminishment, the detrimental effects of ageing do need to be taken into account in the design and layout of housing.¹³ Certain characteristics and aspects of housing environments can impact and worsen the effect of ageing on capacity.

Therefore it is important that the built environments, which Architects design, maximise the capacity of the ageing inhabitant. Even if their functional capacity does deteriorate, older people are more likely to remain independent if built environments are supportive and age-friendly."¹⁴ Architects can encourage autonomy through the design of built environments forgiving of error,¹⁵ which relieve older people of any deficits¹⁶ they may be experiencing.

Architectural considerations which have the potential to extend and maximise one's capacity are design elements which encourage independence and autonomy of the ageing inhabitant.

ACCESSIBILITY

The first architectural consideration is the maximisation of accessibility into and throughout the home. Methods of achieving accessibility include utilising flat entrances and providing required living spaces¹⁷ on one level.¹⁸ Replacing narrow corridors, with extra wide circulation rooms, enables easy circulation, for those with limited abilities in wheelchairs or walking aides. New Zealand home's standard corridor width of 0.90m functions merely as a path, however, if circulation space width is increased to 1.20m, circulation spaces can be used for storage, and at 1.50m wide the circulation space becomes a room in its own right,¹⁹ which has the potential to become an area for other activities [Fig 12].

UNIVERSAL DESIGN

The second architectural consideration which enables ageing residents to retain their capacity is the specification of architectural elements and details which enable people with diminishing physical and mental functions, to be able to function as regularly as possible. Universal design and barrier free principals should be utilised throughout a home for an ageing inhabitant. Environments and products which are forgiving of error,²⁰ and relieve older people of their deficits²¹ are described

Figure 12: Becher and Rottkamp's Kettenhaus Corridor in Berlin illustrates how a widened corridor can become rooms within their own right, enabling a multitude of other functions including circulation, storage, display and work areas.

Figure 13: Barrier free bathroom sink

Figure 14: Barrier free kitchen sink

Figure 15: Level entry Shower

Figure 16: Full Height Windows

Figure 17: Sliding Door with extra long vertical handles

Figure 18: Movable cabinetry

Figures 13-18 illustrate architectural elements which have been designed utilising universal and accessible design principles. This enables those with diminishing physical capacity to continue to use these elements irrespective of physical diminishment.

as adhering to principals of Universal design. Barrier free sinks in bathrooms [Fig 13] and kitchens [Fig 14] allow aged inhabitants to continue using these elements even as physical mobility and capacity diminishes. Level entry showers [Fig 15] which are able to be walked or rolled into and which integrate shower seats and grab bars can aide autonomy of an ageing inhabitant. Utilising full length mirrors and windows [Figs 16 & 17] ensures those limited frequently to seated positions or bedridden can experience the same views and benefits of those able to stand.

Industrial design plays a significant role in increasing capacity of the ageing inhabitant. Specifying door levers in the place of door knobs, and mixer lever taps are all architectural considerations which are subtle yet have a marked impact on usability and capacity. Utilising easy slide doors [Fig 17] with extra-long vertical door handles allow people at various heights to use the doors in a regular manner without requiring excessive physical exertion or pain. Similarly, movable cabinetry [Fig 18] enables those with limited mobility to reach items.

LEGIBILITY OF SPACE

The third architectural consideration which impacts the capacity of an ageing resident with diminishing physical and cognitive functions is legibility of space. Making spaces as easy to understand and manoeuvre as possible for elderly people undergoing diminishment can be achieved in a variety of ways.

Figure 19: Bright colours utilised in the corridors of The Plussenburgh; an apartment complex for elderly by Arons en Gelauff Architects.

Figure 21: Space within The Sale House by Johnston Marklee & Associates are coloured to give each space a clear visual identity.

Figure 20: Contrasting colours clearly distinguish between two separate spaces in Anglesea Beach House by Andrew Maynard Architects.

Figure 22: Space within The Sale House by Johnston Marklee & Associates are coloured to give each space a clear visual identity.

Figure 23: Neut House by Apollo Architects & Associates, enables clear visual distinction between ceiling, floor and wall by using contrasting materials.

One such method is to utilise vibrant and distinctive colours in spaces [Figs 19-22]. Evidence suggests that this can help people remember where they are,²² as these stand out elements function as memorable markers within a space, from which occupants can orient themselves.

Another method of improving legibility is to clearly differentiate walls, ceilings and floors from each other. This can be achieved by utilising contrasting materiality and textures for each surface treatment [Fig 23]. This can aide an elderly occupant's physical orientation and stability²³ as it is clear where one element begins and ends.

These three considerations are aspects which designers need to consider and implement into the design of houses for the elderly if they are intending to maximise the capacity of a user undergoing diminishments of old age.

SELF-WORTH

The second condition required for dignity in old age is that of Self Worth. Self-worth is a socially subjective concept and is highly dependent on others perspectives of the self. The built environment, in which one resides, is often perceived as a physical mechanism for indication of status, and can therefore often impact and influence an individual's self-worth. Lawrence and Low postulate that dwellings are the focal point of personal and societal identities²⁴ and that Architecture has a symbolic purpose as a medium for the representation of status difference.²⁵ There is evidence that suggests that architectural features of buildings can trigger inferences about the presumed personality of their inhabitants²⁶ and the quality of Architecture can serve to communicate the personal status of an occupant

Figure 24 & 25: Dilapidated houses in the suburb of Sunnyvale, Auckland [above] and Titahi Bay, Wellington [below]. The poor condition of these properties conveys an image that the occupant is struggling which has a negative impact on an individual's Self-Worth

to others.²⁷ Therefore the built environment can be seen as an expression and extension of the individual and denote the status of those living within the home. With this in mind, the human condition of self-worth is linked to the physical condition of the homes in which aged New Zealanders live. The physical condition of home environments is therefore a crucial determinant of physiological and psychological wellbeing,²⁸ and certain architectural mechanisms can significantly influence an individual's Self-worth.

The inadequacies accompanying old age can often be conveyed publicly through the poor physical condition of the home environment. Clean, well maintained homes portray a sense of self-respect and pride held by inhabitants. Conversely, homes which are derelict and unkempt [Figs 24 & 25] convey images of inhabitants in a state of submission or weakness²⁹ which can evoke a sense of shame³⁰ for an individual. Dilapidated housing and the burden of maintenance and repair have been identified as major factors in prompting older people to disengage from the communities and shift into higher dependency residential environments.³¹

LOW MAINTENANCE

The first architectural mechanism which architects and designers can employ to enable self-worth is to provide home environments which require minimal on-going maintenance. This can be achieved through the selection of durable, high quality,

long lasting materials for cladding, roofing and glazing materials which require little upkeep to retain long lasting functionality and aesthetic quality.

In the design of a home's green space, specifying gardens which do not require intensive maintenance, and incorporating planter boxes instead of large expansive grass areas, hedges or trees which can easily become unkempt or overgrown can achieve this.

Designing built and landscape environments which require low physical maintenance and are easy to manage³² can enable a sense of self-worth to be communicated to the outside world through the medium of the home, irrespective of any physical and mental diminishment. Retention of this self-worth is essential to retaining dignity in old age, and these architectural mechanisms can enable this.

SOLITUDE

The third condition integral to dignity in old age is that of solitude. The degree to which one is granted solitude within a residential built environment is determined by the provision of privacy.

Privacy is a fundamental component to the construct of human dignity.³³ Privacy is vital to psychological health as it functions as a buffer between the pressures met in everyday social interactions and people's abilities to manage them.³⁴ Affording someone privacy acknowledges the individual as deserved of

respect. Experiencing solitude in old age is also determined by an individual's perceived sense of security in their home. Conversely, when one undergoes physical or social exposure by not being afforded privacy, the individual can become vulnerable, which is a key factor in stifling human dignity.

The architectural considerations of solitude play a significant role in enabling dignity in old age. The role of the architect is to provide home environments which give the occupant a sense of security and provide privacy, whilst limiting exposure and vulnerability. The degree to which one experiences privacy is dependent on the physical planning and layout of a dwelling in relation to the outside world, as well as the spatial relationships within a dwelling. Defining clear thresholds between inside and outside is a significant architectural consideration. In many mainstream residences, thresholds and boundaries are determined by spatial separation devices, such as walls and fences. The function of these is to clearly distinguish physical boundaries and enables clear spatial ownership. However in many cases these fences can often work to confine the inhabitant, resulting in a form of self-imposed isolation. Utilising more passive threshold defining methods such as indicative surface changes, low level planting and using the dwelling's walls as boundary fences are techniques of retaining privacy without isolating the occupant. Passive surveillance by the occupant should be enabled through the provision of sightlines throughout

the home from various vantage points to other spaces within the dwelling and beyond. It is also important that a variety of levels of privacy are provided within the dwelling. This can be achieved by utilising spatial hierarchy which ensures that spaces for more private functions are not exposed to the exterior street front.

SOCIAL POWER

The fourth condition which influences dignity in old age is social power. Throughout life, people experience varying degrees of social power, and this power often relates to the role one plays in society. Being allotted social power signifies that one's opinion matters, and one has the potential to affect others actions. Feeling able to contribute is dependent on social power, and contributing to society enables one to feel part of a community. However, as one ages, the decline of one's physical and mental state can result in older people becoming frail and vulnerable. In this state of vulnerability, humiliation and shame can much more easily occur, and contribute to a loss of dignity. Those suffering from the diminishments of old age such as sickness, frailty or disability are often stigmatised and treated differently by other members of society as they deviate from the socially established attributes which determine someone as ordinary and normal.³⁵ This stigmatisation of the elderly can often lead to exclusion from social interaction³⁶ and jeopardise ones role in society. This term stigma originally refers to bodily signs designed to expose something unusual or bad about the status of an individual,³⁷

and it can be shown that certain architectural elements can function as signifiers of these limitations and deficiencies of elderly inhabitants. The presence of these elements can result in stigmatisation of the elderly person and instigate a loss of social power. It is important that architects and designers eliminate stigmatising design elements from the dwellings of ageing citizens. Doing this enables inhabitants to retain social power and social contact³⁸ for as long as possible.

The first of these elements to eliminate is the ramp [Fig 26 & 27]. This element exists to make vertical movements smoother and to allow entrance into the home by those in wheelchairs, Zimmer frames, or those not able to easily step up. These are commonly retrofitted to enable access as a reaction to elderly inhabitants reducing capabilities.

Although these ramps do fulfil their function of enabling entrance, they also signify the limitations and deficiencies of those whom require them. Homes with flush entrances which require no vertical movements enable access to people with inadequacies without stigmatising the inhabitant as inferior. If ramps are necessitated, it is vital to integrate them into the built environment or the landscape to allow them to have multiple functions; such as planter beds, seating and stairs.

The second of these stigmatising architectural elements, are aides in the form of grab rails and seats found in many toilets [Fig 28] and showers [Fig 29] within dwellings of the elderly. These elements clearly communicate that the people using this shower

Figure 26 & 27: Tacked on access ramps. A reactive response to allow occupants with diminishing physical mobility to enter raised dwellings. The functional and austere nature of these ramps communicate the deficiencies of those who require them, which can stigmatise occupants.

Figure 28 & 29: Toilet grab rails and fold out shower seat. Installation of these elements is common place among elderly residents as a reaction to diminishing physical capacity.

Figure 30 & 31: Residential Chair Lifts. Installation of this mobility mechanism is becoming increasingly popular among ageing occupants wanting to stay in their two storey homes as their physical capacity diminishes.

Figure 32: Residential elevators. Installation of this mobility mechanism is becoming increasingly popular among ageing occupants wanting to stay in their two storey homes as their physical capacity diminishes.

and toilet are not able to do so without assistance from these external mechanisms.

The third stigmatising mechanisms have emerged as a result of elderly not wanting to vacate their two storey homes, regardless of their diminishing capability. As a way to retain vertical circulation between the two floors many are opting to install stair mounted lifts or elevators. These elements illustrate that the occupant has a shortcoming and cannot move vertically without assistance.

Although admittedly these three elements do aid the livelihood of residents by aiding in accessibility and capability of elderly people, my contention is with the purely functional and “tacked on” nature of these architectural mechanisms. These elements infer and illustrate the inhabitant’s inadequacies and stigmatise the inhabitant as weak and as vulnerable, eliminating social power and stifling dignity in old age. The role of the designer is to integrate these types of elements, so as to not obviously communicate the shortfalls and vulnerabilities of the inhabitant. This can be done through the provision of architectural mechanisms such as; flat entrances, single storeyed homes, integration of seating, railing and ramp features into the built form.

Figure 33: Thermopyles by SOA Architects utilises contrasting cladding materials to distinguish between separate dwellings.

Figure 34: Simplon A by T2.a Architects utilises contrasting colours on the facade to clearly distinguish between separate dwellings.

INDIVIDUALITY

The fifth condition influencing dignity in old age is that of individuality and self-expression.

The degree to which one can experience individuality depends on where one is located between the polarities of individuation and objectification. Being viewed as an individual, where ones' subjective attitudes and opinions are respected and valued, enables self-expression. Objectification, conversely, occurs when people are seen merely as objects, rather than a person in their own right. An object, as something frozen in the eyes of others, is static, predictable and interchangeable. Objectification can occur to elderly when they are perceived as a homogeneous group, with homogeneous requirements and desires. This objectification of the elderly can result in homogeneous built environments, as it is assumed that one single solution can apply to a large group of people. When the elderly are objectified by society, dignity can be either damaged or lost.³⁹ Therefore in order for dignity to be enabled for older people, architects should aim to create built environment which allow self-expression, in which the occupant's individual identity can be expressed. Architectural considerations of self-expression and individuality include affording the inhabitant control and choice over their built environment, and enabling the occupant to experience spatial ownership. Expressing a dwelling as something visually distinguishable from the surrounding built environments is vital to an individual's ability to associate and identify with a specific

space as being their home. This becomes especially significant when dwellings are adjoined. Being able to visually identify what is ones own and what is not is significantly influenced by external material selection. By incorporating contrasting material treatments [Fig 33] and colours [Fig 34] it is possible to clearly distinguish between separate dwellings. One strategy to enable individuality and self-expression is the individual's ability to choose and dictate the way they use a space. Traditionally, architects designate rooms to single living activities. It is important that Architects approach designing for the elderly as providing multiple spaces in which occupants can choose to undertake various living activities. Being able to sleep, eat, entertain, read and work in a multitude of locations is essential in enabling choice and therefore individuality. Providing choices in daily activities gives control over one's own routine therefore Architects should provide polyvalent spaces which can work for various activities. Architecturally this can be achieved through the provision of doors which function as a section of a wall which is able to slide into place to divide a space or retract to open up the space at the users' discretion. Generally the "older people get, the smaller their household becomes,"⁴⁰ which usually requires relinquishing possessions which people use to individualise space. This relinquishment of possessions can exemplify negative psychological impacts for an elderly occupant.⁴¹ This illustrates the importance of storage provision and display for these types of items. Providing wall based shelving is an efficient use of space, and enables adequate storage and functions as a place for

the occupants to display their belongings [Fig 35]. Similarly free standing storage shelving, [Figs 36 & 37] function in the same manner whilst also functioning as a spatial separator mechanism, which can break down the scale of the large open spaces.

Figure 35: Casa Kike by Gianni Botsford Architects illustrates how wall based storage can be integrated into the structure to maximise spatial effectiveness.

Figure 36: Anand Gowda's room separator Divide illustrates one mechanism for storage and display of possessions whilst simultaneously dividing spaces

Figure 37: Full height spatial separator shelving unit in Potts Point Apartment by Anthony Gill Architects functions to separate the dining room from the kitchen whilst still enabling views and communication between the two spaces.

HEALTH

The sixth condition influencing an individual's dignity in old age is physical and mental health. In order for New Zealand to have an older population that is resilient, independent and healthy, the home environments in which New Zealand's future ageing population will reside, need to enable physiological and psychological benefits⁴² necessary to human health, motivation and overall wellbeing.

PSYCHOLOGICAL DIMENSION OF HOME

Maslow's⁴³ *Hierarchy of Needs* pyramid identifies shelter as a most fundamental human requirement. The concept of *home* provides a psychological connection to a geographic location and more importantly binds a person emotionally to that place,⁴⁴ and the salience of the home and community increases with age.⁴⁵ The home is a physical setting in which experiences can occur.⁴⁶ Older people often develop a deep attachment to furniture, gardens, and spaces because of the memories associated with the homes. This becomes more pertinent as an individual ages and social roles are relinquished and one's identity becomes increasingly related to the spaces traversed as part of daily life.⁴⁷

Spatial layout is an architectural mechanism which can have significant influence on the psychological wellbeing of someone suffering from impairments associated with old age. In existing home design, if one of the occupants falls ill and becomes bedridden, they tend to be isolated in a bedroom removed from

the living spaces by long narrow corridors. Architects should utilise spatial opportunities such as locating the bedroom close to other living spaces, and separating them not by long corridors, but by doors which can easily open up to allow the bedroom to be part of the larger home. Allowing large partition sliding doors between the bedroom and adjacent spaces, with viewpoints from the bed to other spaces enables that person to still be included in daily activities.⁴⁸

PHYSIOLOGICAL DIMENSION OF HOME

90% of one's life is spent indoors,⁴⁹ and the design of buildings and features of this indoor environment can significantly affect the health⁵⁰ of its residents. Living in an unhealthy environment inhibits the ability of an older person to manage their daily life,⁵¹ and can lead to social isolation,⁵² loss of autonomy⁵³ and increased stress levels.⁵⁴ Unhealthy housing conditions can threaten wellbeing, reinforce dependency⁵⁵ and often result in premature entry into residential care.⁵⁶ Living in a cold and damp physical environment can increase the chances of severe physiological stress on older people,⁵⁷ and the development of respiratory conditions, coronary disease and hypothermia,⁵⁸ all of which have a detrimental effect on the well-being of elderly inhabitants.

A main cause of the diminishing mobility of seniors⁵⁹ are falls in the home, therefore homes with both interior and exterior level changes, or sited on topologically undulating sites can cause

difficulty in accessibility and circulation, increasing the likelihood of injuries.⁶⁰

The architectural considerations which can have significant impact on the health of the inhabitants focus on the physical conditions of the home, as well as the selection of a site with appropriate characteristics.

Architectural methods which maximise physiological health and are fundamental⁶¹ to human health include providing warm and dry homes. This can be achieved with double glazing, full insulation, good ventilation channels, utilisation of north facing passive solar gains and enabling natural light to penetrate deep into the home through the provision of full height north facade glazing. Using pendant and track lighting in place of recessed lighting is a method of minimising holes in the thermal envelope of a home. Limiting unnecessary level changes increase accessibility as well as limiting the chances of people falling or tripping. Utilising non-slip floor finishes, such as low pile carpeting, wooden boards and large format concrete tiles, limit chances and severity of potential injuries.

Ventilation is vital to a healthy physical environment, therefore openable windows on as many facades and openable skylights should be provided to enable passive cross ventilation. Ceiling mounted fans can be utilised to create air movement to ventilate a space and re-circulate warm air.

OWNERSHIP

Ownership is the seventh vital condition of dignity in old age. Home ownership functions as an avenue of financial investment and security for many, enabling one to liquidise and release equity accrued within their home if required. There is an imbued social status of living in and owning one's own home which can portray a sense of achievement. Evidence suggests that home ownership correlates to better housing condition and better occupant health,⁶² with owner occupied dwellings predicting "better mental health and respiratory function with fewer longstanding illnesses."⁶³ Conversely living environments which are rented, tend to be associated with poorer health outcomes and reduced wellbeing of occupants.⁶⁴ This can be explained by the fact that those unable to own their own home spend a higher proportion of their income on rent,⁶⁵ and display higher rates of cardio vascular disease and all-cause mortality than owner occupiers.⁶⁶

Home ownership is dependent on a multitude of social, political and economic factors, but the pertinent factor within the realm of influence of architects is the affordability of homes. Davey et al stress the need of affordable environments which match older people's financial resources.⁶⁷ Architectural considerations which can influence affordability and encourage ownership, include designing homes with efficient spatial footprints on smaller lots and modest engineering requirements. Ensuring low on-going maintenance and running costs can be achieved by incorporating

energy efficient design principals, and specification of low maintenance materials.

Programmatic decisions which can have a significant impact on affordability are illustrated at a macro organisational level. Intensifying existing suburban developments through subdividing existing lots and retrofitting existing built environments can minimise preparatory infrastructure costs and encourage affordability and ownership of dwellings whilst enabling passive income.

ARCHITECTURAL FRAMEWORK

The following table succinctly illustrates each condition of dignity, how these conditions can be achieved, and the architectural methods, mechanisms and spatial techniques which can be utilised to achieve the seven conditions of dignity in old age. This table functions as an architectural framework which is utilised as a basis of critique illustrating deficiencies of the existing living models and is utilised as a guideline used in the design development of the three design explorations.

SEVEN CONDITIONS OF HUMAN DIGNITY IN OLD AGE

CONDITION OF DIGNITY	GOAL TO ACHIEVE CONDITION OF DIGNITY	HOW GOAL CAN BE ACHIEVED	ARCHITECTURAL METHODS, MECHANISMS & SPATIAL TECHNIQUES	
			MICRO	MACRO
CAPACITY	The dwelling should: allow independence and autonomy of the ageing inhabitant if they undergo capacity diminishments.	a) Enabling simple and unproblematic accessibility into and throughout the home for users of all capabilities:	• Locate all required living spaces on one, ground accessible level. • Utilise flat and flush entrances • Replace standard (0.90m) narrow corridors with 1.50m extra wide corridors which can become circulation rooms.	• Avoid topologically difficult sites, which are only accessible via steps.
		b) Enabling environments which are forgiving of error to relieve older people of any deficits.	• Utilise universal design and barrier free principals. • Barrier free sinks in bathroom and kitchens. • Large area, level entry showers with integrated shower seats, enabling occupant to sit or stand, wash oneself or be washed by partner or caregiver. • Utilise full-height mirrors and windows for those limited frequently to seated positions or bedridden. • Door levers in the place of twisting door handles. • Levered mixer taps in place of twisting single temperature taps. • Utilise light-weight sliding doors with extra-long vertical door handles, allow people at various heights to use the doors in the same manner, without requiring excessive physical exertion or pain. • Small floor areas (preferably under 80m²) to minimise unnecessary physical exertion by bringing spaces within a close vicinity to each other. Compensate for this smaller floor area by removing ceiling and expose underside of roof form to increase perceived size of space. • Contrast door and window frames and light switches to maximise visibility. • Locate door handles and light switches at convenient heights (between 910mm to 1070mm).	• Locate homes within vicinity of amenities to enable older inhabitants to retain independence.

CONDITION OF DIGNITY	GOAL TO ACHIEVE CONDITION OF DIGNITY	HOW GOAL CAN BE ACHIEVED	ARCHITECTURAL METHODS, MECHANISMS & SPATIAL TECHNIQUES	
			MICRO	MACRO
		c) Enable legible spaces; maximise spatial awareness and enable a clear visual understanding architectural elements.	- Indicate spatial changes and distinguish spaces through use of a varied palette of surface materiality, colour and texture on walls, ceilings and floors. - Utilise high contrasting, bright coloured elements, such as doors, bench tops and furniture, to improve visual perception, and help people distinguish between elements. - Maximise natural light into the home using windows and skylights in strategic locations to maximise legibility.	
SELF WORTH	The dwelling should: require minimal maintenance to retain high quality physical condition.	a) Enable home environments which require little to no ongoing maintenance.	- Utilise durable, high quality, long lasting materials for cladding, roofing and glazing materials. Employ materials which will age gracefully; wood, metal and concrete as opposed to materials like fibre cement sheets or plastered stucco. - Specify gardens and outdoor areas which do not require intensive maintenance and up keep. Utilise small heightened planter boxes in the place of large open grass areas.	Each dwelling should maintain a relationship to the street, to be considered part of the wider community.
		b) Enable home environments which celebrate everyday living activities including mundane activities.	- Create architectural moments which celebrate the ability to perform daily activities - Top lighting spaces to improve spatial quality. - Spatial openness and connectedness - Maximise natural daylight with floor to ceiling windows on northern facades and skylights in locations to allow maximum light in and views out, from specific spaces within dwellings	

CONDITION OF DIGNITY	GOAL TO ACHIEVE CONDITION OF DIGNITY	HOW GOAL CAN BE ACHIEVED	ARCHITECTURAL METHODS, MECHANISMS & SPATIAL TECHNIQUES	
			MICRO	MACRO
SOLITUDE	The dwelling should: provide a retreat, where privacy and security is provided to the occupant.	a) Enable home environments which provide the occupant with progressive levels of privacy.	- Clearly define thresholds between inside and outside in the form of texture and materiality changes upon entrance. - Primary, secondary and tertiary spaces illustrate a variety of privacy levels for different living activities. - Enable passive surveillance, through the provision of sightlines through the home from various vantage points. - Provide ample private outdoor space which is both internally and externally accessed. - Utilise sliding doors into bedrooms and bathroom to separate room when privacy is required. - Utilise passive threshold defining methods such as indicative surface changes, planter boxes in the place of high fences and walls as privacy and security mechanisms. - Long slender glazing, which limits views in from far away. - Shower as a concealed compartment to be most private space of all.	Ensure passive surveillance and visual connection to street and surrounding neighbours.
		b) Provide a sense of security and privacy and limit exposure and vulnerability.		
SOCIAL POWER	The dwelling should: provide a vessel for social capital and omit any architectural elements which label or stigmatise the inhabitant as deviating from socially accepted norms.	a) Ensure any architectural elements are not the catalyst for subjugation and differential treatment of the occupant.	Eliminating “tacked on” single use architectural elements which can stigmatise the elderly occupant as deviating from the norm. - Access ramps - Grab rails - Fold down shower seats - Stair lifts - Home elevators	The home should not read as being only for and restricted to elderly occupants. The home should function successfully for those from a range of age and abilities, life stages and social situations.

CONDITION OF DIGNITY	GOAL TO ACHIEVE CONDITION OF DIGNITY	HOW GOAL CAN BE ACHIEVED	ARCHITECTURAL METHODS, MECHANISMS & SPATIAL TECHNIQUES	
			MICRO	MACRO
		a) Integrate multi use design elements which improve usability.	- Place bathroom vanity next to toilet to function as storage and integrate grab bar. - Entrance ramp in the place of a tacked on single use access ramp, utilise the need for sloped entrances into the landscaping of the site. The entrance area can integrate steps, ramps, planters and seats as a mechanism which enables simple access as well as a unique entrance experience.	
INDIVIDUALITY	The dwelling should: utilise architectural mechanisms which respect the individual, enable self-expression and prevent objectification and homogenisation of living environments.	a) Enable the ageing inhabitant to dictate how they use the spaces.	- Design polyvalent spaces so that occupants can choose to sleep, eat, entertain, read, work, in a multitude of areas in the home. - Eliminate standardised room designations; to enable multiple living activities able to occur in each space. For variety it is important that these homes illustrate flexibility and adaptability. An effective way of doing this within a small floor area is the open plan, which can maximise effective spatial use - Combine open plan living arrangement with furniture as room dividers. - Clearly define the kitchen to not be a thoroughfare. - Provide large sliding doors which function as walls which can slide into place to divide a space or retract to open up the space at the users' discretion. - Utilise a material palette, which is able to be treated and located in a variety of ways.	

CONDITION OF DIGNITY	GOAL TO ACHIEVE CONDITION OF DIGNITY	HOW GOAL CAN BE ACHIEVED	ARCHITECTURAL METHODS, MECHANISMS & SPATIAL TECHNIQUES	
			MICRO	MACRO
		b) Express dwellings' distinct identity from the surrounding built environments		Retain domestic scale of surrounding neighbourhoods, whilst differentiating the home as individual and unique by utilising unique forms, glazing proportions, materiality, colours, and roof planes.
		c) Provide ample space for possessions to individualise the space	Individualise and divide the room with large gridded shelving units for storing a range of items.	
HEALTH	The dwelling should: support psychological and physiological benefits necessary to human health, motivation and overall wellbeing.	a) Designing spatial arrangement which enable those sick and bedridden to remain part of daily activity.	- Locate the bedroom close to other living spaces, and separate them not by long corridors, but merely by doors which can easily open up to allow the bedroom to be part of the larger home. - Allow large partition sliding doors between the bedroom and adjacent spaces, with viewpoints from bed to other spaces to enable bedridden occupants to still be included as part of daily activities. - Provide ample space for in home care to occur if required.	Locate dwelling within close proximity to health care facilities.

CONDITION OF DIGNITY	GOAL TO ACHIEVE CONDITION OF DIGNITY	HOW GOAL CAN BE ACHIEVED	ARCHITECTURAL METHODS, MECHANISMS & SPATIAL TECHNIQUES	
			MICRO	MACRO
		b) Designing a warm home	• Double glazing • Full insulation • Limit heat loss caused by draughts under doors and windows common in older houses. Use pendant and track lighting in place of recessed lighting as a method of minimising holes in the thermal envelope of a home. • Limit level changes to increase accessibility as well as limit the chances of people falling or tripping. Utilise non slip, soft floor materials to limit the chances and severity of potential injuries.	• Site house to utilise north facing passive solar gains. • Enable natural light to penetrate deep into the home, through the provision of full height north facade glazing.
		c) Designing a dry home.	• Ensure passive natural ventilation channels through the use of openable windows on as many facades as possible, as well as openable skylights for ventilation.	• Site house to enable ventilation.
		d) Provide access to ample private outdoor area.	• Private decks and gardens enable occupants to maintain relationship with the outdoors. Ideally these outdoor areas should be located to maximise sun throughout the day.	
OWNERSHIP	The dwelling should: enable and encourage financial ownership.	a) Financially affordable	• Efficient spatial design with modest footprints- under 80m² • Modest engineering requirements. Efficient structural lines, right angle corners. • Ensure low running and ongoing maintenance costs through the incorporation of energy efficient design principals such as north facing glazing, thermal mass, and modest footprints. • Omission of unnecessary ornamentation of façade features and roof planes. • Utilise direct material for the finish, exposed shuttered concrete, unpainted cedar boards, powder coated metal profile roofing and cladding to reduce maintenance requirements.	• Modest section sizes • Site specific and responsive dwellings which use the contours of the site

CONDITION OF DIGNITY	GOAL TO ACHIEVE CONDITION OF DIGNITY	HOW GOAL CAN BE ACHIEVED	ARCHITECTURAL METHODS, MECHANISMS & SPATIAL TECHNIQUES	
			MICRO	MACRO
	The dwelling should: allow clearly defined spatial ownership and a sense of ownership over specific spaces.	a) Provide a distinguishable aesthetic identity from surrounding homes.	Utilising passive yet clearly defined boundaries as thresholds between properties, such as varying surface treatments, between grassed area, brick paving, half and half crosshatch paving (used on walkable car parks) to illustrate varying degrees of ownership. Inset pavers defining properties, or low level planting in the place of visually impermeable 2 meter high fences.	- Clearly distinguishable identity from others - Utilise a material palette which is distinguishable from the generic and homogeneous residential façade and roof and cladding materials.

(Endnotes)

- 1 (Arendt, 1958, p. 49)
- 2 (Nord, 2008) quoting (Torrington, 2004)
- 3 (Davey J. , Housing for Ageing New Zealanders, 2008, p. 43)
- 4 (Saville-Smith, James, Warren, & Coleman, July 2009, p. i)
- 5 (Derenick, 2008, p. abstract)
- 6 (Derenick, 2008, p. 72)
- 7 (Derenick, 2008, p. 72)
- 8 (Derenick, 2008, p. 72)
- 9 (Moody, 1998, p. 26)
- 10 (Moody, 1998, p. 29)
- 11 (Moody, 1998, p. 28)
- 12 (Moody, 1998, p. 26)
- 13 (Cunniffe, 1994)
- 14 (Grant B. C., 2006, p. 103)
- 15 (Herwig, 2008, p. 23)
- 16 (Knigge, 2008, p. 42)
- 17 Required living spaces, refer to access, Kitchen, bedroom, bathroom, living area (lounge) dining area.
- 18 (Davey J. , 2006, p. 137)
- 19 (Schneider & Till, 2007, p. 149)
- 20 (Herwig, 2008, p. 23)
- 21 (Knigge, 2008, p. 42)
- 22 (Commission for Architecture and the Built Environment, 2009, p. 8)
- 23 (C-Lab, 2011, p. 38)
- 24 (Lawrence & Low, 1990, p. 492)
- 25 (Lawrence & Low, 1990, p. 463)
- 26 (Maass, Ilaria Merici, Furlani, Gaburro, Getrevi, & Masserini, 2006, p. 682)
- 27 (Robinson & Thompson, 1999, p. 253)
- 28 (Davey, Joux, Nana, & Arcus, 2004) quoting (Howden-Chapman & Wilson, 2000)
- 29 (Moody, 1998, p. 24)
- 30 (Moody, 1998, p. 24) shame is experienced when one carries out an action which society considers inappropriate
- 31 (James, Saville-Smith, & Jaques, 2012, p. 2)
- 32 (Dwyer, Gray, & Renwick, 2000, p. quoting a study undertaken in the United Kingdom)
- 33 (Moody, 1998, p. 25)
- 34 (Lipman & Slater, 1977, p. 290)

- 35 (Goffman, 1963, p. 2)
- 36 (Livingston, 2000, p. 183)
- 37 (Goffman, 1963, p. 1)
- 38 (Davey, Joux, Nana, & Arcus, 2004, p. 13)
- 39 (Moody, 1998, p. 28)
- 40 (Smets, 2009, p. 270)
- 41 (Davey, Joux, Nana, & Arcus, 2004, p. 143)
- 42 (Davey, Joux, Nana, & Arcus, 2004, p. 16)
- 43 (Maslow, 1943)
- 44 (Rubinstein & Parmelee, 1992)
- 45 (Kellaher, 2004)
- 46 (Rubinstein & Parmelee, 1992)
- 47 (McHugh K. , 2003)
- 48 (Arons & Gelauff, 2011, p. 154)
- 49 (Howden-Chapman, et al., 2005, p. 2600)
- 50 (Mant & Gray, 1986)
- 51 (Davey J. , 2006, p. 130)
- 52 (Davey, Joux, Nana, & Arcus, 2004, p. 24) (Podger, 1998, p. Abstract only cited)
- 53 (Davey J. , 2006, p. 140)
- 54 (Davey, Joux, Nana, & Arcus, 2004, p. 24) (Podger, 1998, p. Abstract only cited)
- 55 (Harrison & Davies, 2001) (Tinker, Wright, McCreadie, Askham, Hancock, & Holmes, 1999)
- 56 (Davey J. , 2006, p. 130)
- 57 (Howden-Chapman, Signal, & Crane., Housing and health in Older people: Ageing in Place, 1999)
- 58 (Davey, Joux, Nana, & Arcus, 2004, p. 24) (Podger, 1998, p. Abstract only cited)
- 59 (Smets, 2009, p. 272)
- 60 (Davey, Joux, Nana, & Arcus, 2004, p. 24) (Podger, 1998, p. Abstract only cited)
- 61 (Howden-Chapman, et al., 2005, p. 2600)
- 62 (Davey, Joux, Nana, & Arcus, 2004, p. 27) *Housing tenure refers to whether or not one owns the home that they live in or not.*
- 63 (Davey, Joux, Nana, & Arcus, 2004, p. 27) quoting (Macintyre, Ellaway, Der, Ford, & Hunt, 1998)
- 64 (Davey, Joux, Nana, & Arcus, 2004, p. 27) quoting (Waters, 2001)
- 65 (Davey, Joux, Nana, & Arcus, 2004, p. 27) (Phibbs, 1999)
- 66 (Davey, Joux, Nana, & Arcus, 2004, p. 27) quoting (Sundquist & Johansson, 1997)
- 67 (Davey, Joux, Nana, & Arcus, 2004, p. 23)

CHAPTER 4:

AN EXPLORATION OF CASE STUDIES

The aim of this chapter is to ascertain whether or not New Zealand's existing housing stock, in its current state, adequately provides the seven conditions required from a built environment for a dignified ageing process.

There are three key living models for ageing New Zealanders. The first is to move to a specially designed communal living arrangement. The second is to move into a residential care institution. The third is to remain in one's home and age in place.

This chapter utilises the seven conditions of dignity as a framework to critique these existing living options for the elderly to determine whether or not these models are likely to provide living environments which enable dignity in old age.

OPTION 1. ASSISTED LIVING-RETIREMENT COMMUNITIES.

Purpose-built retirement communities have become one of the most visible and attractive¹ options for many ageing New Zealanders.² For ageing New Zealanders undergoing a diminishment in health, mobility or cognitive functions, those struggling to maintain or afford large properties or those experiencing a perceived decline of security and social isolation, retirement communities offer an alternative living arrangement perceived by many as a solution to these issues. Since their introduction into New Zealand in the 1950's, retirement villages and communities have flourished. Today these communities house many of New Zealand's elderly population and their distinctive appearance is an ever recognisable part of suburban fabric. The critique of the case study *Whitby Lakes Retirement Village*, explores reasons why this living model has become so prolific throughout New Zealand, whilst illustrating the limitations and deficiencies of these living environments in providing dignity for ageing New Zealanders in the future.

A retirement community is defined as any built environment which is made up of properties or buildings, for which residents agree to pay, a capital sum. These purpose built communities contain two or more residential units, with the function of providing residential accommodation, together with services³ and access to ancillary facilities. These retirement communities are planned spatial concentrations of elderly people,⁴ with

the majority of those in New Zealand consisting of between 40 and 170 homes. The retirement community, as it exists in contemporary New Zealand society, originates in the 1950s⁵ when facilities for low-income elderly were established by charitable trusts.⁶ At the time this living model was designed primarily to support the frail and dependent older person, and age-segregated housing was the domain of the not-for-profit sector.⁷ However the most recent 25 years has seen substantial growth in New Zealand's retirement village industry.⁸ This growth, spurred by extending life spans and changing family structures, has seen the privatisation of the retirement community industry resulting in the majority of New Zealand's villages now being owned by private organisations.⁹ As a result of this privatisation, the 21st century retirement village is completely different to the original villages.¹⁰ The modesty and charity associated with initial retirement communities for frail, low-income and vulnerable elderly members of society has been replaced by for-profit segregated developments, marketed as places to lead lifestyles of leisure. Retirement villages today are becoming increasingly exclusive, evidenced by the increase in waiting lists and interviews conducted by existing residents required for entrance into many communities.

As the population ages these types of communities are expected to gain popularity among those ageing citizens looking for a place to live out their remaining years. Using Whitby Lakes Retirement Villages¹¹ as a case study, the following section is a critique which

attempts to determine whether or not this type of living model will provide home environments which incubate and enable dignity in old age for ageing New Zealanders.

The design of the village as a whole [Figs 38 & 39] and how it fits into the larger community, as well as the design of a typical dwelling [Fig 40], is critiqued against the theoretical framework developed previously to illustrate deficiencies of this architectural model.

Figure 38: Aerial Perspective illustrating the extent of Whitby Lake Retirement Village.

Figure 39: Aerial Perspective illustrating the extent of Whitby Lake Retirement Village.

Figure 40 : 19 New Haven Way is the dwelling used as the case study house within Whitby Lakes Retirement Village. This dwelling illustrates characteristics typical to all the homes within this village

CAPACITY

The intention of retirement communities is to advocate and facilitate independent living to allow a high quality of life to be attained as the ageing process becomes more evident.¹² In order for residents to remain independent for as long as possible,¹³ it is imperative that the built environments maximise the capacity of the residents to undertake daily activities. These specialised retirement villages are designed to mimic real life neighbourhoods which results in the individual houses within these communities mimicking mainstream housing stock. As a result these dwellings tend to include standardised architectural elements, which do not take into account the needs of occupants with reduced physical capabilities, which becomes more common among the elderly cohort. Although these dwellings are for occupation exclusively for elderly people, very few architectural mechanisms are included in the design of these houses which aid the occupant with diminishing capacity. These dwellings illustrate the use of standard door and corridor widths which limit accessibility for those with limited mobility in wheelchairs and Zimmer frames [Fig 41]. The arrangement of and details within the bathroom [Fig 42], are standardised, evidenced by the use of a standard shower tray which require stepping up into. These showers do not provide space for someone to sit, or anything to hold onto which can be difficult for those with diminishing dexterity and mobility.

Figure 42: Sectional perspective cutting through the garage, toilet, en suite bathroom and bedroom. The standardisation of certain elements within the dwelling, including a standard step into shower, makes it difficult for occupants with diminishing mobility and dexterity to use, reducing the opportunity for the occupant to retain capacity.

Figure 43: Sectional perspective cutting through the kitchen, corridor and spare bedroom. The standardisation of certain elements within the kitchen, including standard kitchen cabinetry, makes it difficult for occupants with diminishing mobility and dexterity to use, reducing the opportunity for the occupant to retain capacity.

The kitchen and hallways [Fig 43] have not been designed with mobility impaired occupants in mind. The fixed cabinetry and the standard width corridors functions as barriers for wheelchair bound occupants, making circulation throughout the house, and the use of the kitchen difficult. Although many of the homes have flush entrances, which is a positive attribute, many others include steps [Fig 44] without any type of contrasting. These are a falling risk, and also a barrier for those with diminishing mobility.

Although there are some dwellings within this community which provide all living spaces on one floor (which is by no means unique to this community), many are double storey [Fig 45]. Although this is beneficial for architectural heterogeneity within the community, without the installation of stair lifts or residential elevators, the upper level can become disused by occupants with mobility impairments.

The fact that these dwellings are intended for elderly people yet the design of these environments seems not to take into consideration the common impairments among this demographic illustrates a lack of forethought on the part of the developers of this community. A built environment which enables residents to function even as their capacity to do things for themselves diminishes, is necessary for human dignity.¹⁴ These dwellings illustrate very few beneficial architectural considerations to encourage capacity.

Figure 44: Implementation of stairs in place of flat entry thresholds at the entrance into some homes limits accessibility of an occupant suffering from mobility impairments.

Figure 45: Double storeyed dwellings may not be ideal for occupants experiencing mobility impairments as they may not be able to utilise the upper level without the need for stair lifts or residential elevators.

SELF-WORTH

Self-worth is intrinsically linked to the physical condition of the dwelling as this correlates to the condition of those living within. The elderly intend to portray to the outside world a high standard of physical appearance in their home as a mark of pride. Developers of retirement communities understand this and intentionally portray these environments as places where a high quality of home appearance can be attained. This is achieved through the enforcement of high aesthetic standards of the physical condition of the houses and surrounding grounds. In this way, a clean, well maintained village is the image portrayed to the surrounding community. This responsibility of maintenance falls on the residents. However due to the increased likelihood of physical diminishments occurring in old age, residents are often physically unable to undertake much of this maintenance work.

This results in outside help often being required. In Whitby Lakes Retirement Village this service is provided by the village operators who cover “external building maintenance, exterior window cleaning, gardening and landscaping and cleaning of common areas.”¹⁵ Although this aesthetic quality is evident within the village [Fig 46], the services required to achieve this comes at a steep financial cost. For these maintenance services residents pay \$477.98¹⁶ per month, at a time in someone’s life when income is limited, with the average pension paying \$1429.68¹⁷ per month. These maintenance costs account for 33% of an elderly occupant’s income which, for many, is difficult to afford. The high aesthetic appearance of the home does contribute positively to the self-worth of the occupant. However, the expense of achieving it, results in a high number of people who are unable to afford the cost being excluded from attaining self-worth.

Figure 46: Illustrating the well maintained buildings and grounds within Whitby Lakes Retirement Village. The high aesthetic quality portrays high self-worth of those living within to any visitors.

SOLITUDE

There are certain factors which contribute to the formation of the human condition of solitude. Privacy and security are the essential determinants to psychological and physiological wellbeing in old age.

Within the Whitby Lakes dwelling, the spatial arrangement is relatively standard, and does not enable mutual and passive surveillance between co-inhabitants. The separation of living areas and bedrooms which is typical of New Zealand's housing stock means that if a resident becomes bedridden, they are removed from daily activities and going's on, secluded in a bedroom [Fig 53]. It is important that dwellings for the elderly consider the fact that the likelihood of becoming bedridden increases with age. If this does occur, it is important to enable these bedridden occupants to maintain communication and remain part of the goings on within the dwelling.

Retirement communities are intentionally designed to be safe and secure places,¹⁸ and this case study illustrates three distinct architectural mechanisms which attempt to ensure privacy and security of the residents is maximised.

The first architectural mechanism is the fences which surround the entire community, [Figs 47, 48, 49 & 50] which function as physical barriers and deterrents on the boundaries of these communities to clearly define the threshold between inside and outside of the community.

Figure 47: High visually impregnable fences surround Whitby Village functioning as physical barriers and deterrents on the site boundary.

Figure 48,49,50: Fences which function as physical barriers and deterrents on the boundaries of the village clearly communicate to the public that they cannot proceed beyond these points.

The second architectural mechanism of privacy manifests itself in the form of fences around individual properties (Figs 51 & 52). These fences ensure that privacy is granted from other residents and between dwellings within the community.

Figure 51 & 52: Fences around the individual properties function to retain privacy from other residents within the village.

Figure 53: Illustrating how the spatial arrangement of these dwellings result in bedridden occupants being separated from living areas, isolating these residents in their bedroom.

The third mechanism found in this community is the residents control over entry and exit points [Figs 54, 55, 56 & 57] which allows the residents to remotely control the people who can enter.

These three architectural mechanisms are typical of New Zealand's retirement communities and Arons and Gelauff believe this tendency toward gated communities stems from perceptions that the world is a less safe place.¹⁹ Kastenbaum states that the fortress mentality of retirement communities is as a result of the tendencies of elderly to believe that "there are forces at work that would invade our inner citadel of privacy and autonomy and steal all we have remaining to us."²⁰ He understands the defended nature of these communities as an "evolving response to societal change,"²¹ as an attempt to "protect space from time."²² This insular nature is evidenced by the fact that although Newhaven Way is mapped as a public street, it is not publicly accessible, nor is it visible on Google street view. Access into the community was only made possible due to an Open day. This physical segregation is a significant area of concern, as this quest for security has resulted in a very isolated and insular residential typology. These villages sever older people off from younger generations which can lead to the "Ghetto-ization of elders,"²³ and as Davey et al state, places where elderly are removed from society is to the detriment of all.²⁴

Figure 54 & 55: Vehicular access is gained through gates at the main entrance to the village. These gates are electronically controlled by the residents.

Figure 56 & 57: Pedestrian access into the village is via locked gates only accessible by residents.

SOCIAL POWER

Social power is an important determinate to dignity being afforded in old age. Required for gaining social power is being part of a community where mutual assistance is granted and within which one's opinion is considered valuable. Because the inhabitants of these retirement communities are predominantly over 70 years of age, the majority of whom are widowed,²⁵ otherwise with an older partner²⁶ a strong focus is placed on the creation of a sense of community amongst the residents. Whitby Villages retirement village utilises architectural mechanisms to create a sense of community.

The first mechanism is the master plan of the community [Fig 38] which illustrates the concept of clustering housing units within a close physical proximity to each other, grouping them around a shared communal area, in the form of an outdoor area and community centre. This is often accredited with encouraging the formation of a sense of community and security.²⁷ These villages mimic mainstream neighbourhoods, with each Villa having their own letter box, front gardens and individual driveways. All of these mechanisms are utilised to give an impression that this village is like any other cul-de-sac or neighbourhood in the surrounding suburb. However these villages differ greatly to any surrounding street or neighbourhood. The significant difference is the lack of social heterogeneity.

Retirement communities are intentionally²⁸ self-segregating, with residents opting for a type of "social class homogeneity"²⁹ where

sameness rather than diversity is of the essence.³⁰ The reason for this is for many aged people, living in a community with clearly defined socio-cultural boundaries affords solace.³¹

These communities tend to encourage the grouping of inhabitants who are of similar ages, financial situations and social backgrounds.³² People of a certain age perceive it as less threatening³³ to be around people of their own age and lifestyle.³⁴

Social homogeneity is almost guaranteed within these communities. One of the first criteria of entrance into a retirement community is age. One must be over 55 to live within these places. This elimination of younger members of society which occurs within these communities is a method of preserving themselves and their way of life from the erosion of change. Any conventional adjacencies to the young are erased in these communities, meaning residents are not reminded that they are ageing.³⁵

Figure 58 & 59: Signage within and on the boundary fences which make it clear that unless you are a resident, you are not welcome within the Village.

In these communities not only are the aged based *others* eliminated, but so too are economic others.³⁶ Due to the fact that the move into a retirement village does require significant financial investment; residents tend to be relatively wealthy.

With Europeans accounting for 92.9%³⁷ of New Zealand's over 65 population it is understandable that the Retirement Villages in New Zealand tend to be home to middle class residents of European decent, with very few people of other ethnic groups residing in them.³⁸ Through this exclusivity of ethnicity, class, income³⁹ and age, homogeneity of residents is established. This homogeneity ensures the recognition of those "*others*"⁴⁰ who do not belong in this community which enables true surveillance from the residents. There are clear signs within the Village that unless you are a resident, you are not welcome [Figs 58 & 59].

A key concern is the fact that retirement communities encourage this social homogeneity. Ideally, older people should not be completely separated from the community and the proportion of older people in the population should be kept constant in all communities.⁴¹ Ageing people must understand that living in an age-segregated community, with homogeneity of residents is not an antidote for ageing.⁴²

INDIVIDUALITY

Being viewed as an individual and expressing ones autonomy is a significant factor to dignity in old age. Observations illustrate that retirement communities do not enable ageing residents to express their individuality through the medium of their home. The reason for this is that many retirement communities are built by developers "endeavouring to turn grey into gold."⁴³ This results in the standardisation of the architectural environment within retirement communities. Using a standard unit design for all homes is a method used to fast track both bureaucratic approval and construction.⁴⁴ This cookie cutter approach to housing has resulted in repetitive built environments of identical spatial arrangement, forms, material palette and colours, which lack site specific design considerations such as solar orientation.

Because these communities are sold to prospective buyers, developers often need to portray these communities as being different to regular neighbourhoods. A common marketing approach used is to portray an image of these communities as places where lifestyles of leisure and relaxation can take place,⁴⁵ with houses often described as "Villa's" to evoke connotations of more exotic environments. In order to allow these images to become reality, individual homes become part of an overarching vision, adhering to specific aesthetic rules and restrictions to ensure a cohesive overall vision of the community. This is so vital to the value of the community that covenants exist in ownership agreements which ensure that changes are not made to the

exterior appearance of homes by the occupants. These covenants limit the resident's right to change the appearance of their house. This can stifle development and essentially freeze these communities in the time they were built.

Figure 60,61 & 62: Homogeneous and repetitive built environments within the Village which cannot be aesthetically altered, stifles residents ability to individualise their residences.

The prominent appearance of these repetitive villas on sales and marketing material of these retirement communities illustrate that the developers see this homogeneity of built environment as a positive attribute, responding to the demand from elderly clientele, many of whom prefer sameness in style of housing, as it affords solace.⁴⁶

Figure 63,64 & 65: Prominent use of homogeneous, repetitive housing on marketing material of Whitby Lakes Retirement Village illustrates that the developers see this sameness as a positive attribute, worthy of publicity.

It is my contention however, that this homogeneity of the built environment has a detrimental effect on the individuality and self-expression of ageing residents within these communities. This lack of variation expressed in the built environment perpetuates the homogeneity of the residents and stifles opportunities for the creation of self-identity. This lack of personality or point of difference expressed in any of the houses, leads me to agree with Gauchat who argues that these housing environments represent a warehousing of older people which contributes to the negative stereotypes of ageing.⁴⁷ These built environments are based on stereotypes of the aged, conveying ideas that the elderly are a homogeneous group. This can limit the resident's ability to express their individuality, and limit the ability of residents to age with dignity.

HEALTH

Retirement Village operators tend to privilege the lifestyle of leisure; reiterating the message that the life in these communities is "a vacation that never ends."⁴⁸ The most recent 40 years have seen the progression of marketing of retirement villages as being a place to start a new better life and have "based their appeal on instant relaxation."⁴⁹

Promotional material used today to arouse the interest of potential buyers tends to indicate a hassle-free lifestyle of perpetual leisure, in an environment which is "clean, well-maintained, modern and secure."⁵⁰ The websites and advertising

convey that a lifestyle within their retirement village is as much like a holiday lifestyle as possible.⁵¹ These communities are marketed as healthy environments where healthy lifestyles of leisure can take place. They are often strategically sited near amenities, to function as a hub for service provision⁵² and to cater to any health requirements of the residents. Marketing documents advertises double glazing, heat pumps and complete insulation as features to enable warmth and physical well-being of residents. However, these features are requirements of any new home built and not at all unique to retirement village homes. These villas are focussed toward the street, irrespective of location, illustrating little consideration for solar orientation. The typical 137m² floor area [Fig 66] is a large footprint which makes space heating and cooling an expensive exercise. Apart from the strategically placed emergency buttons in the villas,⁵³ architecturally these villas offer very little additional health benefits than any other newly built home in New Zealand does.

Figure 66: Axonometric perspective of 19 New Haven Way. The 137m² footprint of the dwelling can result in high heating and cooling costs

OWNERSHIP

For most, a house is the most significant investment that one will make in a life time. The steady and continuous accumulation of equity enables financial security and liquidity options if required needed in later life. Financial liquidity is one of the most important issues affecting housing choice. When someone purchases a house, there is an inherent understanding that at any point in the future they will be able to sell that asset which they have spent years accumulating.

However; the purchase and liquidity options when one buys into a retirement village is considerably different to the traditional notion of purchasing a home or unit.⁵⁴

Durrett states these pre-planned *communities* do not create community, they create business.⁵⁵ Eighty per cent of residents in New Zealand's Retirement villages have licence-to-occupy agreements with the operators of the village. ⁵⁶ This type of tenure is similar to long term leasing,⁵⁷ and it gives a person the right to dwell in a villa or apartment, and the use of common areas. ⁵⁸ However when one purchases a license to occupy, one does not legally own the property or the house on the property; and because one cannot gain ownership of the home or property they are not able to borrow money to buy it,⁵⁹ which means that in order to move into a retirement village, most need to sell their family home in order to fund such a move.

Even the 10%⁶⁰ of those living in Retirement Villages who own their home outright by purchasing a unit title which can be bought, sold, or mortgaged, usually have an "encumbrance" over them meaning there are "restrictions on who can buy the property."⁶¹ This limits the options of liquidity of the home if for any number of reasons one has to sell their house.

If one does decide to sell their home in the retirement village, they will more than likely not get back 100% of what they paid. The reason for this is the "*Village Contribution*," also known as the "*Deferred Management Fee*." This lump sum of money is taken by the Village when the License to Occupy agreement is terminated by the occupant, which may be the result of a multitude of reasons, be they personal choice, health deterioration or death. This fee or contribution exists to cover costs, relating to "provisions of the common facilities and the maintenance costs not covered by the weekly fee, redecoration and refurbishment costs of the villa, and the cost incurred in reselling of the villa." ⁶² This fee can be a large percentage of the value of the home, up to 25%⁶³ which has a potential to significantly and negatively affect the return on investment.

The widespread nature of this ownership model leads to a conclusion that the usual benefits of ownership, which include; the choice to physically change ones environment to suit and to liquidify ones assets, simply does not exist in these villages throughout New Zealand.

CONCLUSION OF RETIREMENT VILLAGES

In summation, when this retirement village is critiqued against the criteria of the theoretical framework, it becomes clear that this living option is unlikely to provide built environments which enable dignity to be retained by ageing occupants. There are a plethora of deficiencies and limitations pertaining to the seven conditions required for dignity in old age. Although these villages are currently a popular living option for the aged portion of society, I posit that as the over 65 portion of the population progressively changes to consist primarily of baby boomers, with completely different requirements, this living option will not be a favoured or an appropriate one.

OPTION 2. INSTITUTIONAL LIVING

The second significant living option for aged New Zealanders is Institutional living. In 2011, 32,000 aged New Zealanders lived in around 700 residential care facilities.⁶⁴ This number is expected to increase as the population ages, with an estimated additional 87,800 New Zealanders requiring residential care by 2051.⁶⁵

These institutions provide care and cater predominantly to older people with dependency levels which require some form of support from others.⁶⁶ The move into a rest home occurs usually as a last resort when community living becomes untenable.⁶⁷

ORIGINS OF THE CONTEMPORARY REST HOME LIVING MODEL

For the majority of the 20th century, care for older people was provided by Christian welfare based social organisations. When New Zealand shifted from a welfare state⁶⁸ toward a market economy in the late 20th century, the landscape of residential care for the elderly changed significantly and permanently. As a result Rest homes today are no longer the charitable enterprises they once were. Developers and companies have seen the monetary potential of developing these institutions, and the resulting built environments illustrate this shift.

CASE STUDY – HARBOURVIEW REST HOME, PAKAKOWHAI.

The case study which is selected to more definitively understand this type of living model is Harbourview Rest home in Pakakowhai, Wellington [Figs 67, 68, 69 & 70]. This institution is a good representation of many rest homes throughout New Zealand. This institution, with 69 single units, shared dining, shared lounges and nurses station, provides specialised care and round the clock supervision for vulnerable residents. The siting, aesthetic and spatial arrangement of Harbourview is relatively typical of this form of development in New Zealand. The observations take into account both programmatic and physical design of an individual room, the institution as a whole, and the response to the surrounding context. Harbourview is a relatively high end institution in the context of New Zealand's institutional Rest Home environments. This selection has been intentional, as this enables a critique which can focus on systemic and overarching issues of the living model, as opposed to focussing on the poor physical conditions of a lower end rest home. The aim of this case study is to illustrate the deficiencies of the built environment of this living model in providing a dignified ageing process for future ageing generations in New Zealand.

Figure 67: Location plan of Harbourview Rest Home, Papakowhai, Wellington

Figure 68: Aerial of Harbourview Rest Home, Papakowhai, Wellington

Figure 69: Harbourview Rest Home as seen from State Highway 1

Figure 70: Harbourview Rest Home as seen from Langwell Place looking North.

Figure 72: Ground Level of Harbourview Rest Home

CAPACITY

These institutions exist as a place to house residents experiencing considerable diminishment of both physical and mental capacity. The method these institutions utilise to deal with these diminishing capabilities is through the implementation of a social and organisational structure which is likened to that of the hotel guest and hotel manager relationship.⁶⁹ Within this structure, all daily activities are completed by staff and “basic activities like waking up, dressing, eating, bathing, and going to bed are placed under the rigid schedule of institutional life.”⁷⁰ Although this model is credited with enabling elderly more time for leisure activities and minimising the risk of injury to inhabitants, it has also been widely criticised for fostering and facilitating dependency on staff.⁷¹ Within this living model, even if the residents do have the capacity to complete daily activities the workers, systems and spatial arrangement of the built environment does not enable them to do so. Certain architectural mechanisms within the built environment of these institutions function to limit the capacity of the aged occupant. The first significant architectural mechanism which reduces capacity is the size of the private rooms. All private rooms typically range between 10m² and 15m² in area, provide space for a single medical bed, a small table and chair, a cabinet, and a shelving unit [Figs 73-78]. The size of these spaces restricts the amount of activities which can occur within these rooms. For example there are no cooking facilities, so cooking as an activity is precluded.

It is presumed that occupants within this environment cannot prepare, cook and clean for themselves, and provision of cooking facilities in residents rooms is undesirable for operators. By omitting these facilities, even occupants who may have some degree of capacity are not given the option to do so and must adhere to the institution's routines, irrespective of capacity. This results in all food preparation for the entire facility taking place in a single commercial kitchen on the Ground Level [Fig 72]. Here staff prepare food for all the residents to be served at prescribed times to be eaten only in the provided shared dining halls [Fig 79]. This standardises the eating experience of all residents to the routine of the institution regardless of individual capabilities. This segregation of function and compartmentalisation of the institution can result in living environments which are “unhealthy places that inhibit independence and autonomy.”⁷² This often results in what Lipman and Slater term “learned helplessness,” whereby one accepts the fact that they can no longer determine their own routine and lifestyle, which results in a systematic elimination of a residents’ personal autonomy, choice and self-determination. In this state of forced dependence, vulnerability can emerge, and dignity of the resident can be compromised and stifled.

Figure 73: Room Type A- 15m² room with shared Bathroom between rooms and accessed directly off of the corridor.

Figure 74: Room Type A perspective.

Figure 75: Room Type B- 10m² room, with private bathroom and set back access from the corridor.

Figure 76: Room Type B Perspective

Figure 77: Room Type C- 14m² room, accessed directly off of the corridor, with a private bathroom.

Figure 78: Room Type C perspective.

Figure 79: Shared dining room where meals are served at prescribed time with prescribed menus.

SELF-WORTH

The built environments serving old age are commonly devalued and marginalized,⁷³ and have associated negative connotations.⁷⁴ Institutionalisation is one of the most horrifying thoughts for many people, behind only unemployment and disability,⁷⁵ and “if there is one thing older people want, it is the peace of mind that comes with not having to relocate to a nursing home.”⁷⁶ Institutions are perceived as disabling in nature,⁷⁷ excluding the aged from social and economic life.⁷⁸ One’s self-worth can be decreased by the very act of being institutionalised, as it is perceived as an admission of failure on the part of the individual to look after oneself. Schwartz believes that “the notion of institutional environments brings with them, the stripping away of choice, rights and thereby dignity.”⁷⁹ The architecture of these institutions plays a significant role in diminishing the self-worth of the resident.

The first architectural mechanism is the limited provision of individual bathing spaces, which requires showering to take place in one of four common shared showers. These are a fair distance (the furthest distance from bedroom door to shared shower is 37m) from individuals bedroom [Fig 71]. This spatial arrangement can increase the occurrence of staff exposing residents’ naked bodies to the eyes of other patients or strangers.⁸⁰

Figure 80: One section of central corridor which runs the length of Harbourview Rest home. The long spans and lack of significant visual cues reinforce the sterile- institutional nature of the Rest Home.

The second architectural mechanism limiting self-worth is the presence of elements which constantly remind residents that they are within an institutional setting, as opposed to a home. The presence of a nurses station, a reception desk and offices at the main entrance, [Fig 71] communicate the fact that one is entering a controlled area. This serves as a reminder that residents need to be signed in and out as they leave. The long spinal corridor functions effectively as circulation however, also functions as a constant reminder that the resident is within the walls of an institution. Long lengths of corridors run without significant visual cues for residents to locate themselves [Fig 80]. This type of generic hallway is synonymous with a hospital setting.

Scaleability of care is essential to an efficient caregiving model. Therefore to make this type of development viable, developers and operators attempt to maximise profits by maximising the room numbers and overall floor area of the Rest home. As a result, these rest homes inevitably illustrate a large institutional scale. In an attempt to contextualise this large built environment within surrounding suburban area, the rest home is clad with materials usually used in residential construction. Plaster cladding and a terracotta tiled roof are utilised in an effort to downplay the scale of the Rest home. Irrespective of these material choices, the institutional scale clearly differentiates the rest home [Fig 81 & 82].

Figure 81 & 82: Perspectives of Harbourview Rest Home illustrating the suburban context in which the institution sits, and the degree to which the institutional scale differentiates the rest home from it's context

SOLITUDE

There are three architectural mechanisms found within these institutions which function to diminish resident privacy, inadvertently encouraging isolation and loneliness.

The first mechanism is the lack of a semi-private buffer zone between the residents' beds and common space. By the time these facilities are required, the residents tend to suffer from relatively unalterable disabilities,⁸³ which often requires full time care and ubiquitous observation. As a result these institutional living models tend to leave little space for privacy and self-determination.⁸⁴ This ever present observation means the resident becomes the "object of information, never the subject in communication."⁸⁵ The spatial arrangement of the private rooms in relation to the public corridor results in the residents' loss of personal privacy. When doors to private rooms are open (which they often are required to be for medical reasons) the resident's bed can be visually accessed directly by caregivers and other patients alike directly from the corridor [Fig 84]. The door to the individual's room is the only barrier between the public domain of the long continuous hallways, and the resident's bed. In response to this lack of privacy, many residents attempt to regain some form of privacy by isolating themselves from others, staying in their rooms for extended periods of time, which can have significant negative psychological impacts for residents, as loneliness is said to be the worst experience a human can have.⁸⁶ The second mechanism which limits resident privacy is

the shared bathrooms between many residents' rooms [Fig 83]. Although this minimises infrastructure and services, because these spaces are shared, the spatial ownership of this space can be unclear, and residents have to lock the door from their room to ensure privacy from the other room is granted. The third architectural mechanism which impacts solitude is the siting of the rest home. The siting of Harbourview Rest home is typical of this type of living model, which are often standalone buildings within already established suburbs [Fig 81 & 82]. Harbourview has its own private street for entrance which is the access to the Rest home. This intentional segregation makes institutions easily distinguishable and recognisable within suburban fabric, and can work to isolate residents from the outside world⁸⁷ even further.

Figure 83: Typical shared bathroom scenario (sliding doors removed for clarity). This arrangement can stifle the privacy of both occupants.

Figure 84: The spatial arrangement within Harbourview prioritises observation of patients over privacy. As a result visual access directly to a patient's bed is enabled from the public corridor.

Figure 85: Examples of headlines which negatively impacts upon public perception of life within the walls of a Rest Home.

SOCIAL POWER

As noted in previous chapters there is evidence that suggests that architectural features of buildings can trigger inferences about the presumed personality of their inhabitants⁸⁸ and the quality of Architecture can serve to communicate the personal status of an occupant to others.⁸⁹ Because the main function of these institutions is to cater to the debilitating side of ageing, these institutions are medically driven and usually entered in the terminal stage of life, and typically become the place where, once entered, one will pass away. At best, it will become the final home.⁹⁰ Social power is determined by not being dependent on the actions of others,⁹¹ however the scale and impersonal nature of structured routines found within these environments⁹² can lead to the psychological disease known as Institutional Neurosis, where residents suffer from a lack of initiative, loss of interest and submissiveness.⁹³ The development of this neurosis is detrimental to social power as residents come to be seen as patients rather than residents.

The negative stigma which is associated with rest home living can also function to damage social power. News coverage of negative occurrences [Fig 85] within these rest homes is prevalent. This has a significant negative impact on the perception of life within the walls of Rest homes, and the very fact that an individual resides can function to stifle social power of the occupant.

INDIVIDUALITY

In these rest homes, the residents stay is usually less than three years. As these institutions are medically driven, functional requirements tend to take precedence. This results in hospital-like infrastructures with highly regulated and standardised environments.⁹⁴ The focus on efficiency, both programmatic and financial has resulted in the homogeneity of the built environment.

The first architectural mechanism which negatively impacts on the individuality of the residents is the repetitive and homogeneous nature of the private rooms [Fig 73-78]. All rooms adhere to one of these room types. The restricted size of these rooms limits the resident's choice of the arrangement of beds and furnishings, and covenants placed on rooms by operators stifle any colour or material alterations to personalise the space. This results in near identical spatial arrangements within all the private rooms. This can have a detrimental effect on individuality as people struggle to distinguish their room from the other 68 surrounding theirs.

One method used by residents to individualise a room is by displaying personal belongings. However as the move into a rest home is a significant downsize of living space it often requires the resident to relinquish many belongings. This can have negative psychological effects as belongings are often intrinsically linked to identities and the lack of them can have a detrimental impact on the ability of the resident to express themselves.

HEALTH

The role of these institutions is to deal with the unalterable disabilities and frailties of old age, and this results in concentrations of older people requiring intensive nursing.⁹⁵ As a result, prescriptive⁹⁶ health and safety regulations seem to be the key influences impacting the design of these institutional environments. As they are medically focused, rest homes tend to struggle to maintain a home-like quality.⁹⁷ Minimising damage to residents' physical health is paramount within the walls of an institution. This is illustrated through a multitude of architectural mechanisms. The omission of personal cleaning facilities in attached bathrooms to ensure all bathing can be monitored; the removal of any level changes and the inclusion of handrails within the corridors are all elements which function to limit potential physiological harm of the residents. The presence of the nurse's station illustrates the medical focus of the institution and it is clear that maintaining physiological health is paramount. However this focus on physiological health, can be at the detriment to psychological health which seems to be a far less quantifiable secondary consideration. It is important that both physiological & psychological health is maintained by residents to ensure that dignity is retained by residents.

Figure 86: Axonometric perspective of Harbourview Rest Home

OWNERSHIP

The financial ownership structure within institutions is similar to that of retirement communities. Licences to occupy ownership agreements are standard ownership agreements. This licence entitles residents to occupy one room and use the facilities within the institution in exchange for an agreed sum which costs \$150,000-\$190,000 depending on room types and the individual Rest home. These licenses often include covenants, which restrict any alterations to a room. Once this is purchased there are weekly payments the resident must make, which varies between \$800 and \$900⁹⁸ to cover food, food preparation, health services, medication, power, rates etc. The majority of those institutionalised have to fund the move themselves, as long-term care insurance, which could pay the costs of institutionalisation, is not common place in New Zealand.⁹⁹ Although 80% of the upfront sum is repaid into the estate of the resident when they leave or die,¹⁰⁰ the institutionalisation process is a costly one, often detrimental to the resident or their family's financial situations.

CONCLUSION OF REST HOMES

In summation, when this Rest Home is critiqued against the criteria of the theoretical framework, it becomes clear that this living option does not provide built environments which enable dignity to be retained by ageing occupants. There are a plethora of deficiencies and limitations pertaining to the seven conditions required for dignity in old age. Although these institutions are perceived as a necessary living model for a portion of the population not able to care for themselves, I posit that as the over 65 portion of the population progressively changes to consists primarily of baby boomers, this living model will fall even further out of favour. The Baby Boomers have been placing their parents in these types of facilities as a last resort and believe these places are appallingly designed.⁸¹ Baby boomers, who have completely different requirements, are not content with what institutions have to offer⁸² and are expected to avoid institutionalisation at all costs.

OPTION 3. AGEING IN PLACE: INDEPENDENT LIVING

The third main living option for ageing New Zealanders, and one which is gaining significant popularity, is the concept of ageing in place. "Ageing in Place" is the new mantra for gerontology.¹⁰¹ Every year that a person is able to stay out of residential care, and in their own homes, the Government saves in excess of \$25,000,¹⁰² which explains why the concept is gaining support from policy makers, and being promoted by New Zealand's Ministry of Social Policy. Ageing in Place promotes the idea of people growing older in their own home¹⁰³ for as long as possible through the provision of appropriate home environments, support and care services.¹⁰⁴ By encouraging people to remain in their own homes¹⁰⁵ as they age, the ageing in place strategy seeks to counter negative perceptions of ageing,¹⁰⁶ and encourage independence; self-reliance and continued social involvement.¹⁰⁷ This approach is emerging as an effective method to afford dignity to ageing New Zealanders.

For many ageing New Zealanders, maintaining their independence is directly linked to remaining in their home,¹⁰⁸ and a vital determinant to retaining dignity throughout the ageing process. This mentality has resulted in a high proportion of older New Zealanders remaining in their own homes in their community until the end of their lives,¹⁰⁹ irrespective of the appropriateness of the house itself. It is expected that older people of the future will want to continue and further this

trend of ageing in their own home rather than in institutional residential care settings.¹¹⁰

The most significant determinant of enabling someone to Age in Place is the place itself; the built environment in which someone lives. As more people are expected to age in their homes, the question of whether or not New Zealand's existing building stock can enable and encourage ageing citizens with impaired physical and mental capabilities to continue to reside in their home environment in later life is becoming an ever more salient issue. And this has significant architectural consequences. Ageing in place as a strategy is promising. Unfortunately in practice it reveals significant challenges. The most poignant of all being that the majority of New Zealand's existing residential building stock that ageing New Zealanders will want to inhabit as they age, are expected to perform relatively poorly¹¹¹ in catering to the requirements of the aged. Therefore the state of New Zealand's residential building stock is seen as the largest hurdle to the success of allowing ageing New Zealanders to successfully age in place. The following section gives a chronological overview of the composition and characteristics of residential housing typologies of significance in New Zealand. The intent of this is to speculate on common issues that ageing New Zealanders are likely to face, as they attempt to age in place in mainstream residential housing stock in the coming years.

CHRONOLOGY, COMPOSITION AND CHARACTERISTICS OF NEW ZEALAND'S RESIDENTIAL HOUSING TYPOLOGIES ¹¹²

To understand the challenges of the built environment that inhibit people from ageing in place, it is important to note that those ageing New Zealanders wanting to age in place will have to select a living environment from the available housing stock.

Only 5-7% of New Zealand's 1,652,500¹¹³ private dwellings have been designed by architects.¹¹⁴ From the 1880's until 2013 the majority of New Zealand's building stock built has been volume housing built on Greenfield sites by developers, who then mark up and sell to consumers. This chapter explores the significant typologies in residential housing from 1880 to 2013. This includes the Villa, the Bungalow, the State House, 70's and 80's Houses and the 1990's McMansion. This exploration of these typologies illustrates that a large proportion of New Zealand's existing housing stock share a multitude of characteristics which, in their current state, have the potential to render them as inadequate in catering for many of the changing physiological and psychological requirements of New Zealand's ageing population.

THE VILLA

86,000¹¹⁵ Villas were built between 1880 and 1920, which accounts for 5.35% of today's housing stock. This first example of mass housing in New Zealand was built in suburbs on the fringes of cities, resulting in section sizes on which these house sit often being long, slender sites [Figs 87, 88 & 89]. The house typically sits toward the street front of the site, leaving ample space for a rear garden. The slender sites mean that houses are commonly built very close to the edge of the site, with only enough room for a slender pathway down the side of the house.

Figure 87: Subdivision plan shows the long, slender sites, for sale in 1863 intended for villas

Figure 88: Streetscape of a typical Villa Suburb in Ponsonby, 1960.

Figure 89: Aerial Perspective of Mt Victoria, Wellington, illustrates the close spatial relationship Villa sites and homes have to each other.

Externally these houses are characterised by decorative edged street facades with a bay window and veranda. The roofs are pitched hipped roofs of about 30-45° incline. They have small sashed windows and horizontal rusticated timber weatherboard cladding are common [Fig 90, 92 & 93]. The vast majority are single storey however they are more often than not raised from the street by entrance stairs.¹¹⁶

Figure 90: Street facade of a Villa in the suburb of Mt Victoria, Wellington. This archetypal Villa illustrates typical characteristics which include high pitch roof, small timber sashed windows, and weatherboard cladding.

Internally, the spatial arrangement in these homes is modest in size and rectangular in plan, with all rooms accessed directly to the left and right of a narrow central spinal corridor [Fig 91]. These rooms have generous ceiling heights ranging between 3050mm to 3650mm. The master bedroom and the living area (parlour) are typically found at the front of the plan, orientated toward the street irrespective of solar orientation or views. All other bedrooms face the side of the house and the services areas which include the pantry, kitchen, scullery and bathrooms are located to the rear of the plan, often in a lean to section of the home.

Figure 91: Internal layout of an archetypal Villa

Figure 92: Axonometric perspective of archetypal Villa

Figure 93: An early Villa from 1864 illustrates the decorative nature of the facade.

BUNGALOW

Between 1920 and 1935, 113,000¹¹⁷ Bungalows were built as part of developer subdivisions, and this typology comprises 7% of today's housing stock. As these homes were built in suburban areas, sections sizes were larger [Fig 94], which resulted in the building proportions becoming larger. On their section, bungalows were often offset to give a larger space on one side of the house, many of which later became driveways [Fig 97].

Externally these homes are characterised by a larger square plan, with deep entrance porches and a gabled low-pitch 15-25° roofs [Fig 95, 97 & 98]. Often clad with horizontal bevel-back weatherboards, bungalows have at least one street orientated bay window. Although they are all single storey, they are often raised from the street by entrance stairs. Bungalows are typically orientated towards the street, irrespective of solar orientation or views.

Internally these houses shared a similar spatial arrangement to the Villa, orientating living space and main bedroom toward the street facade with servicing spaces located at the rear [Fig 96]. However the bungalow had a less formal nature, with the removal of the formal central corridor for a wider hall, and lowering of ceilings heights.

It was only the depression of the mid 1930's which ceased growth of this typology.

Figure 94: Aerial perspective of Miramar, Wellington, illustrates the larger section sizes in this bungalow suburb.

Figure 95: Street Facade of an archetypal bungalow in the suburb of Miramar, Wellington.

Figure 96: Internal layout of an archetypal Bungalow.

Figure 97: An early bungalow from 1910-1915 illustrates the external characteristics.

Figure 98: Archetypal bungalow, offset on site enables access to the rear of the site.

STATE HOUSING-1930'S-1960.

Between 1930 and 1969, 479,000¹¹⁸ state homes were built in response to the considerable demand for affordable housing. These homes were built en masse [Fig 99, 100 & 101] to standardised plans [Fig 102], in new suburbs on the periphery

Figure 99, 100 & 101: New suburbs were created and the construction of State houses provided affordable houses throughout New Zealand.

Figure 102: Standardised plans used to construct State Houses. This enabled fast construction, and has resulted in identical residences in suburbs throughout New Zealand.

of cities. These became known as dormitory suburbs, as they functioned as living quarters for people who commuted into cities for work. Today, these dwellings constitute 29.9% of New Zealand's housing stock.

State houses are generally located on large suburban sections which vary between 708m² to 1000m². The side yard boundaries were a minimum of 1.5m on one side and 2.7m on the other to allow for car access [Fig 103]. Houses were located nearer the front boundary, generally a distance of 7.6 – 18.3m, to provide a larger back yard. These restrictions have resulted in state houses being well suited to alterations and subdivisions.

Figure 103: Aerial perspective of archetypal State houses in the suburb of Titahi Bay, Wellington.

External characteristics of this typology include a modestly sized, square plan with hipped or gabled concrete tiled roof with a 30° pitch. Modest facades with small windows and limited ornamentation as well as raised recessed front and rear porches are common of this typology [Fig 104].

Internally, state houses are characterised by a simple square plan, typically sized between 93m²-102m² with lower ceiling heights of between 2400mm to 2700mm. These homes were the first to implement the modernist open plan living areas. The desire for efficient layouts resulted in the minimisation of circulation spaces, and removal of the central corridor seen in previous housing types. State homes were the first to consider solar orientation, with the spatial arrangements ensuring that all habitable rooms received sunlight for at least part of the day. The living room was located to receive maximum sunlight; kitchens were generally located to receive morning sun and bedrooms morning or afternoon sun. The service areas such as the kitchen, laundry and bathroom were grouped together for efficiency [Fig 105].

By the end of the 1960's state houses had fallen out of favour and had a significant negative stigma associated to them, mainly as a result of the often derelict condition they were in, due to a lack of maintenance from the occupants.

Figure 104: Archetypal State house in the suburb of Titahi Bay, Wellington illustrates external characteristics

Figure 105: Floor plan illustrates the typical spatial arrangements of an archetypal State house.

SUBURBAN VOLUME HOMES OF 1970-1989

By the 1970s, the housing boom, driven by the influx of young Baby Boomers desiring home ownership, increased the demand for homes and drove the Government to ration both labour and materials and required those wanting to build houses bigger than 140m² to wait 18 months for a permit.¹¹⁹ This allowed developers, such as Neil Homes and Reidbuilt to thrive, and 151,000¹²⁰ houses were built in expanding suburban developments between 1970 -1978. These houses account for 9% of New Zealand's housing stock. By the end of the 1970's house size was no longer restricted and this era was the beginning of the large suburban home. Between 1978 and 1989, 182,000 houses were built which currently makes up 11.9% of the New Zealand housing stock. These homes were the first to require insulation, and the first to implement aluminium single glazed windows. These 80's homes differ from earlier houses in their larger floor areas, larger rooms and often multiple living rooms.

The reduction in the availability of flat sites contributed to the development of split-level designs. Section sizes were typically smaller than those in the 1950s and 1960s. Houses were positioned to give a smaller front yard and leave the larger area at the rear. Little consideration is made for solar orientation, and these homes are typically located close to the street as this reduced the cost of construction and reticulation of services.

External characteristics of these homes include simple rectangular or L shaped boxes with plain sheet metal, low pitched (12-15°) gable roofs with wide eaves and larger windows. This typology was the first to include single and double internal access car garages and aluminium windows and doors, and commonly used rusticated weatherboards and brick veneer [Fig 107 & 108].

Internally, the majority follow standardised plans which typically range between 110m² -130m², with 2400mm studs.¹²¹ Large open plan living areas are prevalent and bedrooms are located toward the rear of the house. Bedrooms and the bathroom, as with house styles of other periods, are accessed off a main corridor [Fig 106].

Figure 106: Internal layout of an archetypal 70's and 80's house.

Figure 107: 70's house in the suburb of Cambourne, Wellington illustrates archetypal external characteristics.

Figure 108: 80's house in the suburb of Whitby, Wellington illustrates archetypal external characteristics.

1990-2006 - THE NEW ZEALAND MCMANSION

Between 1990 and 2006, 313,000 homes were built which now constitute 19.5% of New Zealand's housing stock. These homes were predominantly built to standard plans as part of large subdivisions, and are colloquially referred to as McMansions due to the mass produced and large nature of these houses. Maximisation of developer profits were ensured by constructing as many houses with as larger floor areas as possible [Fig 109]. Externally, these homes are characterised by the use of more manufactured materials and monolithic cladding, such as fibrous cement cladding and polystyrene plaster systems [Fig 110], and tend to be built to minimal building code standards. Internally, these houses are characterised by large two storeyed rectangular plans, with living area on the ground floor, multiple bedrooms and bathrooms on the 1st floor, and internal vehicular access granted through street orientated snout garage [Figs 110 & 111].

Figure 109: Aerial perspective of archetypal McMansion houses in the suburb of Whitby, Wellington.

Figure 110: McMansion house in the suburb of Whitby, Wellington illustrates archetypal external characteristics.

Figure 111: Internal layout of an archetypal McMansion house (not to scale).

SUITABILITY OF HOUSING STOCK

The housing typologies which constitute the majority of New Zealand's housing stock, and which will be housing options for ageing New Zealanders intending to age in place, are unlikely to provide environments which cater to the unique requirements of ageing Baby Boomers. The following section gives evidence to this effect, illustrating deficiencies and inadequacies of these housing typologies by critiquing them against the architectural framework required to enable New Zealanders ageing baby boomers to age with dignity.

CAPACITY

The mental, physical and financial capacity of the individual to keep their homes in safe and comfortable conditions¹²² is vital to ensuring that people can age with dignity. The exploration of New Zealand's existing housing stock uncovers that most houses are expected to limit an aged occupant's capacity. Many of New Zealand's housing typologies are unforgiving of error, and exacerbate certain problems associated with old age.

The first requirement of a home to enable capacity is accessibility. However findings illustrate that the majority of New Zealand's housing stock is expected to cause difficulty with access for those with physical limitations. The Villa, Bungalow, State house and 70's/80's housing typologies all have raised access from street level with ground clearances of at least 600mm. These stepped entrances into these homes have the potential to limit access into

and out of the home without architectural intervention in the form of ramps [Figs 92, 93, 95, 97, 104 & 108].

80's houses and 1990's McMansion housing typologies have a higher prevalence of two storeyed homes and often sited on topologically difficult sections [Figs 107 & 110]. Of the 1,374,366 occupied private dwellings, 359,697¹²³ or 26.17% have two or more storeys. These double storey homes can incur significant limitations for residents with mobility impairments. If they also lack the range of day to day living spaces on the ground floor,¹²⁴ such as beds or cooking facilities, these types of houses may be unviable for these residents to live.

Accessibility throughout the home can be limited by the width of corridors and doors. The standard width of the corridor within these typologies varies between 0.8m and 1.00m. At this width, occupants with mobility issues requiring aid in the form of wheelchairs and zimmer frames, can struggle to move throughout the circulation spaces freely.

These mainstream housing typologies all utilise standardised door handles, taps, cabinetry, window proportions, swing doors, showers, and vanities. All of these elements are designed to function for the normal person devoid of any physical deficiencies, but these elements exacerbate usability issues and exclude those undergoing any type of capacity diminishment common with progressing age.

SELF-WORTH

In it's current state, the majority of New Zealand's residential housing stock has the potential to stifle the self-worth of older inhabitants. As self-worth is intrinsically linked to the physical condition of the home, houses which are easy to maintain enable self-worth to be more easily attained. An exploration of housing typologies, illustrates that many of New Zealand's require significant on-going maintenance.

This can be attributed to an array of factors, the first being floor area. As people age, their health begins to decline and they are less able to cope with the maintenance required in a large house.¹²⁵ The floor area of a house correlates to the amount of work required for upkeep, therefore the increase of floor areas of New Zealand homes in the last 130 years has an effect on maintenance practices and the demand on inhabitants. The floor areas of New Zealand's homes has been increasing continuously for 130 years. In the 1940's the average floor area of a house was 100m², in 1976 it increased to 121m². By 1986 it has grown to 134m², jumping to 175m² by 1996. In 2006 the average size of a newly build house was up to 209m².¹²⁶ Many homes are often too large for older people and require more maintenance than they can easily deal with¹²⁷ and as a result big houses are getting to be less and less fashionable.¹²⁸ New Zealand home owners have a record of poor maintenance practices,¹²⁹ and it becomes even more challenging for elderly residents to maintain large two storey 4-5 bedroom homes."¹³⁰

Figure 112: A visual illustration of the increase in average floor area of New Zealand houses between 1940 and 2006.

A high proportion of the housing stock is older than 50 years [Figs 90, 95 & 104]. The age of these typologies brings with it issues of wood creep and warping, which increases the likelihood of draughts under doors, through windows frames and holes and cracks in the floor boards.¹³¹ These issues increase the chance of the home having leaks, and being in poor condition, which have considerable maintenance implications.

The majority of the homes built in the last 50 years, have been specification homes built en masse. These homes were commonly clad with homogeneous manufactured materials such as stucco, plasterboard & brick veneer [Figs 107, 108, 110] as they were more cost effective. However this lower up-front cost has resulted in lower quality finishes and performance. This has resulted in many homes built over this period, requiring relatively constant maintenance and repair work which can be physically intensive and financially draining.

SOLITUDE

The standalone suburban house epitomises solitude. The solitude afforded in one's own residence, freestanding on its own site is associated with a psychological sense of privacy. This privacy seems to be dependent on spatial separation devices in the form of boundary fences, used to clearly illustrate what space is private. Mainstream New Zealander's fondness of the fence, stems from the perception that they act as a physical barrier to access and visual observation, which gives people a sense of security. The relatively austere manner of these often 2 meter high visually impermeable fences (profiled metal or wood boarding), which are found within all suburban housing typologies in New Zealand, seem an exaggerated attempt at privacy and spatial ownership. Consequently, with a housing stock so strictly divided by stark visual barriers, houses run the risk of becoming so private that they become austere and isolated, disconnecting residents from their surrounding neighbourhood context.

SOCIAL POWER

Much of New Zealand's residential housing stock is standardised and designed primarily for inhabitation by people who adhere to the requirements of conventional human function. This standardisation evident in New Zealand's residential housing stock is typical of western societies influenced by the Modernist manifesto of the early 20th century. A prime influence on this standardisation was Le Corbusier's understanding that humans are geometrical animals, which led him to conclude that "proportions of architecture can be derived from the standard measures of a uniform human body."¹³²

Figure 113: The Modulor Man by Le Corbusier, illustrates the understanding that man has standard geometric measurements which can be used to create spaces for inhabitation. This one size fits approach has been applied to architecture worldwide, and is prevalent in New Zealand's residential typologies. Fig 114: The Modulor Man inscribed into the concrete of Unité d'Habitation in Marseille, France.

These measures were "derived from a conception that body parts are functioning according to medical definitions of the normal biological body."¹³³

The majority of the houses which comprise New Zealand's existing residential building stock "demand certain physical abilities which reward and favour able bodied people as normal, but punishes and discriminate against those who deviate from the norm whom cannot meet those demands."¹³⁴ This results in seniors being excluded from the housing market.¹³⁵ This exclusion is "often unconscious and hidden,"¹³⁶ and perpetuated by a dominant group in society to protect the advantages they receive for being part of that group.¹³⁷ The requirements of those with deficiencies and limitations is often overlooked which can increase the chance of isolation and stigma.¹³⁸ This unintentional discrimination towards those citizens who do not adhere to the conventional human functions minimises social power and limits the ability for occupants to age with dignity.

Although policies are in place to limit the building of discriminatory buildings such as the Building Act 2004 and the Building Code¹³⁹ which require disabled access, these apply only to public buildings and these policies do not require access or facilities for physically restricted people in residential housing.

INDIVIDUALITY

*"Little boxes on the hillside,
Little boxes made of ticky-tacky,
Little boxes, little boxes,
Little boxes, all the same.
There's a green one and a pink one
and a blue one and a yellow one
And they're all made out of ticky-tacky¹⁴⁰
And they all look just the same."*

Excerpt from Malvina Reynolds 1962 song Little Boxes; a critique of mass housing, which the author believes applies to New Zealand's suburban environments.

As architectural features of buildings can trigger inferences about the presumed personality of their inhabitants, a person's house is seen by many as a significant opportunity for expression of the individual, and a way to differentiate oneself from others. However mainstream housing stock in New Zealand is comprised primarily of volume and specification homes. By their nature volume homes are detrimental to individuality, as they create repetitive re-productions of houses with near identical spatial arrangements and material palette. This results in streets and suburbs made up of slight variations of the same dwelling [Figs 89, 103, 109, 116 & 117]. Designers of the McMansion volume home have attempted aesthetic differentiation by implementing arbitrary additions such as overly complex roof forms, polystyrene extrusions and dormers, and the use of bright, bold colours [Fig 115]. Designers of mainstream housing typically differentiate areas and designate rooms and space to a single, specified activity. In doing this, the range of activities permitted to occur within each space is limited, and the way in which a user

can use the space is prescribed. This can diminish the occupant's choice and control over how they use the space, which is an important component in enabling individuality.

Fig 115: Archetypal McMansion utilising arbitrary roof planes, polystyrene extrusions and the application of bold sometimes ostentatious colours are used as a method of distinguishing separate dwellings.

Fig 116 & 117: Two houses in the suburb of Whitby, built from exactly the same plan. This type of homogeneity is very common throughout New Zealand's residential building stock.

HEALTH

Living in a healthy home is essential to human dignity in old age. Warm and dry homes are key determinants of maintaining physiological health for everyone, and becomes even more significant for the aged as older people tend to spend more time indoors, are more often sedentary,¹⁴¹ with less efficient body temperature regulating mechanisms.¹⁴² Residing in a cold indoor environment increases susceptibility to coronary and cerebral thrombosis and respiratory diseases.¹⁴³ A large proportion of New Zealand's housing stock share common architectural deficiencies which lead to a high prevalence of cold and damp living environments.

The first deficiency is a lack of insulation. Three quarters of New Zealand's residential building stock was built before April 1978¹⁴⁴ when minimum requirements for insulation were introduced. If any insulation was installed, it was ceiling insulation which tended to be of poor quality.¹⁴⁵ Studies show around 55% of homes have no wall insulation and 65% have un-insulated floors.¹⁴⁶

The second deficiency is poor solar orientation of homes.¹⁴⁷ In all major mass housing typologies, excluding state homes, street orientation is prioritised over solar orientation, resulting in a loss of potential passive solar gains.

The third deficiency that can be found in a majority of houses in New Zealand is single glazing.¹⁴⁸ Houses which are single glazed

have increased heat transfer between the interior and exterior, which can result in the dwelling becoming difficult and expensive to heat.

The fourth deficiency is the high rate of mould presence. Humid environments¹⁴⁹ combined with poor ventilation methods have resulted in a third of New Zealand households reporting mould.¹⁵⁰

These four deficiencies can have significantly detrimental impacts of the health of older people, increase incidences of illness, leading to early premature entry into residential care.¹⁵¹ The fact that in their current condition, each of the residential housing typologies have a number of these deficiencies is not a positive sign for the condition of health being positively influenced within these built environments.

OWNERSHIP

For many, home ownership is the most significant financial investment an individual makes in their lifetime and one's own home serves as an important icon for personal identity and family value.¹⁵² New Zealand Baby boomers hold home ownership in high regard, illustrated by the high rate of home ownership among this group. For this cohort, home ownership will also be the most significant determinant to fulfilling their desire of remaining in their homes for as long as possible as they age. The reason for this is that home ownership gives the individual the power to make necessary alterations and modifications required to cater to an individual's changing needs in the face of diminishing capabilities, as age progresses.

Mainstream houses which comprise the majority of New Zealand's residential building stock share architectural inadequacies and deficiencies, which mean that in their current condition, many of these homes are in fact expected to prevent people from successfully ageing in place with dignity.

CONCLUSION OF CHAPTER 4.0

In summation, the three existing main living options; Retirement communities, Rest homes, and the existing housing stock all exhibit multiple architectural inadequacies which can function to limit dignity of ageing residents. It becomes clear that these living models are unlikely to cater to the physiological and psychological requirements of the changing and increasing ageing population.

It is evident that these living models treat ageing as a homogeneous process. However the future ageing generation; the Baby Boomers, are anything but a homogeneous group. This group of New Zealanders represents a collection of individual philosophies of life that are increasingly varied,¹⁵³ and Grant believes that there is no one type of housing which can satisfy the diversification and heterogeneity of the rapidly expanding older population.¹⁵⁴ Davey et al emphasise that there is no single housing option which can be recommended to meet the future needs of older New Zealanders.¹⁵⁵

These conclusions call for new approaches to be explored, approaches which take into account existing and future social, political, environmental and economic conditions to propose alternative architectural models which can provide built environments which enable dignity to be retained throughout the ageing process.

(Endnotes)

- 1 (Grant B. , 2003, p. 1)
- 2 (Greenbrook, 2005, p. 37)
- 3 (Parliament of New Zealand, 2003, p. Section 6)
- 4 (Burgess, 1991, p. 4)
- 5 (Greenbrook, 2005, p. ii)
- 6 (Greenbrook, 2005, p. 32)
- 7 (Grant B. C., 2006, p. 103)
- 8 (Greenbrook, 2005, p. ii)
- 9 (Greenbrook, 2005, p. 31)
- 10 (Grant B. C., 2006, p. 103)
- 11 This Village is a good representation of many retirement villages throughout New Zealand. It's siting, aesthetic and overall planning composition is typical of this form of development in New Zealand.
- 12 (Grant B. C., 2006, pp. 103,106)
- 13 (Greenbrook, 2005, p. 23)
- 14 (Hansen, 2001)
- 15 (Whitby Lakes Retirement Village, Frequently Asked Questions, 2011, p. 2)
- 16 Sale brochures from Whitby Lake Retirement Village
- 17 (Zealand, 2013)
- 18 (Grant B. C., 2006, p. 106)
- 19 (Arons & Gelauff, 2011, p. 153)
- 20 (Kastenbaum, 1993)
- 21 (McHugh, 2000, p. 111)
- 22 (Kastenbaum, 1993, p. 181)
- 23 (Moody, 1998, p. 21)
- 24 (Davey, Joux, Nana, & Arcus, 2004, p. 146)
- 25 (Grant B. C., 2006, p. 104)
- 26 (Saville-Smith, James, Warren, & Coleman, July 2009, p. i)
- 27 (Australian Consumers Association, 1998, p. 28)
- 28 (Grant, 2003, p. 137) citing the New Zealand law commission
- 29 (Grant B. C., 2006, p. 106)
- 30 (Blaikie, 1999, p. 178)
- 31 (Grant B. C., 2006, p. 106)
- 32 (Grant B. C., 2006, p. 106)
- 33 (Moody, 1998, p. 21)
- 34 (Arons & Gelauff, 2011, p. 152)
- 35 (Simpson, 2011, p. 130)
- 36 (Simpson, 2011, p. 126)
- 37 (Greenbrook, 2005, p. 15)
- 38 (Greenbrook, 2005, p. 64)
- 39 (Greenbrook, 2005, p. 2)
- 40 (Laws, 1995, p. 267)
- 41 (Greenbrook, 2005, p. 27)
- 42 (Grant B. C., 2006, p. 105)
- 43 (Sawchuk, 1995)
- 44 (Davey, Joux, Nana, & Arcus, 2004, p. 110)
- 45 (Whitby Lakes Retirement Village, Whitby Village- A retirement Village- Enjoying Whitby Lakes, 2011)- The case study Whitby Lakes, supports and substantiates this on their website with the presence of "Live like you are on Holiday...always"
- 46 (Grant B. C., 2006, p. 106)
- 47 (Gauchat, 1999, pp. 20-21)
- 48 (Simpson, 2011, p. 127)
- 49 (Rosenfeld & Chapman, 2008, p. 18)
- 50 (Grant B. C., 2006, p. 104)
- 51 (Greenbrook, 2005, p. 34)
- 52 (Davey, Joux, Nana, & Arcus, 2004, p. 11)
- 53 (Whitby Lakes Retirement Village, Frequently Asked Questions, 2011, p. 4)
- 54 (Australian Consumers Association, 1998, p. 28)
- 55 (Durrett, 2009, p. 3)
- 56 (Grant B. C., 2006, p. 104)
- 57 (Davey, Joux, Nana, & Arcus, 2004, p. 140)
- 58 (Consumer Institute of New Zealand, 1998)
- 59 (Consumer Institute of New Zealand, 1998)
- 60 (Grant B. C., 2006, p. 104)
- 61 (Consumer Institute of New Zealand, 1998)
- 62 (Whitby Lakes Retirement Village, 2011, p. 2)
- 63 (Whitby Lakes Retirement Village, 2011, p. 2) *For Whitby Villages, this fee is calculated on a monthly basis at 6.25% per year for 4 years to a maximum of 25%. Therefore if one was to purchase a licence to occupy for \$360,000, and decides to terminate the agreement after 4 years, the Village contribution is 25% of the original purchase price, thus the contribution is \$90,000, and the occupant receives only \$270,000 of their initial \$360,000 investment.*
- 64 (Taylor, 2011)
- 65 *It is projected that between 2001-2051 an additional 87,800 will require residential care. 73% of whom will be in the 85 plus group.* (Davey, Joux, Nana, & Arcus, 2004, p. 116)
- 66 (Kiata-Holland, 2010, p. 2)
- 67 (Kiata-Holland, 2010, p. 2)
- 68 (Kiata-Holland, 2010, p. 7)
- 69 (Lipman & Slater, 1977)
- 70 (Haber, 2009, p. 290)
- 71 (Lipman & Slater, 1977, p. 279)
- 72 (Kearns & Andrews, 2005)
- 73 (Laws, 1995, p. 256)
- 74 (Davey, Joux, Nana, & Arcus, 2004, p. 170)
- 75 (Herwig, 2008, p. 34)
- 76 (Rosenfeld & Chapman, 2008, p. 5)
- 77 (Kinzelbach, 2011)
- 78 (Saville-Smith, 1993, p. 76)
- 79 (Schwarz, 1999, p. 279)
- 80 (Moody, 1998, p. 25)
- 81 (Myerson, 2011, p. 93)
- 82 (Durrett, 2009, p. 16)
- 83 (Lipman & Slater, 1977, p. 278)
- 84 (Kinzelbach, 2011, p. 13)
- 85 (Foucault, 1995, p. 200)
- 86 (Adams, 2009, p. xiii)
- 87 (Shield, 1988, p. 24)
- 88 (Maass, Ilaria Merici, Furlani, Gaburro, Getrevi, & Masserini, 2006, p. 682)
- 89 (Robinson & Thompson, 1999, p. 253)
- 90 (Kinzelbach, 2011, p. 13)
- 91 (C. T. Onions, 1972)
- 92 (Durrett, 2009, p. 10)
- 93 (Lipman & Slater, 1977, p. 281)
- 94 (Kinzelbach, 2011, p. 13)
- 95 (Davey, Joux, Nana, & Arcus, 2004, p. 100)
- 96 (Arons & Gelauff, 2011, p. 153)
- 97 (Kiata-Holland, 2010, p. 25)
- 98 (http://www.athomecare.co.nz/going_into_care.html)
- 99 (Clement, 2012)
- 100 (Clement, 2012)
- 101 (Wheelwright, 2012, p. 47)
- 102 (Rashbrooke, 2009, p. 15)
- 103 (Olsberg, Perry, Encel, & Adorjany, 2004, p. Glossary)
- 104 (Statistics New Zealand, 2007)
- 105 (Davey J. , 2006, p. 129)
- 106 (Davey, Joux, Nana, & Arcus, 2004, p. 20)

107	(Davey J. , Housing for Ageing New Zealanders, 2008, p. 42)	153	(Herwig, 2008, p. 21)
108	(New Zealand Government, 2002; Davey, Joux, Nana, & Arcus, 2004, p. 21)	154	(Grant B. C., 2006, p. 103)
109	(Davey J. , Housing for Ageing New Zealanders, 2008, p. 42)	155	(Davey, Joux, Nana, & Arcus, 2004, p. 14)
110	(Davey, Joux, Nana, & Arcus, 2004, p. 14)		
111	(Saville-Smith, James, Warren, & Coleman, July 2009, p. i)		
112	<i>Typologies of interest are those standalone dwellings which comprise more than 2% of today's building stock. Those typologies which illustrate high levels of variability, or are multi-unit dwellings are not explored in this study. This includes the 34,000 pre-1960 multi-unit dwellings; the 28,000 apartment dwellings built in the 2000's; the 18,000 Art Deco homes; 133,000 Multi unit housing built between 1960-1970 and New Zealand's Baches.</i>		
113	(Statistics New Zealand, Dwelling and Household Estimates, 2011)		
114	No figures, studies, or statistics currently exist to confirm the estimations that about 5% of New Zealand homes have had architects involved in the design. However in communication with New Zealand Institute of Architects Chief Executive, Beverly McRae estimated that it may be as much as 7%.		
115	(Beacon Pathway Ltd, 2003, p. 10)		
116	(Building Research Association of New Zealand, 2012)		
117	(Beacon Pathway Ltd, 2003, p. 10)		
118	(Beacon Pathway Ltd, 2003, p. 10)		
119	(Dudding, 2010)		
120	(Beacon Pathway Ltd, 2003, p. 10)		
121	(Beacon Pathway Ltd, 2003, p. 38)		
122	(Davey J. , 2006, p. 128)		
123	(Statistics New Zealand, 2006 Census: Quickstats About Housing, 2007, p. 3) In 2006, there were 1,125,732 separate houses (giving storey information) 261,852 or 23.2% had two or more storeys. Of the 248,634, 97,845 or 39.35% of joined together dwellings (flats, units, apartments, and townhouses) are two storeys or more.		
124	(O'Toole, 2005, p. 2).		
125	(Greenbrook, 2005, p. 23)		
126	(Dudding, 2010)		
127	(Greenbrook, 2005, p. 2)		
128	(Schriener & Kephart, 2010, p. 15)		
129	(Howden-Chapman, et al., 2005, p. 2601)		
130	(O'Toole, 2005, p. 3)		
131	(Beacon Pathway Ltd, 2003, p. 12)		
132	(Imrie, 2006, p. 26)		
133	(Imrie, 2006, p. 26)		
134	(Livingston, 2000, p. 184)		
135	(Smets, 2009, p. 269)		
136	(Livingston, 2000, p. 183)		
137	(Livingston, 2000, p. 183)		
138	(Livingston, 2000, p. 184)		
139	requires buildings to which the public are admitted to have reasonable and adequate facilities for disabled people to visit, work, and carry out normal activities there		
140			
141	(Davey J. , Housing for Ageing New Zealanders, 2008, p. 43)		
142	(Howden-Chapman, Signal, & Crane., Housing and health in Older people: Ageing in Place, 1999, p. 18)		
143	(Smith S. , 1989)		
144	(Howden-Chapman, et al., 2005, p. 2601)		
145	(Ryan, Burgess, & Easton, 2008, pp. 26-27)		
146	(Clark, Jones, & Page, 2005, p. 49) Findings from BRANZ's 2005 House Condition Survey, conducted on 550 homes.		
147	(Kohler, 2011)		
148	(Ryan, Burgess, & Easton, 2008, pp. 34-36)		
149	(Howden-Chapman, et al., 2005, p. 2601)		
150	(Howden-Chapman, et al., 2005, p. 2601)		
151	(Davey J. , 2006, p. 130)		
152	(Olsberg, Perry, Encel, & Adorjany, 2004, p. ii)		

CHAPTER 5.0:

THE SEARCH FOR AN ALTERNATE LIVING MODEL.

The previous chapter illustrated the inadequacies of the three main living models for older New Zealanders and concluded that in the future New Zealand context, alternative architectural responses are required. In an attempt to identify more appropriately suited architectural models for New Zealand's ageing population this section explores the alternative, unconventional, and lesser known architectural proposals.

REACTIVE RESPONSES **(1)** AND PROACTIVE APPROACHES **(2)**.

These alternative models are split and categorised into one of two categories; Reactive and Proactive responses. A reactive architectural model is one which reacts in response to problems *as and after* they occur.¹ Proactive approaches, conversely, are those architectural environments which attempt to provide environments which minimise the impact of diminishments which occur with progressive age *before* they occur. Both options have their merits and challenges.

1. REACTIVE RESPONSES

Living models which are categorised as reactive architectural responses are those which are purpose built to provide accommodation options as a reaction to an ageing individual's diminishment of physical or cognitive capacity.² These architectural typologies are often sought by individuals or family members only after an accident or event which functions as a catalyst for the realisation that the existing home environment is not appropriate for their needs.

A. NEW FORMS OF INSTITUTIONS- EXTRA CARE HOUSING

The aforementioned Rest home typology is a prime example of a reactive architectural response to the physical and mental diminishments of the elderly. Critics of these rest homes have long called for the need to develop institutional arrangements that are more responsive to human dignity than mass long-term care facilities.³ This has resulted in the emergence of an array of variations of the Rest home typology, known as Extra care Housing. These alternatives which include, Eden alternative, Green houses, and Abbeyfield Houses, Floating institutions and High Density inner city apartments for the elderly attempt to resolve architectural and programmatic deficiencies which are common in the current Rest Home typology.

A1: THE EDEN ALTERNATIVE

Loneliness, boredom and helplessness are common issues within archetypal Rest homes, and in the early 1990's, the Eden Alternative emerged with a key goal of changing the culture and guiding principles within rest homes.⁴ This Eden alternative encourages practices such as enabling visiting children and grandchildren, live-in pets, and planting as methods to transform large institutional settings into more humanised homely environments.⁵ [Fig 118 & 119] This approach deals with the programmatic and management issues of institutions, and not so much focus is placed on the architectural deficiencies inherent to institutions, therefore holds few architectural lessons. However one consideration this alternative illustrates as fundamental is the importance of providing residents with the same rights that one receives when part of regular society. This is an important determinant to ensuring residents age with dignity.

Figs 118 & 119: Eden Alternative encourages pets, planting and family visiting to minimise the institutional

A.2: GREEN HOUSES

The Green House Project is an alternative architectural typology which replaces the traditional institutional approach to nursing-home design. In these facilities residents live in smaller, homelike clusters,⁶ which function as a service provision hub for older people living in the community.⁷ These places provide short term, respite and convalescent care if required and focus is placed on independence and rehabilitation, with care givers working with, not for, the residents.⁸ Residents get involved in selecting the colour that their room will be painted and are consulted about the choice and placement of furniture in their rooms. The architecture of this typology has significant impacts of the residents. The scale of the individual residences is reminiscent of a typical home as opposed to the large hospital like infrastructure found in archetypal rest homes and this has significant benefits on the psychological health of the ageing inhabitant.

Fig 120: Concept imagery illustrates the residential scale of the Green House Project.

A.3: ABBEYFIELD HOUSES

The Abbeyfield House concept is another architectural alternative to the archetypal institution. This concept emerged in England in 1956, and provides affordable, quality rental housing on a communal living basis. This community-funded alternative model requires no capital contribution for entry (unlike all other age restricted living arrangements), and provides affordable family style housing for older people who tend to be alone, with low incomes and limited assets. These houses tend to be located within suburban areas [Fig 122], and these homes retain a residential scale [Fig 121] which enables them to be part of the community. Typically between 8-10 residents have their own room with a bed, an en suite, small living area, and basic cooking facilities [Fig 123]. These individual rooms surround shared communal facilities including kitchen, laundry, garden, dining and sitting rooms. Each house has a house keeper responsible for shopping, management and preparation of two meals a day.⁹ There are also guest rooms which allow family to stay. This living model illustrates the benefits of an architectural model which clusters small groups of vulnerable elderly together to maximise service provision, whilst retaining a home like scale which is often lost within conventional institutions.

Fig 121: Street view of Abbeyfield in the suburb of Sandringham, Auckland, illustrates residential scale used.

Fig 122: Aerial perspective of an Abbeyfield House illustrates the residential context in which the house sits in the suburb of Sandringham in Auckland.

Fig 123: Plan of typical room for an individual in and Abbeyfield House.

A.4: FLOATING INSTITUTIONS

A relatively extreme proposal for an alternative living model to the archetypal institution, receiving international attention is the floating institution for older people [Fig 124]. These floating assisted living facilities would specialise in long term care¹⁰ and enable many elderly to fulfil their desire to travel during their retirement years. Although only a proposal, this living option is likely to be at the premium end of the market, which would limit this living option to only those with the financial means. This form of development is contradictory to the concept of Ageing in place as it requires a complete upheaval of life, and removal from the familiarity of neighbourhoods and communities. The confined nature of this type of living arrangement has the potential to increase isolation and dependence, rather than promoting independence.

Fig 124: Proposal for a floating Institution for the elderly.

A.5: INNER CITY HIGH DENSITY ELDERLY HOUSING

Internationally there is an emerging trend of elderly accommodation provision within urban centres. High density, high-rise accommodation blocks are an emerging approach being pushed by regional authorities, to provide high quality, high density housing in urban areas for a growing portion of the population.

The benefits of this type of living model include the proximity to amenities and activities associated with urban centres. These types of developments are emerging in many European cities, in The Netherlands in particular [Fig 125, 126, 127, 128, 129, 130 & 131]. These cities have a history of inner city living, and high population densities. The same thing cannot be said of New Zealand's urban centres. The development patterns of New Zealand's cities have been influenced significantly by the American models of Suburbs, and it is clear that suburban living, and the promise of a standalone house with a garden is more sought after than inner city living in New Zealand. Although these variations of the archetypal Rest homes living models have many benefits, they also all still have many of the deficiencies of the rest home model. They group the elderly together. This social homogeneity caused by grouping the same aged, socio-economic, and cultural groups has been critiqued as causing unnatural forms of community.

These alternative proposals also require the complete upheaval of the occupant into a new environment. This move can be detrimental to both psychological and physiological health.

It is for these reasons that this living model have not been selected for further exploration in the context of this thesis.

Fig 125: Plan of typical floor in de Plussenburgh in Rotterdam, Netherlands, by Arons en Gelauff Architects

Fig 126: Perspective of de Plussenburgh, in Rotterdam, Netherlands, by Arons en Gelauff Architects illustrates the urban context in which this housing sits.

Fig 127: Typical floor in De Rokade in Groningen, Netherlands, by Arons en Gelauff Architects.

Fig 128: Perspective of De Rokade in Groningen, Netherlands, by Arons en Gelauff Architects.

Fig 129: Perspective of De Rokade in Groningen, Netherlands, by Arons en Gelauff Architects.

Fig 130: Perspective of WoZoCo in Amsterdam, Netherlands, by MVRDV

Fig 131: Perspective of WoZoCo in Amsterdam, Netherlands, by MVRDV

B. NEW FORMS OF RETIREMENT VILLAGES

There are an array of living models emerging which attempt to provide alternatives to the traditional concepts of the retirement village.

B.1: MULTI LEVEL COMMUNITIES.

Retirement communities emerging in the 21st century are adapting to the changing lifestyles of today's older people. Operators such as Ryman and Summerset, have seen the potential of diversifying the living types their communities provide for older people. These new forms of retirement communities incorporate various levels of housing to cater for the various life stages that people are in. In these places residents can choose from varying levels of care depending on their individual requirements. From independent villas [Fig 135] for those with very few health issues, to assisted care apartments [Fig 134] for those requiring aid in some form or another, through to smaller health focussed rooms [Fig 133] for those requiring semi-permanent nursing attention. Although these appear to be progressive and forward thinking variations of retirement communities, they do still share many of the architectural and programmatic deficiencies identified in the retirement village case study, such as being isolative privatised communities, with an in-built homogeneity.

Fig 132: Assisted care apartments Summerset Retirement community in Aotea, Wellington.

Fig 133: Hospital care apartments at Summerset Retirement community in Aotea, Wellington.

Fig 134: Assisted care apartments at Summerset Retirement community in Aotea, Wellington.

Fig 135: Conjoined independent villas at Summerset Retirement community in Aotea, Wellington.

B.2: NATURALLY OCCURRING RETIREMENT COMMUNITIES

Naturally occurring retirement communities, otherwise known as NORC's, are becoming increasingly prevalent internationally as a result of more elderly people ageing in their homes, whether by choice or due to a financial inability to relocate after retirement.¹¹

This type of unintentional development occurs naturally over time as a large group of people age at the same time, resulting in entire neighbourhoods and communities predominantly consisting of older people. The unpremeditated collection of many older people in a close geographic area has resulted in service provision for elderly becoming more economically accessible to many. These NORC's illustrate the potential of built environments which enable people to age in place, however, are very difficult to plan and do not have common architectural characteristics, and is therefore not continued for further exploration in the context of this research.

C. RETROFITTING REACTIVELY

As age increases, capabilities diminish and events such as health scares and falls become more common. When these events occur, they can illustrate the deficiencies of many home environments in catering to the requirements of those ageing citizens. These events function as the catalyst for many to retrofit their home to make them more age appropriate. These types of retrofits are usually undertaken by Certified Ageing-In-Place Specialists who have geriatric and medical perspectives,¹²

with the objective of creating home environments which focus on further accident prevention and rehabilitation.¹³ Common modifications include widening of doors, the addition of wheelchair ramps, stair lifts, drop down shower seats, interior and exterior hand railing, ceiling track hoists, lowering and enlarging of light switches [Figs 26-32]. The focus of these modifications deal with the problems of ageing after they have occurred, with the focus on minimising further health risks to the inhabitant. As these retrofits are so medically driven, the interventions tend to be purely functional resulting in crude, tacked on functional interventions which visually express the residents deficiencies. This can lead to stigmatisation of the inhabitant as vulnerable.

CONCLUSION OF REACTIVE RESPONSES

These reactive approaches have been, and would continue to be popular among the existing elderly cohort consisting of the Silent Generation, however as the baby boomers age, even these alternative models illustrate an array of deficiencies in dealing with the requirements of this new aged cohort. The reactive responses discussed all have limitations. These alternative living options require large amounts of financial investment to be realised, limiting these solutions to the select few who can afford them. These options often result in either homogeneous architectural responses or in medically focussed built environments, specialising in care provision which stigmatises residents as frail elders. In conclusion, it illustrates the significance of exploring less conventional approaches to dealing

with the ageing process in a proactive manner.

2. PROACTIVE APPROACHES

Architectural models which take a proactive approach are those which take deliberate and premeditative action in anticipation of future problems associated with the potential changes in physical and cognitive capabilities accompanying age. The author suggests that it is these proactive approaches which hold the greatest potential for developing appropriate housing environments in a future New Zealand context with the changing composition of an ageing population.

A. BUILDING NEW

A great opportunity to take a proactive approach is to incorporate architectural features into the home environment when a new home is built. The Lifemark Initiative is a holistic method of future proofing at the point of building,¹⁴ and an example of how New Zealand's housing sector is responding to the need for homes to be more inclusive of and accessible for members of New Zealand's society undergoing diminishments of old age. Lifemark is a seal of approval which is awarded to homes which incorporate the 5 guiding principles of usability, adaptability, accessibility, inclusion and lifetime value.¹⁵ These principals are credited with enabling residents to live in safe and comfortable¹⁶ homes for a lifetime.¹⁷ In 2009, 276 Lifemark approved homes were under construction.¹⁸ This initiative promotes subtle

architectural considerations including; flat level entrances, provision of all living spaces on entry level, wide doorways and generously sized spaces for access, doors handles and light switches at convenient heights, slip resistant floor finishes,

Fig 136: The Lifemark Initiative is an example of incorporating design elements at the building stage, which aid the elderly to remain in their homes as they age

and strengthened walls to enable railings and shower seats if required.

Building new homes also enables the incorporation of technologies which can allow elderly people to live independently in their own homes for as long as possible.¹⁹ Examples of Technology Innovation for the Disabled and Elderly people (T.I.D.E) exist in many new homes specifically designed for the elderly. These include installing electronic sensors connected to a computer which reminds people to take their medicine or turn off the oven.²⁰ These advances can aid the occupant in automating heating and lighting, opening of doors and windows, and remotely controlling taps and central locking.²¹

Implementing certain architectural elements into built environments with the aim of minimising detrimental psychological and physiological effects prior to any diminishment or impairments of old age occurring, is a proactive approach. These environments take premeditative action, minimising any potential risks to elderly occupants to enable more people to remain in their home, and increase the number of homes which will allow the resident to age in place with dignity.

The benefits of building new are quite apparent, however the requirement of a new site and new home, demand a significant financial investment. As a result, in its current form, this “building new” type of development is limited to those few individuals at the premium end of the market, and unattainable for many ageing New Zealanders. The author sees this model as having significant potential in New Zealand’s future, and believes that a more accessible and affordable solution is required. Design Exploration 3 in chapter 6 proposes a “build new” living type which examines the benefits, limitations and viability of this “new build’ living model in a future New Zealand context.

A.1: SENIOR CO-HOUSING COMMUNITIES

Rosenfeld and Chapman suggest the ageing population is “creating new forms of community.”²² A prime example of these new forms of community gaining traction internationally, is the concept of self-developed Senior Co-housing communities. This alternative living model consists of small clusters of friends and neighbours²³ who build and own their own dwellings, which are clustered around common or shared facilities and amenities for which expenses are shared. This arrangement promotes shared governance, bringing people together on a daily basis²⁴ as well as enabling privacy and autonomy.²⁵ This model seems especially popular among elderly whose children have moved, friends have died, or whose spouses are infirmed or non-existent.²⁶ This model is expected to gain significant traction among ageing Baby boomers as this generation’s mythology already includes communes and college dormitories.²⁷ This alternative architectural model has potential in providing appropriate high quality living environments for New Zealand’s elderly; however

Fig 137: Panorama of Egebakken senior co-housing community by Vandkunsten Architects in Denmark. This illustrates the clustering of conjoined dwellings around a shared community central hub (black building).

Fig 138: Aerial plan of Egebakken senior co-housing community in Denmark by Vandkunsten Architects. This illustrates the clustering of conjoined dwellings around a shared community central hub.

this model also shared many deficiencies identified in traditional retirement village settings. Although these communities are self-developed and autonomously run, these communities inevitably result in social homogeneity, as inhabitants of similar ages, races, and financial situations often band together. Because this form of developments requires both a fresh site and new homes to be built, senior co-housing is often restricted to those at the premium end of the market who can afford the significant capital investment required. Most cohousing communities result in built environments which are often homogeneous and repetitive for spatial and financial efficiency. This can limit the resident's opportunity to express their own individuality through the medium of their home.

B. INTERGENERATIONAL LIVING ARRANGEMENTS.

The once common scenario of frail older people moving in with close family as they aged became increasingly rare throughout most developed countries in the late 20th century.²⁸ The emergence of purpose built elderly communities, changing family dynamics²⁹ and the fear older people had about becoming a burden on their family³⁰ lead to intergenerational living arrangements falling out of favour. However in the early 21st century intergenerational living arrangements are re-emerging as viable living options for those ageing people who understand the social and economic benefits of such arrangements. Two distinct intergenerational living arrangements exist.

The first such living arrangement is the granny flat concept, whereby elderly family members live with younger family members in a secondary dwelling in the form of either a standalone dwelling on the same property or within the existing built envelope. This arrangement enables the ageing family member to remain involved in aspects of their family's lives.³¹

The second arrangement is intergenerational home sharing. This concept sees single elderly people matched with a younger person who moves in to live rent free, in exchange for between 8-10 hours of services including cooking meals, and help cleaning up each week. This forms a mutually beneficial relationship where help and company are afforded in exchange for free accommodation. These two living arrangements allow people to age in place, avoid institutionalisation and remain independent

for as long as possible. These types of living arrangements often require building works to be undertaken to enable the elderly person undergoing diminishments to continue to live there. This can most effectively be achieved via a proactive retrofit.

C. RETROFITTING PROACTIVELY

Most residential retrofits in New Zealand are undertaken to increase floor area, stylistically modernize or improve energy efficiency of homes. Few retrofits occur with the purpose of providing improved home environments for ageing inhabitants undergoing diminishments associated with old age. Of the few that do, the majority often occur as reactive responses to health scares of elderly occupants and result in crude, poorly considered interventions. A proactive retrofit of an existing built environment takes premeditative action to minimise shortcomings of the built environment for ageing occupants.

This approach retrofits existing housing stock, incorporating design principals and architectural features which “focus on changes that last a lifetime.”³² These retrofits create environments which work for people of all ages and abilities,³³ and incorporate architectural design principals which enable an individual to remain in their home environment as they age.

This is a relatively uncommon approach at present, but is one which holds significant potential in New Zealand’s future context of an ageing population.

This holistic approach to elderly residential accommodation is more attainable by more ageing New Zealanders therefore holds greater potential than other alternatives which are limited only to the premium end of the market.

It is important to note that housing tenure is a limitation to this approach as the ability to modify existing dwellings is dependent on home ownership.³⁴ Fortunately, because home ownership is a highly favoured saving vehicle,³⁵ New Zealand has very high rate of ownership without debt among baby boomers entering their 60’s³⁶ indicating that housing tenure is not expected to be a significant constraint to this approach becoming widely utilised in the future. Literature suggests that “it may be more economical to renovate existing housing than to build specialised housing for older people”³⁷ and that “improvements of the existing housing stock are a more effective use of the housing budget than special purpose housing construction.”³⁸

This alternative approach proposes a solution to the common issue of older people being asset rich but income poor. Equity release schemes such as reverse mortgages, allow elderly home owners to use an unencumbered house as an asset against which a loan can be raised.³⁹ This provides “funds for older homeowners to renovate, adapt or repair their houses to provide a better quality of life and guard against the risk to health.”⁴⁰

Housing models which proactively retrofit, support older people to remain living in their own home within the community and will produce significant fiscal benefits.⁴¹ They can enable elderly

to utilise their housing asset to provide a source of income,⁴² by renting space which is not required to others.

CONCLUSION OF PROACTIVE RESPONSES

These proactive architectural responses seem to propose more effective solutions to the issues associated with New Zealand's ageing population. The solutions are more accessible, viable and are expected to result in better built environments. The following chapter explores three proposed architectural explorations, each of which is categorised as a proactive architectural response. Design Exploration 1 and Exploration 2 apply proactive retrofits to two of New Zealand's most common housing typologies. Design Exploration 3 applies the build new model to the new Zealand suburban context. Each of the explorations illustrates the financial and architectural viability, strengths and the limitations of each approach in New Zealand's future context.

(Endnotes)

- 1 (Phillips, 2000, p. 679)
- 2 (Rosenfeld & Chapman, 2008, p. xxvii)
- 3 (Moody, 1998, p. 21)
- 4 (Haber, 2009, p. 290)
- 5 (Haber, 2009, p. 291)
- 6 (Rosenfeld & Chapman, 2008, p. xxv)
- 7 (Davey, Joux, Nana, & Arcus, 2004, p. 148)
- 8 (Davey, Joux, Nana, & Arcus, 2004, p. 102)
- 9 (Davey, Joux, Nana, & Arcus, 2004, pp. 64, 96)
- 10 (Rosenfeld & Chapman, 2008, p. xxviii)
- 11 (C-Lab, 2011, p. 35)
- 12 (Rosenfeld & Chapman, 2008, p. 3)
- 13 (Rosenfeld & Chapman, 2008, p. 5)
- 14 (Rashbrooke, 2009, p. 7)
- 15 (Saville-Smith K., 2008, p. 36)
- 16 (Davey J., Housing for Ageing New Zealanders, 2008, p. 43)
- 17 (Rosenfeld & Chapman, 2008, p. xvii)
- 18 (Rashbrooke, 2009, p. 4)
- 19 (Rosenfeld & Chapman, 2008, p. 9)
- 20 (Davey, Joux, Nana, & Arcus, 2004, p. 83)
- 21 (Davey, Joux, Nana, & Arcus, 2004, p. 143)
- 22 (Rosenfeld & Chapman, 2008, p. xiii)
- 23 (Davey, Joux, Nana, & Arcus, 2004, p. 90) quoting (Brenton, 2001)
- 24 (Schriener & Kephart, 2010, p. 5)
- 25 (Thomas, 2009, p. x)
- 26 (Durrett, 2009, p. 16)
- 27 (Brown, 2006)
- 28 (Davey J., 2006, p. 129)
- 29 (Rosenfeld & Chapman, 2008, p. xvi) "Older people cannot necessarily turn to their children for care and shelter."
- 30 (Rosenfeld & Chapman, 2008, p. xxi)
- 31 (Dunster, 1986)
- 32 (Rosenfeld & Chapman, 2008, p. 3)
- 33 (Rosenfeld & Chapman, 2008, p. 3)
- 34 (Bridge, Phibbs, Kendig, Mathews, & Cooper, 2008)
- 35 (Davey, Joux, Nana, & Arcus, 2004, p. 136)
- 36 (Thorns, 2011, pp. 11-12)
- 37 (Davey, Joux, Nana, & Arcus, 2004, p. 14)
- 38 (OECD, Ageing, Housing and Urban Development, 2003, p. 202)
- 39 (Howden-Chapman, Signal, & Crane., Housing and health in Older people: Ageing in Place, 1999, p. 21)
- 40 (Davey, Joux, Nana, & Arcus, 2004, p. 135)
- 41 (Davey, Joux, Nana, & Arcus, 2004, p. 12)
- 42 (Olsberg, Perry, Encel, & Adorjany, 2004, p. v)

CHAPTER 6:

DISCUSSION OF 3 DESIGN EXPLORATIONS

In chapter five, the multitude of architectural options which exist or which are proposed to deal with the ageing population were explored. It was concluded that very few architectural models exist to cater to the requirements of the changing composition of New Zealand's ageing population to enable them to age with dignity.

The architectural component of the thesis is the exploration of three proposed alternative architectural solutions. These three explorations take into consideration the social, political, environmental and economic conditions which are expected to shape future contexts within which these proposals will occur.

Across all three design explorations, the same architectural methods, mechanisms and spatial techniques, illustrated in the architectural framework (Chapter 3), are applied to three distinct and separate scenarios to examine the viability of these architectural innovations in providing successful housing alternatives which enable dignity.

All three design explorations are proactive responses and each attempts to enable ageing in place. This is seen as the most effective method to enabling ageing with dignity for New Zealand's ageing cohort.

The first two design explorations emerge in response to the high home ownership rates among New Zealand's Baby boomers. These explorations investigate the viability of proactively retrofitting two archetypal examples of the most common

residential housing typologies within contemporary New Zealand society. The first design exploration is the proactive retrofit of an existing archetypal 1930's State house. The second design demonstrates a proactive retrofit of an existing typical 1990's "McMansion" suburban home.

The aim of these first two explorations is to illustrate that with certain architectural interventions, existing housing stock can be re-appropriated to cater to requirements of the ageing population to allow a person to age in place, and with dignity. As each of these typologies follow certain architectural and programmatic characteristics, and provided the retrofit process is effective, the vision is that this process could be applied to a significant number of dwellings within New Zealand.

The third design exploration is the proposal of a medium density cluster of dwellings within a typical suburban environment. This exploration emerged from the understanding that new homes will inevitably continue to get built, and that the design of these new homes can have a marked and positive impact on the viability of elderly members in society remaining in their homes.

DESIGN EXPLORATION 1-STATE HOUSE RETROFIT

The first exploration is a proactive retrofit of an archetypal state house. The house selected for retrofit, was 118 Main Road, Titahi Bay, Wellington [Figs 139 & 141], as this house demonstrated many of the common characteristics of this typology.

Located in a suburb typical of the development patterns between 1930-1960, this single storeyed, square planned house has an 85m² footprint and sits on a 702 m² lot.

The house itself sits off-centre and toward the front of the site, and is orientated toward the north for sunlight. A concrete tiled 32° pitch hipped roof covers the home which has a narrow central corridor, with all services grouped together located toward the rear of the dwelling. The façade has limited ornamentation, is clad with large scale weatherboards with small single glazed timber windows. Raised recessed front and rear porches are the entry and exit points of the house which has two bedrooms, one bathroom, and one living area [Figs 140, 142, 143, 144].

Fig 139: Aerial perspective illustrating the context and location of the existing house; 118 Main Road, Titahi Bay, Wellington.

NORTH ELEVATION

EAST ELEVATION

Fig 140: Elevations of 118 Main Road, Titahi Bay, Wellington illustrates external characteristics which are typical of State houses.

Fig 141: Aerial perspective illustrating the context and location of the existing house at 118 Main Road, Titahi Bay, Wellington.

Fig 142: 118 Main Road, Titahi Bay, Wellington illustrates external characteristics which are typical of State houses.

SOUTH ELEVATION

WEST ELEVATION

Fig 143: Spatial layout of 118 Main Road, Titahi Bay, Wellington illustrates internal characteristics which are typical of State houses.

Fig 144: Axonometric perspective illustrates the spatial layout of 118 Main Road, Titahi Bay, Wellington and internal characteristics which are typical of State houses.

The aim of this design exploration is to illustrate how this typical state house could be re-appropriated to enable New Zealanders to remain living in their own homes in their communities, as they age. The scenario for this exploration comprises of an ageing baby boomer couple who own the state house, and are considering downsizing. Typically, downsizing would result in a move to a smaller home in a different location. However this alternate architectural solution proposes that the house be subdivided into two smaller dwellings on two smaller lots. This enables the occupants to age in place, to continue residing in a familiar area and location, whilst also upgrading and spatially downsizing their home. The two proposed dwellings, which would be relatively even in area would enable a multitude of lifestyle opportunities for the owners. The first opportunity this enables is the option to sell the second dwelling. This could be sold to another ageing couple as their retirement home, or to younger buyers, as their first home on the housing ladder. This would be a viable method of releasing equity within the home, resulting in a significant one-off financial return for the owners.

The second opportunity this proposal enables is the option to rent out the second dwelling which would ensure an on-going income through retirement. As the owners retain ownership of the homes, this option also enables the occupant to provide a residence for a “live in” carer if required later down the track, enabling the occupants to age in place and remain in their home for as long as possible.

DESIGN DECISIONS

The aim of this design is to demonstrate the viability of retrofitting this typology. The retrofit process is explained through an exploration of the significant design decisions.

DESIGN DECISION ONE:

The first design decision involved selecting which approach to take on subdividing the existing built envelope and site, as well as the location and size of additional building work. The common factors within each of the options include the size of the overall site, which does not change, and the retention of and building around the existing built envelope. There were a range of subdivision options [Fig 145] each of which had their own positive and negative attributes.

Option A, which centrally divides the site and dwellings, was selected as the subdivision option to proceed with for the reason that it enabled street access and front and back yards for each dwelling. It also enabled each of the two dwellings to have equal standing on the street façade as opposed to other options which would have had one dwelling seen from the street.

Fig 144: Multitude of subdivision and addition options of the site and existing dwelling

DESIGN DECISION TWO:

The next design decision was to determine how much of the existing built environment would be maintained. In order to encourage affordability, and to maximise the viability of this living option, as much as possible of the existing built environment is maintained. The spatial arrangement and location of significant amenities and architectural features within the existing house [Fig 145] have a significant influence on the proposed spatial arrangement and relationship of the two new dwellings. The toilet, bathroom vanity and kitchen sink outlet locations [A - Fig 145] of the original home are retained and function as pivot points from which to inform the new dwelling's spatial arrangements. The kitchen outlet of the original home becomes the kitchen outlet for Dwelling One. The bathroom outlets are utilised in the en suite bathroom to the bedroom in Dwelling Two. The existing chimney outlet [B - Fig 145] becomes the extractor fan outlet location, and influences the location of the kitchen in Dwelling Two. The location the existing entrance [C - Fig 145] is retained and functions as the front door into Dwelling two. The existing windows [D - Fig 145] are retained, and the lintel over the existing rear bedroom window [F - Fig 145] , is used as the lintel for a new rear access door for dwelling two. The existing roof structure is maintained and extended from the existing hipped gable, to incorporate two prominent gables which function to differentiate the two dwellings.

DESIGN DECISION THREE:

The third significant design decision is the arrangement of the spaces within both dwellings. This required understanding the necessary spaces required for an ageing couple. This design process focusses on providing spaces to enable multiple living activities to occur within each of the dwellings, as opposed to strictly designating a specific room to an activity. The dwellings must provide ample space for activities which include eating, sleeping, dressing, bathing, resting, cooking, relaxing, entertaining, and working. These are the drivers of the spatial arrangement of the house.

A key intention of this retrofit is to maximise affordability, and small footprints and efficient spatial layout are imperative to fulfil this goal. Each of the dwellings intentionally have relatively small foot prints, dwelling One with 52 m² and dwelling Two with 56m² [Fig 146]. The decision to use an open plan living arrangement is significant, as this arrangement maximises usable space and allows multiple activities to be undertaken within the same area.

Fig 145: Retained elements, which are used as pivot points in the spatial arrangements of the two proposed dwellings

Fig 146: Area and spatial arrangement of Dwelling 1, and Dwelling 2.

Each dwelling is broken down into three main parts; primary, secondary and tertiary [Figs 147 & 148]. Each of these parts caters to different living activities and provides a different level of privacy. The primary (Red) is the largest space at 33m² in Dwelling One, and 36m² in Dwelling Two. This space is the most public of the areas, and provides space for cooking, preparation, eating, entertaining, relaxing, and working. This zone is accessed directly from the front door and from this space one can move into the secondary space. At 13 m² in both Dwelling One and Two, the secondary space (blue) provides space for sleeping, dressing and relaxing. This space is located toward the rear of each of the dwellings. Within this area sits a bed, a shelving unit (which functions as storage and as a separation mechanism) between the dressing space and the sleeping space. From here the rear balcony and garden are accessed. The 6m² tertiary space (Yellow) is the smallest of the areas, and provides room for cleansing. This room houses a toilet, a vanity, a flat entry shower and laundry facilities. Due to the activities which occur within these areas, it is the most private space of the dwelling.

Fig 147: Diagram of spatial relationships between the Primary, Secondary & Tertiary zones within Dwelling 1

Fig 148: Diagram of spatial relationships between the Primary, Secondary & Tertiary zones within Dwelling 2

DESIGN DECISION FOUR:

The fourth design decision is to incorporate the architectural mechanisms and spatial techniques which enable the seven conditions of dignity to be enabled. These innovations are the architectural features which directly impact the degree to which people are able to age with dignity within their home environment. Systematically progressing through the 7 conditions for human dignity in old age, this section illustrates the architectural features which have been incorporated within the design of the retrofitted state house to illustrate how dignity can be maximised in old age within the built environment.

The first condition is capacity. To ensure this is enabled and retained by the occupants, physical barriers to access and circulation must be eliminated, and other architectural features are implemented. The first is to provide all required living areas on one level. This is achieved by extending the footprint of each of the dwellings to provide the space for two dwellings, without the need to add an additional floor above. Dwelling Two protrudes north toward the street, taking the floor area to 56m², whilst Dwelling One extends south toward the rear of the site, taking the floor area to 53m² [Fig 146]. All doors and thresholds within the dwellings are flush, and access ramps are incorporated at the front and to the sides of the dwellings. This ensures access to the dwellings for those with limited mobility to move freely in, out and throughout the home without limitation.

It is vital that these new dwellings are forgiving of error and relieve older people of any deficits they may experience. Architectural features within these new dwellings utilise universal design and incorporate barrier free principals. The first architectural example of this is found in the kitchens of each dwelling. The sink and the bench are devoid of any fixed cabinetry underneath. This means that any occupant limited to a wheelchair can use these elements in the same manner as any other occupant [Figs 149 & 150].

Fig 149: Kitchen space of Dwelling 2 illustrates the universal design principles utilised which enables those with mobility deficiencies to use the space in the same manner as those without deficiencies.

Fig 150: Kitchen space of Dwelling 1 illustrates the universal design principles utilised which enables those with mobility deficiencies to use the space in the same manner as those without deficiencies.

Twistable door knobs are replaced by either levered or long vertical door handles. These elements simplify the door opening action for those with diminishing dexterity, whilst also functioning for able bodied inhabitants [Figs 151 & 152]. The tap levers used in the bathroom and kitchen are levered mixer

taps for the same reason. All internal doors have wide (at least 900mm) openings, are lightweight and slide open and closed. The reason for this is twofold. The sliding doors function as a portion of the wall which enables the occupant to open and close spaces as desired, whilst also making the door opening action as simple as possible for those with diminishing physical capacity and strength.

Fig 151: Contrasting coloured sliding door in Dwelling 2, have wide openings and vertical levers. This enables simple use by those occupants both with and without physical diminishments.

Fig 152: Contrasting coloured sliding door in Dwelling 1, have wide openings and vertical levers. This enables simple use by those occupants both with and without physical diminshments.

A variety of architectural mechanisms are implemented within the interior of these dwellings to maximise legibility for the occupant.

A varied material palette is utilised to indicate spatial changes and to distinguish between the floors, doors, walls and ceiling. The wooden floor boards of the existing home are stripped back and polished in the entrance and living area of each of the dwellings. The secondary space is carpeted to give a sense of comfort and warmth. The areas which receive moisture, in the cooking area and the cleaning area, are clad with large format non-slip stone tiles. The walls maintain the existing plaster work, and this functions as a visual buffer between the wooden floor and the wooden ceiling. The ceiling is clad with horizontally laid wooden boards above the roof structure. The internal doors contrast with the walls to maximise visibility and spatial understanding for the occupant. Each element has a clear identity, which attempts to maximise the occupant's legibility of the space. All furniture and fittings are clearly differentiated from the built environment with contrasting colours and textures. Red is used as an accent colour for the bench top of the kitchen and the room dividing doors, which clearly distinguishes these elements to improve visual perception and aid people in distinguishing between elements. [Figs 153 & 154]

Fig 153: Interior perspective of the living area and kitchen of Dwelling 1 illustrates the varied material palette utilised within the dwelling to maximise legibility.

Fig 154: Interior perspective of the living area and kitchen of Dwelling 2 illustrates the varied material palette utilised within the dwelling to maximise legibility.

The second condition is Self-worth. One architectural method of achieving this is providing dwellings which require little to no maintenance. This is achieved within these dwellings by utilising external roof and wall claddings which are durable, high quality and long lasting [Fig 157]. In the retrofitted dwellings, standing seam metal roofing is utilised. By retaining the high pitch of the roof and utilising this long lasting material means that little patch up work is expected. The large format weatherboards are replaced by vertically (Dwelling Two) and horizontally (Dwelling One) cedar slats in varying widths. This cladding type functions as a weather screen. The material palette utilised requires little maintenance on the part of the occupant and is expected to retain aesthetic and functional integrity for a long period. These materials are used in place of more common place fibre cement or plasterboard cladding and tiled or low pitched roofs.

Another method of maximising self-worth is to celebrate each living activity to maximise quality of life. A variety of architectural elements are included within the dwellings which intend to create architectural experiences which celebrate each living activity. These experiences are influenced by spatial form, natural lighting, and views out. The use of skylights in certain locations [Figs 153-156] maximise natural daylight into the spaces. The bathroom spaces of each dwelling utilise skylights above the showers to allow natural light to stream down onto the occupant when showering, whilst enabling views out [Fig 155 & 156]. This spatial treatment provides a celebration of this living activity for occupants both with and without physical diminishments. Another decision made was to remove the existing 2.7m high ceiling to expose the roof form. This has the effect of opening up the space, increasing the perceived scale of space which are relatively small by floor area. The changing form of the underside of the roof enables a variety of spatial experiences throughout the dwellings [Figs 149, 150, 153, 154, 155 & 156].

Fig 157: External Elevations of the proposed dwellings. The varied treatment of a similar material palette function to aesthetically distinguish between the two dwellings.

Fig 155: Interior perspective of the tertiary space in Dwelling 1, illustrating the light streaming down on the occupants, to create a spatial experience which celebrates the act of bathing by those with and without diminishment.

Fig 156: Interior perspective of the tertiary space in Dwelling 2, illustrating the light streaming down on the occupants, to create a spatial experience which celebrates the act of bathing by those with and without diminishment.

SOUTH ELEVATION

WEST ELEVATION

The third condition is Solitude. One key component necessary within these dwellings is that they ensure privacy and security of the occupant. This is achieved through a variety of architectural mechanisms. The first mechanism is to provide the occupant with progressive levels of privacy which enables the occupant to limit any exposure or vulnerability they may experience. The three zones, Primary, Tertiary and Secondary within each dwelling [Figs 147 & 148] function as three different levels of privacy. The most public; the primary space opens up visually to the street face and is where the entertaining of guests and visitors would occur. The secondary space is more private as the living activities which occur here are more personal. This space is not visible from the public street front and can be closed off from the primary space using a sliding door at any time. The tertiary space is where the occupant is most vulnerable and is the most private of all. This area is not visible from the street at all. At any time the occupant can choose to open and close the doors between these three spaces to control the degree of privacy they experience. Another architectural mechanism used to ensure solitude is the clear definition of thresholds between public and private space. In the place of austere fences to illustrate where the properties begin, a more passive approach is taken. At the threshold of the properties and the public path, the ground material and texture changes. The use of reinforced grass paving at the northern boundary of the site, functions firstly as space for car parking, whilst clearly defining where the public footpath ends and the occupants private property begins. [Fig 160]

Fig 158: Passive surveillance enabled. The occupants of Dwelling 1 are able to see the goings on of the surrounding context.

Fig 159: Passive surveillance enabled. The occupants of Dwelling 2 are able to see the goings on of the surrounding context.

Another element, which functions as a privacy barrier between direct access from the street to the front door, is the access ramp/stair. This element is an amalgamation of four usually separate architectural elements; the ramp, the grab rail, the stair and the planters. This landscaped ramp utilises stacked bonded concrete block as the planter boxes and grab rail elements of the progressing ramp [Figs 160 & 161]. This element creates a visual and physical barrier to the public and the entrance dwellings and enables occupants to view who is approaching the entrances to the dwellings.

It is vital to ensure that the occupants are able to survey passively, both throughout their dwelling and beyond, into the surroundings. The open plan spatial arrangement provides multiple sightlines throughout the dwellings, whilst the high number of windows enables occupants to view what is happening outside, and see who is approaching their dwelling [Figs 158 & 159].

Fig 160: A clear contrast in ground treatment illustrates passively the threshold between private and public areas. The access ramp/stair/planter/grab rail element functions as a physical barrier between the public and the dwellings' entrances ensuring privacy and solitude of the occupant.

Fig 161: North-West Axonometric Perspective of Dwelling 1

Fig 162: South-East Axonometric Perspective of Dwelling 1

Fig 163: North-West Axonometric Perspective of Dwelling 2

Fig 164: South-East Axonometric Perspective of Dwelling 2

The fourth condition is Social Power. It is vital that these dwellings intentionally omit architectural elements which function to communicate the physical shortcomings of those with diminishments. These austere architectural elements [Figs 26-32] can stigmatise the elderly occupants as deviating from conventional function, thus diminishing social power. These dwellings illustrate the importance of integrating design elements which are multi-functional. This integration of multiple uses means that these elements function to different degrees for a range of occupants depending on their requirements. These elements are intended to function just as well for someone experiencing diminishments as those who are not.

Notable examples which are integrated into the design of these two dwellings include the shelves of the bathroom vanity units [Figs 155 & 156]. These are intentionally placed directly next to the toilet. This element doubles as storage space whilst functioning as an integrated physical aid in getting off the toilet if at any time the occupant requires. The dwellings shared entrance element [Fig 160,161 &163] integrates a multitude of functions which enable a range of people to utilise it. This element incorporates a 1:12 1200mm wide wheelchair accessible ramp, with stairs accessible from the North and the East (from both car ports) which can function as seats. The sections of ramp are separated by 800mm high stack bonded concrete block walls which form a lean support/grab rail, if required, whilst also functioning as low level planter boxes.

The seats in the showers are integrated into the built form [Figs 155 & 156], and these elements cater to a range of occupants. For those with mobility diminishments; using wheelchairs or zimmer frames; this seat enables them to sit and shower on their own. For those without diminishments of any kind this seat allows them to sit and experience the shower in a different manner to normal. The ramps at either side of the dwellings [Figs 161-164] accessing the rear balconies are integrated and function in a similar manner for all occupants. For those with mobility diminishments, it enables ease of access, and for all other occupants functions as an alternate entry/exit route [Fig 169].

The fifth condition is Individuality. It is vital that these dwellings enable self-expression of the occupants and limit the chance of objectification and homogenisation of the occupant's living environment. Architectural methods to achieve this include enabling the occupant to dictate how they use the spaces. This has been attempted within these dwellings through the elimination of standardised single use room designations, and the design of polyvalent multi-purpose spaces which allow the occupant to choose to sleep, eat, entertain, read and work in multiple areas. This becomes difficult in a small dwelling, however the utilisation of an open plan living arrangement, the use of shelving units as soft room dividers, and sliding doors which can close and open up space [Figs 151 & 152] allows the occupants of these dwellings maximum control over the way they use their space.

The occupant is able to read on the bed, on the couch, at the kitchen bench, at the work bench or on the dining room table. They could sleep in their bed or on the couch. They can entertain at the dining room table, at the kitchen bench or in the living area. They can eat at the dining room table, the kitchen bench, or in the living area. By enabling a multitude of activities to occur in a range of spaces the individual can determine their own routine and ultimately have control over how they want to live [Figs 165-168].

Another way individuality is maximised is through the built forms of the dwellings themselves. Although it was important that these dwellings were sympathetic to the surrounding neighbourhoods domestic scale (illustrated by the continuation of roof form and the retention of a single level and glazing proportions), it is important to set these dwellings apart from the surrounding context. This is achieved through the application of a material palette which departs from the traditional wall and roof cladding materials. The walls are clad with an unpainted cedar slatted rain screen, cedar weatherboards and the roof with standing seam zinc roofing. This material palette enables the dwellings to be differentiated from the surrounding context. It is also important that each of the dwellings has its own identity. This is achieved by utilising a variety of treatments of the material palette to differentiate each dwelling. Dwelling one has horizontally laid cedar weatherboards, with Dwelling two having vertically laid cedar slats. The roof of dwelling one is grey zinc

cladding, whilst the roof of dwelling two is a dark red hue. This variation in treatment of the material palette clearly distinguishes the dwellings from the other, whilst still acknowledging the relationship they have to each other[Fig 169].

Being able to individualise the space with one's own belongings, is dependent on ample provision of space, both for storage and display. Large shelving units are placed throughout the dwellings to enable the occupant to display and store a variety of their own belongings. Once these shelving units are filled up they function as room dividers which can flexibly and subtly separate spaces. These shelving units intentionally provide a number of varying size shelves and voids to allow the occupant to display and store a variety of belongings [Figs 149, 154, 158, 165, 167 & 168].

Fig 165: Western Sectional Perspective of Dwelling 1 illustrating the varied activities which can occur within multiple spaces. This perspective also illustrates the various demographic groups which the dwelling can cater to.

Fig 166: Eastern Sectional Perspective of Dwelling 1 illustrating the varied activities which can occur within multiple spaces. This perspective also illustrates the various demographic groups which the dwelling can cater to.

Fig 167: Western Sectional Perspective of Dwelling 2 illustrating the varied activities which can occur within multiple spaces. This perspective also illustrates the various demographic groups which the dwelling can cater to.

Fig 168: Eastern Sectional Perspective of Dwelling 2 illustrating the varied activities which can occur within multiple spaces. This perspective also illustrates the various demographic groups which the dwelling can cater to.

Fig 169: Street perspective of both Dwellings illustrates the sympathetic approach to the surrounding neighbourhood's domestic scale. The material palette distinguishes the dwelling from the context, whilst the varied application of the material palette helps to visually distinguish between the two dwellings.

The sixth condition is health. The dwellings must support psychological and physiological benefits for the occupants. Maximising physiological health is achieved through using architectural elements which enable a warm and dry physical environment for the occupants. Elements which are incorporated in these design of these dwellings include fully insulating the floor, walls and roof and upgrading to double glazed window units to minimise heat loss. The use of pendant lighting as opposed to recessed lighting into the ceiling minimises holes in the thermal envelope. These dwellings have been subdivided with the consideration of solar orientation. The spatial arrangement allows each of the dwellings to receive morning sun into the living areas, and evening sun into the bedroom areas. This passively heats areas for the time of day when they are occupied most frequently. The retrofit of the two dwellings intentionally includes a retention and increase in north glazing as well as incorporating skylights. These elements enable natural light to penetrate deep into the dwellings. Good ventilation channels are vital to maintaining a dry home, and this is achieved by having openable windows on three facades and openable skylights on the roof to enable passive natural cross ventilation within each dwelling.

It is important that the dwellings support psychological health of the occupants. A relationship with nature is a vital requirement to maximise psychological health, and these dwellings provide access to private outdoor space, which is located at the rear of

the dwellings [Fig 170]. The large balconies receive afternoon and evening sun and give occupants space to undertake various living activities. A key psychological consideration that the dwellings must consider is that physical sickness becomes more common among the elderly, and the amount of time these people spend bedridden increases with age. Therefore the dwellings must take this into consideration and understand the negative psychological impact this can have on the occupant. In typical house design in New Zealand, bedrooms are often separated from the living spaces, located either at the end of corridors, or up/down a level. These dwellings take a different approach. In order to maintain psychological health, those undergoing physiological diminishments who are commonly bedridden, should remain part of daily activity. Architecturally, this is achieved through the arrangement of spaces and the relationships they have to each other. The bedrooms are intentionally not segregated from the rest of the dwellings, and in fact become an integral part of the Dwellings. From the bed in dwelling one, if the sliding door to the bedroom is open, the bedridden occupant can view into the kitchen and remain connected visually and audibly to the goings on within the home. The bedrooms also function as a thoroughfare as opposed to room at the end of a hall. In both dwellings, to get from the main living spaces to the outdoor spaces at the rear, occupants travel through the bedroom [Figs 165-168]. The bedroom becomes an important and vital part of the dwellings, and those confined to this space because of physical reasons, can still remain part of the household.

Fig 170: Rear perspective of outdoor space of both Dwellings illustrates access to ample outdoor space for a variety of living activities.

The seventh and final condition is ownership. This is important as ownership plays a significant role in the enabling an environment which one can associate with as “home.” Financial affordability has a significant impact on the ability of people to achieve ownership. Therefore this retrofit is intended to be financially viable. This has had a significant impact on design decisions. Certain architectural elements have been included to maximise financial affordability, both upfront and on-going. The first method of achieving this is designing the dwellings to have relatively small footprints, as the costs of a home often correlates to the to the floor area. Therefore both of the internal floor areas are kept below 60m². The second element is to ensure modest engineering requirements. Maintaining existing structure, structural lines, and right angled corners, ensures that the cost of the retrofit remains viable within New Zealand’s mainstream housing market. Ensuring low on-going costs is an essential component of affordability, thus ownership. This is achieved by incorporating energy efficient design principles at the time of the retrofit. The principles incorporated include the small footprint, the ability to compartmentalise the dwellings into various spaces which can be heated independently, as well as orientating the dwelling to maximise solar gains. It is also vital that maintenance costs for the dwellings are kept to a minimum. This is achieved by utilising materials including un-painted cedar cladding and powder coated metal roofing which are high quality and do not require intensive or expensive upkeep to maintain functional and aesthetic quality.

CONCLUSION OF DESIGN EXPLORATION 1-STATE HOUSE RETROFIT

To conclude, this design exploration presents an alternative viable architectural model to provide a multitude of living options for a range of demographic groups. This retrofit of an existing typical 1930’s state house illustrates architectural methods which can be utilised to create dwellings which enable ageing occupants to age in place for the remainder of their lives. Many of the design decisions applied to this exploration, could be replicated and applied to many state houses throughout New Zealand which share typical characteristics.

The exploration also uncovers limitations of this approach which includes inheriting deficiencies associated with suburban living, which includes the lack of public transport and access to amenities. This maintains the pre-existing dependence of cars for transport. Another limitation is the semi-attached nature of the resulting retrofit. This may be difficult for mainstream New Zealanders to accept initially, as suburban dwellings more often than not are expected to adhere to the requirements of the New Zealand dream, of a stand alone dwelling on a quarter acre site.

This alternative architectural solution presents a viable method to retrofit a typology which accounts for 29% of the current housing stock, and intensifies existing suburban situations. This has the potential to significantly increase the number of dwellings which provide environments conducive of ageing in place with dignity, which would significantly increase the quality of life for a growing number of ageing New Zealanders.

DESIGN EXPLORATION 2- 1990'S SUBURBAN VOLUME HOUSE RETROFIT

The second exploration is the proactive retrofit of an archetypal McMansion style house. The house selected for retrofit, is 31 Lanyon Place, Whitby, Wellington as it demonstrates many of the common characteristics of this typology. Typical characteristics include; a large floor area (300m²) over two levels; a 20° pitched, pressed metal tile clad multi gabled and hipped roof. The house itself is centred on the site and orientated toward the street with a protruding “snout” double garage [Figs 171 & 172]. The façade has limited ornamentation and is clad with monolithic plaster with large single glazed aluminium windows [Figs 173 & 174]. The services are scattered in a variety of locations throughout the home, with the majority of bedrooms located on level one with living areas located on the ground floor.

Fig 171: Aerial perspective illustrating the context and location of the existing house at 31 Lanyon Place, Whitby, Wellington.

Fig 172: Elevations of the existing house at 31 Lanyon Place, Whitby, Wellington illustrate external characteristics which are typical of Volume houses of the 1990's.

Fig 173: Aerial perspective illustrating the context and location of the existing house at 31 Lanyon Place, Whitby, Wellington.

Fig 174: Existing dwelling at 31 Lanyon Place. Whitby, Wellington illustrates external characteristics which are typical of Volume houses of the 1990's.

SOUTH ELEVATION

WEST ELEVATION

EXISTING GROUND FLOOR: 196m²

Fig 175: Existing ground floor plan of 31 Lanyon Place, Whitby, Wellington illustrates the spatial arrangement.

Fig 176: Existing First floor plan of 31 Lanyon Place, Whitby, Wellington illustrates the spatial arrangement.

Fig 177: North-East axonometric perspective of the existing dwelling illustrates external characteristics which are typical of Volume houses of the 1990's.

Fig 178: South-West axonometric perspective of the existing dwelling illustrates external characteristics which are typical of Volume houses of the 1990's.

Fig 179: Axonometric cut away of the existing dwelling illustrates the spatial arrangement and the external characteristics which are typical of Volume houses of the 1990's.

The aim of this design exploration is to illustrate how this typical 1990's suburban house could be re-appropriated to enable ageing New Zealanders to remain living in their homes within the same communities as they age. This design exploration proposes the design of three independent dwellings, within the envelope of the existing house, which would enable all occupants to age in place for life, and with dignity. The scenario for this exploration comprises of an ageing baby boomer couple who own the house, whose children have left home, and are considering downsizing. Typically this downsizing results in the move to a smaller home in a different location. This alternate architectural solution proposes that the house is subdivided into three smaller dwellings, which would enable the ageing occupants to age in place, remaining in a familiar home environment in a familiar location, while upgrading and spatially downsizing their home. This arrangement opens up a multitude of opportunities for the owners, giving them the option to sell or rent the other two dwellings for income, as well as providing accommodation for family or a live in carer.

DESIGN DECISIONS

The aim of the design is to demonstrate the viability of retrofitting this architectural typology. The retrofit process is explained through significant design decisions.

DESIGN DECISION 1

The first design decision was to determine the way in which the homes and site are to be subdivided. This decision was dependent on the desired spatial relationship and interaction between the three individual dwellings. This design exploration aims to illustrate the viability of retrofitting existing McMansion typologies which can provide a living model which will enable a variety of demographic groups to age in place. In order to maximise social heterogeneity and test the limitations of the architectural framework, these three occupant groups vary greatly in their life stage, priorities and requirements. This provides a wider range of flexible and more diverse dwelling types, than what currently exists within the suburban environment of New Zealand. The first dwelling is intended for a couple in the 20's or 30's with a young child. This dwelling is envisaged as an affordable dwelling which enables them to get on the first step of the housing ladder. Dwelling Two is intended for an ageing couple, in this case, the owners of the existing house, who see the need to downsize, but see no need to move to an alternative community or institution. Dwelling three, the upstairs dwelling, is intended as a investment rental property

SUBDIVISION OPTION A

SUBDIVISION OPTION B

SUBDIVISION OPTION C

SUBDIVISION OPTION D

by either the existing owners or others and is intended for two flatmates.

Figure 180 illustrates the 4 distinct ways the existing dwelling and site could be subdivided to create these three separate dwellings. The arrangement option selected for further exploration is Option Four. This re-arrangement option is favoured as it provides the best opportunities to clearly define each dwelling; and enabling hierarchically similar entrances, and street access for all three dwellings.

DESIGN DECISION TWO

The next design decision was to determine how much of the existing built environment is to be maintained. In order to encourage affordability and to maximise the viability of this living option, as much of the existing built environment as possible is maintained. The spatial arrangement and location of significant amenities and architectural features within the existing house have a significant influence on the proposed spatial arrangement and relationship of the three new dwellings [Fig 181 & 182]. The location of the outlets within the bathrooms and kitchen of the existing house are retained to minimise the cost of new services. The kitchen outlet, gas hob and extract of the original home [A] are retained in the same position in Dwelling One. The existing outlet locations in the existing downstairs bathroom are utilised in the cleansing space of Dwelling Two [B]. The locations of the existing upstairs bathrooms, and the outlets within these spaces[C] are retained for the cleansing spaces of Dwelling Three. The majority of window openings and windows are maintained[D]. The majority of the external walls are retained and re-clad, so too are a selection of interior walls[D]. The existing stair is retained in its current form and utilised as the access to Dwelling Three [E]. The location of these retained elements function as design drivers, influencing and informing the internal spatial arrangement of the three new dwellings.

Fig 181: Retained elements on the ground floor to be retained for use within the three new proposed dwellings.

Fig 182: Retained elements on the first floor to be retained for use within the three new proposed dwellings.

DESIGN DECISION THREE

The next significant design decision is the arrangement of the spaces within the three new dwellings. While this design exploration seeks to provide dwellings which cater to the requirements of three distinct demographics, it is essential that each of the dwellings enables all occupants to age in place, irrespective of their current life stage, in order to create a more responsive and dynamic housing stock. Therefore these dwellings must accommodate the requirements of the occupants in their current life stages, whilst also providing a home environment which enables them to remain in place as they undergo the diminishments of progressing age. Each of the dwellings must provide ample and well-designed spaces which enable certain living activities including eating, sleeping, dressing, bathing, resting, cooking, relaxing, entertaining, and working. As a key intention of this retrofit is to maximise affordability, small footprints are essential. This has resulted in small dwelling areas; Dwelling One at 99 m², Dwelling Two at 85m² and Dwelling three 101 m²; all of which require efficient spatial layout [Figs 183 & 184]. The resulting dwelling arrangements utilise an open plan living arrangement in order to maximise usable space and enable multiple living activities to be undertaken within the same areas.

The following plans illustrate how each of these dwellings function. Dwelling One [Figs 183, 185 & 186], located on the ground floor, which is intended for a young couple in the 20's or 30's with a young child, has two bedrooms; a master and a

single, one shared bathroom, large open combined living and working areas, and a large outdoor area. Dwelling Two, [Figs 183, 187 & 188] on the ground floor is intended for an ageing couple and has one bedroom, one bathroom, modest living areas and a relatively large outdoor space. This dwelling is envisaged to cater to occupants who are undergoing relatively significant physiological diminishments associated with the ageing process. Dwelling Three [Figs 184, 189 & 190], intended for two flatmates, is located on the first level. This dwelling has two bedrooms, two bathrooms, modest open living areas and an external space in the form of a balcony which wraps around the dwelling, replacing the pre-existing ground floor roof.

Each dwelling [Figs 185, 187 & 189] is broken down into three main parts, a primary (red), secondary(blue) and tertiary (yellow). Each of these parts caters to different living activities whilst providing different levels of privacy. The first is the Primary space. In each dwelling this area is the largest, at 69m² in Dwelling One, 56m² in Dwelling Two, and 56m² in Dwelling Three. This space is the most public of the areas, and provides space for food preparation, cooking, eating, entertaining, relaxing, and working. This zone is accessed directly from the front door and from this space one can move into the secondary and tertiary areas. The secondary space provides space for sleeping, dressing and relaxing, and is accessed directly from the primary space. The tertiary space is the smallest of the areas, and provides room for cleansing. This room houses a toilet, a vanity, a flat entry shower and laundry facilities.

DESIGN DECISION FOUR

The fourth design decision is to incorporate the architectural mechanisms and spatial techniques which enable the seven conditions of dignity. These innovations are the architectural features which directly impact the degree to which people are able to age with dignity within their home environment as they age. Architectural features which have been incorporated within the design of the three dwellings. Within the retrofitted typical suburban 1990's house, all three of the dwellings incorporate the seven conditions of human dignity to ensure that each dwelling enables all residents to age in place with dignity.

The first condition is capacity. All three dwellings incorporate certain architectural mechanisms which limit any physical barriers to access and circulation. These include providing required living areas across a single level within each dwelling, with all doors and thresholds being flush. This enables occupants with physiological diminishments to use the space in the same manner as those without the same limitations. In order to achieve this in dwelling two, which is intended to cater to older occupants who have an increased chance of mobility limitations, the existing raised garage floor is recessed to provide a level living area. Dwelling One retains its two step down into the living area down into in the as this dwelling is intended for younger occupants with a lesser chance of mobility limitations. The non-slip flooring materials are utilised as they enable those with limited mobility to move freely in, out and throughout the home without

limitation. Another architectural feature used in the dwellings is the exclusion of narrow corridors, in favour of either open spaces or wide circulation rooms. All three dwellings provide open spaces, with all corridors being at least 1500mm wide enabling inclusion of wall based shelving and desks so that these spaces become rooms within their own right.

Fig 183: Area and spatial arrangement of Dwelling 1, and Dwelling 2 on the ground floor.

Fig 184: Area and spatial arrangement of Dwelling 3 on level 1.

Fig 185: Diagram of spatial relationships between the Primary, Secondary & Tertiary zones within Dwelling 1

Fig 186: Axonometric cutaway of Dwelling 1

Fig 187: Diagram of spatial relationships between the Primary, Secondary & Tertiary zones within Dwelling 2

Fig 188: Axonometric cutaway of Dwelling 2

Fig 189: Diagram of spatial relationships between the Primary, Secondary & Tertiary zones within Dwelling 3

Fig 190: Axonometric cutaway of Dwelling 3

Architectural features within these three retrofitted dwellings utilise universal design and incorporate barrier free principals. The first architectural example of this is found in the cooking spaces of each of these dwellings. The sink and the bench are devoid of any fixed cabinetry underneath them. This means that any occupant limited to a wheelchair can use these elements as their legs can fit underneath the bench if required [Figs 191 & 194]. The kitchen spaces of all three dwellings, illustrate how three kitchens with a similar arrangement of components can function well for a variety of people, all with varied requirements [Figs 191-194].

Any new internal door incorporated has wide (900mm) openings, are lightweight and slide open and closed. These sliding doors function as a portion of the wall enabling the occupant to open and close spaces as desired, whilst also making the door opening action as simple as possible for those occupants with diminishing physical capacity and strength.

A variety of architectural mechanisms are implemented within the interior of these dwellings to maximise legibility for the occupant. A varied material palette is utilised to clearly indicate spatial changes and to distinguish between the floors, walls and roof. The floor of the primary spaces are non-slip wooden floor boards, and the secondary space is carpeted to give a sense of comfort and warmth. The areas which receive moisture, in the cooking area and the cleaning area, use large format non slip stone flooring tiles. Each element has a clear identity, in an attempt to maximise the occupant's legibility of the space. All

furniture and fittings are clearly differentiated from the built environment with contrasting colours and textures. Red is used as accent colours for bench tops and drawers in the kitchens [Figs 191-194] and the room dividing door is coloured to clearly distinguish these elements to improve visual perception and aid

Fig 191: Interior perspective of Dwelling 1's Kitchen, illustrating that the arrangement of the kitchen elements enables this space to cater to a wide variety of demographics and capacity.

people in distinguishing between elements. Internal door leafs and frames, and light switches intentionally contrast with the wall colours. The intent of this is to maximise visibility and spatial understanding for the occupant.

Fig 192: Interior perspective of Dwelling 1's Kitchen, illustrating that the arrangement of the kitchen elements enables this space to cater to a wide variety of demographics and capacity.

Fig 193: Interior perspective of Dwelling 3's Kitchen, illustrating that the arrangement of the kitchen elements enables this space to cater to a wide variety of demographics and capacity.

Fig 194: Interior perspective of Dwelling 2's Kitchen, illustrating that the arrangement of the kitchen elements enables this space to cater to a wide variety of demographics and capacity.

The second condition which the dwellings must provide is Self-worth. The design of these dwellings incorporates architectural mechanisms which allow the dwellings to retain the highest quality physical condition, with as little on-going maintenance as possible. All three dwellings have been re-roofed and re clad with long lasting, low maintenance materials [Fig 195]. Vertical and horizontal cedar boards and red and grey standing seam powder coated zinc is utilised for cladding and roofing materials. These materials will retain both high quality performance and aesthetic quality, without requiring constant cleaning and re-surfacing. This results in a high quality environment without a highly intensive maintenance and repair workload, which is commonly expensive and tiresome for occupants.

A secondary method of maximising self-worth is to celebrate each living activity to maximise quality of life. All three dwellings create architectural moments which celebrate living activities which occur within. These moments are influenced by spatial form, natural lighting, and views out. The use of skylights in certain locations maximise natural daylight into the spaces and lighten the spaces as much as possible.

The value of a cleansing space within a home environment is essential for dignity to be retained for frail occupants. In response to this, the cleansing space of each dwelling places emphasis on creating a spatial experience which encourages relaxation. The cleansing spaces of each of the individual dwellings share common elements which include placing the

Fig 195: External Elevations of the proposed dwellings. The varied treatment of a similar material palette function to aesthetically distinguish between the three dwellings.

showering space within an enclave, with an integrated seat element, which can double as a shelf. In Dwelling Two and Three a high sloping ceiling allows an openable skylight to be placed over the shower enabling light in, and views and moisture out. This allows natural light to stream down onto the occupant when showering and allowing skyward views out. This transposes the typical spatial experience of a bathroom. The intent is that this space becomes much more than a place to clean, but becomes a space which celebrates the ability and the act of cleansing oneself which is vital for an individual's self-worth. As illustrated the arrangement of these cleansing spaces have taken into account the requirements of a wide variety of people at various stages in their age and health [Figs 198-200].

Fig 196: Bathroom 1 within Dwelling 3

Fig 197: Bathroom 2 within Dwelling 3

Fig 198: The arrangement of elements within the bathroom of Dwelling 2 enables this space to cater to the requirements of a wide variety of demographic groups, and varied capacity levels.

Fig 199: The arrangement of elements within the bathroom of Dwelling 2 enables this space to cater to the requirements of a wide variety of demographic groups, and varied capacity levels.

Fig 200: The arrangement of elements within the bathroom of Dwelling 2 enables this space to cater to the requirements of a wide variety of demographic groups, and varied capacity levels.

The third condition is Solitude. Privacy and security of the occupant is achieved through a variety of architectural mechanisms. The first is to provide the occupant with progressive levels of privacy which enables the occupant to limit any exposure or vulnerability they may experience. The three zones, Primary, Tertiary and Secondary within each dwelling [Figs 185, 187, 189] function as three different levels of privacy. The most public; the primary space opens up visually to the street face and is where the entertaining of guests and visitors can occur. The secondary space is more private as the living activities which occur here are more personal. These spaces can be closed off from the primary space using a sliding door at any time. The tertiary space is where the occupant is most vulnerable and is the most private of all. At any time the occupant can choose to open and close the doors between these three spaces to control the degree of privacy they experience.

Each of the dwellings provides private outdoor space. These clearly defined external spaces give the occupants another area to undertake certain living activities, whilst also functioning as a threshold between public street)and fully private dwelling [Figs 201- 203] .

The new dwellings inherit architectural attributes from the existing house which enable privacy to be maintained. The glazing to the street front is modest in scale [Fig 195; South Elevation]. The dwellings are set back considerably from the street allow the front garden and planting to function as a buffer between

the public street and the private dwellings to maximise occupant privacy.

The open plan spatial arrangements of each dwelling provides clear sightlines throughout the dwellings and beyond, which allows occupants to view what is happening throughout the home and outside, from a variety of vantage points within the home. The open spatial arrangement of dwelling one enables occupants to survey what is occurring within the living areas and communicate with other occupants from a variety of vantage points, namely the kitchen space, from where almost every space is visible [Fig 204]. Dwelling two illustrates how the bedroom functions as a vantage point as from where the entrance, bathroom, kitchen, living area and workspace are visible [Fig 205]. Dwelling three illustrates how the open plan of the living arrangement enables the kitchen to function as a central point in the dwelling where the surrounding rooms can be viewed [Fig 206].

These vantage points and sightlines within the dwellings are significant to solitude of the occupants as they enable the occupant to survey their dwelling and beyond. This results in living environments which provide the occupant with security, by enabling passive surveillance.

Fig 201: Perspective illustrates the outdoor space of Dwelling 1

Fig 202: Perspective illustrates the outdoor space of Dwelling 2

Fig 203: Perspective illustrates the outdoor space of Dwelling 3

Fig 204: Interior perspective of Dwelling 1 illustrating the open plan arrangement which enable surveillance and communication from the kitchen space to all other spaces.

Fig 205: Interior perspective of Dwelling 2 illustrating the open plan arrangement which enables surveillance and communication from the bedroom space to other spaces.

Fig 206: Interior perspective of Dwelling 3 illustrating the open plan arrangement which enables surveillance and communication from the kitchen space to other spaces.

The use of sliding doors throughout the home enables the occupants to easily close off spaces for privacy, and choose the level to which they want to close off the spaces [Figs 204, 205, 208, 213]. Another method of achieving solitude is by grouping the entrances to all three dwellings together. This encourages unintentional encounters with the occupants from the other dwellings [Fig 207]. These chance meetings increase social interaction and familiarity with neighbours which can provide a sense of security for the occupants which is a key determinant of solitude.

Fig 207: Grouped entrance to all three dwelling. This increases the chance of unintentional interactions between occupants having a positive effect on the solitude of the occupants.

The fourth condition is Social power. Architectural elements which illustrate any physical shortcomings of the occupant, which can subjugate elderly occupants as deviating from conventional function are omitted. This is achieved by eliminating the tacked on, single use architectural elements which have become common place aid devices for the elderly. Intentionally omitted from the dwellings designs are tacked on access ramps, hand rails, fold down shower seats, stair lifts and home elevators. The dwellings illustrate the importance of integrating design elements which are multi-functional to help elderly occupants with any deficiencies that may occur, whilst also usefully functioning for other demographic groups. The shelves of the bathroom vanity, located directly next to the toilet, function as storage space whilst doubling as a physical aid in getting off the toilet if at any time the occupant requires [Fig 198]. The integrated seat found within the large walk/roll-in showers, is an element which enables someone with restricted mobility to shower independently, whilst still being used by more able bodied occupants to enable a more relaxing cleansing experience [Figs 198 & 200] by enabling occupants to sit down, as well as being used for storing shower products. The shower which is large enough to accommodate a wheelchair also enables multiple people to shower simultaneously. This enables parents to shower with young children, and elderly partners or caregivers offer help if required [Figs 198, 199 & 200].

The fifth condition is Individuality. It is vital that these dwellings enable self-expression of the occupants and limit the chance of objectification and homogenisation of the occupant's living environment. Architectural methods to achieve this include enabling the occupant to dictate how they use the spaces. This has been attempted within these dwellings through the elimination of standardised single use room designations, and the design of polyvalent multipurpose spaces which allow the occupant to choose to sleep, eat, entertain, read and work in multiple areas [Figure 208]. This becomes difficult in a small dwelling, however the utilisation of an open plan living arrangement, the use of movable shelving units as soft room dividers, and sliding doors which can close and open up space allows the occupants of these dwellings maximum control over their space. Within each dwelling the occupant could for example read and work on the bed, on the couch, at the kitchen bench, at the work bench or on the dining room table [Fig 208]. Similarly occupants can entertain at the dining room table at the kitchen bench, in the living area as well as the outdoor areas. [Fig 209]. They can eat at the dining room table, in bed, the kitchen bench, or in the living area. Enabling a multitude of living activities to take place in a multitude of different spaces within the dwelling gives the choice of how to use the space to the occupant, which gives control to the occupant and in turn enables individuality.

Another way to encourage individuality is by distinguishing the dwelling both from the surrounding context, and enabling all three dwellings to be aesthetically differentiated from each other. This is achieved through the application of a material palette which departs from the traditional New Zealand suburban wall and roof cladding materials. The walls of all the dwellings are clad with a mix of a material palette consisting of unpainted vertically & horizontally orientated cedar slats, standing seam zinc coloured in both red and grey, for both cladding and roofing. The varied application of this material palette enables each of the three dwellings to be differentiated from each other and from the surrounding context, to enable occupants to identify with a dwelling as their own [Figs 195, 201, 202, 203, 210 & 211].

Fig 208: Dwelling one illustrates how reading can occur in a variety of spaces, giving choice to the occupant as to how exactly to use the space.

Fig 209: Dwelling one illustrates how entertaining guests can occur in a variety of spaces, giving control to the occupant as to how exactly to use the space.

Fig 210: Street perspective of the retrofitted 1990's McMansion illustrates how the three dwellings are distinguished from each other. The roof and wall cladding treatments enables each dwelling to have its own aesthetic identity.

Fig 211: Street perspective of the retrofitted 1990's McMansion illustrates how the three dwellings are distinguished from each other. The roof and wall cladding treatments enables each dwelling to have its own aesthetic identity.

The sixth condition is health. The dwellings must support psychological and physiological benefits of the occupants. Maximising physiological health can be achieved through using architectural elements which enable a warm and dry physical environment for the occupants. The elements which are utilised in the retrofit of these three dwellings to aid physiological health include fully insulating the floor, walls and roof and utilising double glazed window units to minimise heat loss. The utilisation of pendant lighting where possible, in place of recessed lighting into the ceiling, minimises holes in the thermal envelope. Within each dwelling, solar orientation has been considered in order to maximise sunlight and daylight to living space. The large amounts of north facing glazing is intentionally maintained and the implementation of skylights enables natural light to penetrate deep into the dwellings to create naturally warm, light environments. Good ventilation channels are vital to maintaining a dry home, and this is achieved by having open-able windows on all facades and openable skylights on the roof where possible to enable passive natural cross ventilation within each dwelling.

It is vital that the dwellings also support psychological health of the occupants. A relationship with nature is a vital requirement to maximise psychological health, and these dwellings provide access to private outdoor space. The large balconies, and garden space which receive afternoon and evening sun, give occupants space to undertake various living activities including entertaining, relaxing and gardening [Figs 201, 202 & 203].

A key psychological consideration that required consideration is the fact that physical sickness becomes more common among the elderly, and the amount of time occupants spend bedridden increases with age. The design of the dwellings must take this into consideration and understand the negative psychological impact this can have on the occupant. In typical house design in New Zealand, bedrooms are often separated from the living spaces, located either at the end of corridors, or up or down a level. However each of these dwellings incorporates an alternate approach. In order to maintain psychological health, those undergoing physiological diminishment and bedridden need to remain part of daily activity. Architecturally, this can be achieved through the arrangement of spaces and the relationships they have to each other. Within dwelling one and two (the dwellings which are expected to most commonly be occupied by elderly occupants), the bedrooms are intentionally not segregated from the rest of the dwellings, and in fact become an integral part of the Dwellings. As illustrated, the location and arrangement of the bedroom spaces, enables bedridden occupants to open sliding doors to remain connected visually and audibly to the goings on within the home. This allows occupants confined to this space to remain part of the household [Figs 205, 212, 213 & 214].

Fig 212: Sectional Perspective of Dwelling 1, illustrating the relationship between the bedroom and the living space, which enable bedridden occupants to remain connected visually and audibly to the goings on within the dwellings.

Fig 213: Interior perspective illustrating the relationship between the bedroom and the living space, which enable bedridden occupants to remain connected visually and audibly to the goings on within the dwellings.

Fig 214: Sectional Perspective of Dwelling 2, illustrating the relationship between the bedroom, work space, bathroom and living space, which enable bedridden occupants to remain connected visually and audibly to the goings on within the dwellings.

The seventh and final condition is ownership. This is important as ownership, both financial and spatial, plays a significant role in the enabling an environment which one can associate with as “home.” In order for this to occur the two significant aspects which need to be incorporated are financial affordability and individual spatial identity.

This retrofit exploration is intended to be a financially viable option, as housing affordability is a determinant of home ownership. As a result certain architectural elements have been included to maximise financial affordability, both upfront and on-going, in order to make this living model viable and accessible within New Zealand’s mainstream housing market. The cost of a home often correlates to the floor area, so designing dwellings with relatively small footprints is an effective method of achieving affordability. Subdividing the existing 285m² single dwelling into 3 independent dwellings, with floor areas of 99m², 85m² and 101m² respectively is a method of increasing affordability. By subdividing the site and dwelling into three, the price of the dwellings is divided into three. This has the potential to split the cost of the existing dwelling 3 ways. It is also important to take into consideration the cost of undertaking such a retrofit. To ensure financial affordability of the retrofit, as much of the existing dwelling has been maintained as possible. Outlets are maintained to minimise infrastructural cost, and wall framing, lintels and windows are maintained. Although the overall form has been altered, it was an important consideration to ensure

modest engineering requirements. This has been achieved by utilising simple gable forms for the roof and ensuring that simple structural lines are maintained. The price of the alterations can be included and recouped when the other dwellings are sold off. The \$690,000 (GV) price of the house, plus the estimated \$200,000 for the alterations means that each dwelling could sell for \$313,000. This is well below New Zealand’s current average dwelling price of \$441,254. As a price point, this enables a larger variety of demographic groups access to the option of purchasing a home in an area usually reserved only for middle class, high income families. This has the potential to increase the incidence of home ownership amongst demographic groups who are presently excluded from the option of purchasing a home, and thus missing out on the benefits of home ownership.

Low on-going running costs are essential for long term affordability for the occupants. In response to this, energy efficient design principals are incorporated where possible in the design of the retrofitted dwellings. These principles include a small footprint, the ability to compartmentalise the dwellings into various spaces which can be heated independently, orientating the dwelling to maximise solar gains. Utilising materials such as un-painted cedar cladding and powder coated zinc roofing which require little upkeep, enable low on-going maintenance costs for the dwellings.

The materials utilised are of high quality, so have a higher upfront cost than standard housing cladding materials. However it is deemed necessary to incorporate materials which will have longevity to enable the dwellings to become homes for life.

The second consideration of ownership is the occupant experiencing spatial ownership. One important aspect to spatial ownership is identifying with objects and space. It is important that each of the dwellings read as their own object, each with their own distinct aesthetic identity. This is especially challenging when the dwellings are connected. The method of differentiating the dwellings is via the application of varied roof and cladding treatments. As illustrated [Figs 195, 201, 202, 203, 210 & 211] the cladding materials vary to illustrate each separate dwelling. Dwelling one is clad in horizontal cedar weatherboards, with no discernible roof plan. Dwelling two is clad in vertical cedar slats at either end of red zinc standing seam clad gable wrapping over. Whilst dwelling three also has vertical cedar slats at either end of the gable, the grey zinc standing seam wraps over the gable and extends to the ground on the southern façade to indicate ownership of this space the dwelling three. This vertical component also functions to visually separate dwelling one and two. The application of certain materials for cladding functions as a signifier of spatial ownership and enables occupants to associate a form and space as theirs.

CONCLUSION OF DESIGN EXPLORATION 2- 1990'S SUBURBAN VOLUME HOUSES RETROFIT

To conclude, this design exploration presents an alternative viable living option as a method of increasing the number of dwellings in New Zealand which provides homes conducive of enabling dignity and encouraging ageing in place by an ageing population.

By providing three distinct dwellings which can cater to a wide range of demographics, life stages, and capacity, these dwellings encourage social heterogeneity of the occupants. The existing owners have the opportunity to remain in one of the dwellings, depending on their living requirements and sell the other two dwellings. This functions to release equity in the home, which can free up funding for life in retirement. The owners could also choose to retain ownership of the dwellings and rent the dwellings out to ensure an on-going income in retirement.

The exploration also uncovers limitations of this approach which includes inheriting attributed associated with suburban living. These include the lack of public transport and access to amenities. Another limitation is the 3 dwellings within one envelope. Although apartments and shared walls are common within inner city dwellings, suburban dwellings are very seldom conjoined. This concept of 3 in 1, is expected to be difficult for mainstream New Zealanders to accept initially, as these dwellings do not adhere to the expectations of a stand alone dwelling on a quarter acre site. Under current legislation the

subdivision process of splitting 1 title into three is expected to be a relatively long and costly process. If this proposed living model is to be implemented successfully, a re-think of legislation and intensification restrictions is required by the appropriate Governing bodies.

The 7 conditions of dignity have had significant influence on the design of each dwelling and all dwellings have incorporated architectural features which enable the occupant to age in place, even as they undergo diminishments in old age.

This design exploration has retrofitted a house which is typical to Volume houses built between 1990-2006. The shared characteristics of these homes, mean that design decisions implemented in this design exploration could be applied in a similar manner to achieve similar results in many other dwellings of this same typology. As this typology accounts for 19% of the current housing stock this has the potential to significantly increase the number of dwellings which provide environments conducive of ageing in place with dignity, which would significantly increase the quality of life for a growing number of ageing New Zealanders.

DESIGN EXPLORATION 3- PROACTIVE NEW BUILD

The third exploration is a proactive new build on a fresh site. The aim of this design exploration is to illustrate how a new living model could be built in New Zealand's suburbs which would enable the growing ageing population to live in homes for the rest of their life, with dignity. At present the only dwellings specifically designed for the elderly are found in aged segregated retirement communities, and the limitations of these communities are made clear in Chapter 4. This exploration proposes an alternative new build architectural model which provides housing for life, designed to cater to the requirements of the elderly, whilst also providing appropriate dwellings for other demographic groups, with the intention that all the occupants are truly able to age in place.

DESIGN DECISIONS

The process used in the design of these dwellings is illustrated through a series of significant design decisions.

DESIGN DECISION 1

The first design decision was the selection of the site for development. As it is important that a viable housing model is produced, a realistic and affordable section of land is required. Inner city sites were excluded due to the high price of land within urban centers, and this exploration for a new housing model is set in a typical suburb. The patterns and characteristics

of existing suburban developments in New Zealand have been constant since World War Two, and show no sign of subsiding. The trend of developers purchasing large scale areas of land, subdividing them into parcels often between 700m² to 1000m², constructing slight variations of specification homes with large footprints on each site, to sell on to the general public is expected to continue. This type of suburban development has been fuelled by New Zealanders strong desire to own there own home, on their own piece of land. Sprawling suburbs have been the only place for this type of development to occur, and the popularity and continued growth of these suburbs is testament to the popularity of this type of living. These types of suburban developments often grow relatively quickly as demand necessitates [Fig 216]. Whitby is one of Wellington's northern suburbs, which illustrates the characteristic street layouts and housing types typical of a New Zealand suburb [Fig 215].

Fig 215: Aerial perspective of Whitby illustrates the typical site size, house type and arrangement of a typical New Zealand suburban landscape.

The decision was made to attempt to deal with these suburban developments head on and propose a new living model within this suburban context.

In order to undertake a realistic search for the site of this design exploration, it was necessary to take the conventional avenues that someone looking for a new site would undertake. The Whitby Sections website provides maps of sections for sale, illustrating the location, shape and area of the sites [Fig 217]. The sites selected were two adjacent lots; 16 and 17 Navigation Drive found for sale on Whitby Sections website. Lot 17 has an area of 660m² with a land value of \$145,000, and Lot 16 has an area of 615m² with a land value of \$155,000. Combined these sites are 1275m² with a price of \$300,000. This exploration proposes that the two sites are purchased together, combined into one large site, then re- subdivided into 4 smaller lots, on which 4 separate dwellings will be built. Four is seen as the optimum number of dwellings on the site, as it enables an ample floor area for dwellings (80m²-120m²), which efficiently use space, each within a relatively small site. This is seen as a method of improving affordability of new builds on new sections whist also intensifying an ever sprawling suburban situation.

Fig 216: Aerial Perspectives of Navigation Drive, Whitby, from 2002-2013 illustrates the growth of these suburban landscapes

Fig 217: Section arrangements and size from where the two sites were selected, Number 16 and 17.

DESIGN DECISION 2

As social heterogeneity is advocated throughout this thesis, it is vital that the dwellings created are not designed for the elderly alone, and that they are able to cater to the requirements of a wide variety of demographic groups and life situations. Considering the unique requirements of the elderly and incorporating shared architectural and programmatic elements into all dwellings, is important as it enables all types of occupants to live in these dwellings for their entire lives, and enable true ageing in place. The success of this type of living model is dependant on the dwelling's ability to be flexible and cater to as many demographic groups and life situations as possible. As a result of this it was decided that each dwelling was to be designed with one specific demographic in mind, whilst including design elements which enable each of the dwellings to cater to different demographic groups. The four demographics which these dwellings will cater to are selected as they represent 4 distinctly different life stages, each requiring different amenities and each with different priorities. Dwelling One is designed to cater primarily to a recently retired baby boomer couple. Dwelling two is designed with two single occupants in mind. Dwelling three is designed with a single elderly occupant in mind and Dwelling four is designed for a Young family with a child. All four dwellings differ in their floor plan, floor area, orientation and spatial arrangement, each responding to their own site conditions, and specific occupant requirements.

The intention is to illustrate that if each of the dwellings adheres to the certain shared architectural and programmatic guidelines developed, that issues of site constraints, varied occupant requirements and priorities, can be overcome to provide a range of dwellings which enable all types of occupants to age in place, and to age with dignity.

DESIGN DECISION 3

The approach to re-subdividing the site into 4 sites, and the way that the 4 individual dwellings would sit within these sites and relate to each other was the next design decision. The two sites are flanked by a main road and two side roads, enabling access to the site from three sides. As illustrated, this site lends itself to a multitude of dwelling and section arrangements [Fig 218]. All options intentionally illustrate detached dwellings as it is considered vital that each dwelling is clearly differentiated from other dwellings to maximise spatial ownership and individuality, which had not been explored in previous joined design explorations.

Arrangement 1, illustrates a uniform arrangement of dwellings orientated North-South. Each site and dwelling has equal size and hierarchy. This arrangement enables each dwelling to be accessed from the main street front, however this arrangement limits the dwellings to homogeneous, long rectangular forms on narrow sites.

DWELLING ARRANGEMENT OPTION 1

DWELLING ARRANGEMENT OPTION 2

DWELLING ARRANGEMENT OPTION 3

DWELLING ARRANGEMENT OPTION 4

DWELLING ARRANGEMENT OPTION 5

DWELLING ARRANGEMENT OPTION 6

Fig 218: Range and progression of site subdivision, and dwelling location and size for 116-118 Navigation Drive, Whitby.

Arrangement 2, illustrates a staggered uniform arrangement to illustrate how placing each rectangular dwelling off center enables a variation of outdoor space for each dwelling. This arrangement enables access from the street front but similarly to Arrangement 1, limits the dwellings to long rectangular forms.

Arrangement 3 illustrates how the 90° rotation of the dwellings changes the relationship of the dwellings to each other. Although the dwellings remain rectangular, the East-West orientation enables a higher proportion of frontage toward the north for solar orientation. Two of the dwellings are accessed from the main street with two being accessed from the side streets.

Arrangement 4 illustrates a hybrid of option 2 and 3, with 2 dwellings orientated North-South and two orientated East-West, providing a variation in dwelling forms and orientations. All four dwellings can be accessed from the main street front, however each of the dwellings remain rectangular in form, encouraging homogeneity.

Arrangement 5 illustrates a variation of dwelling forms which have been shaped to fit on each of the sites. Three of the 4 dwellings are accessed from the main street front with dwelling 3 being access from a side street. This arrangement would enable each dwelling to have it's own identity, enabling aesthetic and programmatic heterogeneity, and the site arrangements gives each dwelling sizable private outdoor space.

Arrangement 6 is a slight variation of arrangement 5, with the inclusion of a shared central outdoor area, which can be accessed from the private outdoor areas of each individual dwelling. The individual sites are about half the typical section size, ranging from 240m² to 322m². The site has typological undulation, sloping down toward the South-West, and the design of the dwellings takes this into consideration. This arrangements enables each dwelling to sit at a variety of levels with flush entrances into each. This arrangement provides ample outdoor areas to each dwelling, and enables each dwelling to maximise solar orientation. This arrangement also enables a very clear demarcation of sites for ownership purposes. Arrangement 6 is the option selected for further exploration.

DESIGN DECISION 4

The next significant design decision is the arrangement of the spaces within the four new dwellings. It is essential that each of the dwellings enables the occupants to age in place in order to create a more responsive and dynamic housing stock. Therefore these dwellings must accommodate the requirements of the occupants in both their current life stages, whilst also providing a home environment which enables them to remain in place as they undergo the diminishments of progressing age. Each of the dwellings must provide ample spaces which enable certain living activities which include eating, sleeping, dressing, bathing, resting, cooking, relaxing, entertaining, and working. As a key intention of this design is to maximise affordability, small area

footprints are essential. This has resulted in small dwelling areas Dwelling One- 75 m², Dwelling Two- 111 m², Dwelling Three 76m², Dwelling Four- 120 m². All of which require efficient spatial layout. The resulting dwelling arrangements all utilise an open plan living arrangement in order to maximise usable space and enable multiple living activities to be undertaken within the same areas. The decision was made to utilise an open plan living arrangement throughout all of the dwellings. This maximises usable space and allows multiple activities to be undertaken in the same areas, whilst enabling the occupant to use the space as they see fit. As each of the dwellings has a modest floor area, ranging from 75m² and 120m², it is important to maximise the perceived size of the space. The architectural method used to achieve this is the exclusion of the traditional ceiling and exposing the underside form of the pitched roof. By having changing roof heights from 2200mm to 4700mm the vertical distance to the roof varies, altering the perception of the spaces. As the spaces are no longer vertically rectilinear, the spatial experiences change as one moves from one space to another, and what is a relatively small footprint, is extended spatially.

The following plans illustrate how each of these dwellings function. Dwelling One, intended for an retired couple has one bedroom, one bathroom, a large open shared living and working area, and an outdoor area [Figs 221 &222]. Dwelling Two, is intended for two single flatmates. This dwelling has two bedrooms, one bathroom, open living areas and a workspace

incorporated into the circulation space into the bedrooms [Figs 223 &224]. Dwelling Three is intended for a single elderly occupant. This dwelling has one bedroom, a bathroom and modest open living areas [Figs 225 &226]. Dwelling four is intended for a small family. This dwelling has two bedrooms, a bathroom, and a shared open living area and workspace [Figs 227 &228].

Each dwelling is broken down into three main parts, a primary (red), secondary (blue) and tertiary (yellow). Each of these parts caters to different living activities whilst providing different levels of privacy. The first is the Primary space. In each dwelling this area is the largest. This space is the most public of the areas, and provides space for food preparation, cooking, eating, entertaining, relaxing, and working. This zone is accessed directly from the front door and from this space one can move into the secondary and tertiary areas. The secondary space provides space for sleeping, dressing and relaxing, and is accessed directly from the primary space. The tertiary space (Yellow) is the smallest of the areas, and provides room for cleansing. This room houses a toilet, a vanity, a flat entry shower and laundry facilities. [Figs 221, 223, 225, 227]

Fig 219: The Ground floor plans of all four dwellings illustrates the spatial arrangement, floor area, and relationship to outdoor private space, shared outdoor space with other dwellings.

Fig 220: The roof plan of all four dwellings illustrates the roof planes of each dwelling, the location of skylights and the relationship between each of the dwellings.

Fig 221: Diagram of spatial relationships between the Primary, Secondary & Tertiary zones within Dwelling 1

Fig 222: Axonometric cutaway of Dwelling 1

Fig 223: Diagram of spatial relationships between the Primary, Secondary & Tertiary zones within Dwelling 2

Fig 224: Axonometric cutaway of Dwelling 1

Fig 225: Diagram of spatial relationships between the Primary, Secondary & Tertiary zones within Dwelling 3

Fig 226: Axonometric cutaway of Dwelling 1

Fig 227: Diagram of spatial relationships between the Primary, Secondary & Tertiary zones within Dwelling 4

Fig 228: Axonometric cutaway of Dwelling 4

DESIGN DECISION 5

The fifth design decision is to incorporate the architectural mechanisms and spatial techniques which enable the seven conditions of dignity. These innovations are the architectural features which directly impact the degree to which people are able to age with dignity within their home environment. The intent is that each dwelling is able to cater for a variety of demographic situations, and also enable all occupants to continue living within these dwellings with dignity as their age progresses. As a result, each dwelling has incorporated pertinent architectural elements and features which enable the 7 conditions for human dignity in old age.

The first condition is capacity. To ensure this is enabled and retained by the occupants, physical barriers to access and circulation are eliminated. All required living areas are provided on one level, with all doors and thresholds being flush. The flooring materials utilised are all non-slip and have been intentionally selected as they promote access, the floor boards, large format concrete tiles, and low pile carpeting enables those with limited mobility (not able to step over a lip, requiring assistance of a roller Zimmer frame, or wheelchair bound) to move freely in, out and throughout the home without limitation. The third architectural feature for capacity is the exclusion any narrow corridors, in favour of either open spaces or wide circulation rooms. All four dwellings provide open spaces, with all corridors at least 1500mm wide. This allows these spaces to

incorporate wall based shelving and desks so that these spaces become rooms within their own right [Figs 229,230 &231]

Fig 229: Interior perspective of the wide corridor in Dwelling 2

Fig 230: Interior perspective of the wide corridor in Dwelling 3

Fig 231: Interior perspective of the wide corridor in Dwelling 4

It is important that these new dwellings are forgiving of error and relieve every occupant, both young & old, able bodied or not, of any deficits they may experience. Architectural features within these new dwellings utilise universal design and incorporate barrier free principals. The first architectural example of this is found in the cooking spaces of each of these dwellings. The sink and the bench are devoid of any fixed cabinetry underneath

which enables any occupant limited to a wheelchair to use these elements as their legs can fit underneath the bench. The arrangements of the kitchen bench functions as a mechanism which separates this kitchen space from the other living areas. The kitchen spaces of all four dwellings, and illustrate how 4 kitchens with a similar arrangement of components can function well for a wide variety of people [Figs 232,233, 234 & 235].

Fig 232: Interior perspective of the Kitchen of Dwelling 1 illustrating how the elements used and spatial arrangement of the kitchen can function for an elderly couple with physical diminishments.

Fig 233: Interior perspective of the Kitchen of Dwelling 2 illustrating how the elements used and spatial arrangement of the kitchen can function for a younger flatmates. When space under bench is not required for wheelchair users, additional storage units can be added or removed as required.

Fig 234: : Interior perspective of the Kitchen of Dwelling 3 illustrating how the elements used and spatial arrangement of the kitchen can function for a single elderly occupant with physical diminishments.

Full height mirrors and windows are utilised wherever possible to enable an inhabitant limited to a sitting position, or a small child, have the same opportunity to use these elements as any other occupant. Levered and long vertical door handles are used as these elements simplify the door opening action for those with limited or diminishing dexterity, whilst also functioning for able

Fig 235: Interior perspective of the Kitchen of Dwelling 4 illustrating how the elements used and spatial arrangement of the kitchen can function for a young family.

bodied inhabitants. The tap levers used in the bathroom and kitchen are levered mixer taps for the same reason. All internal doors have wide openings, are lightweight and slide open and closed. These sliding doors function as a portion of the wall enabling the occupant to open and close spaces as desired, whilst

also making the door opening action as simple as possible for those occupants with diminishing physical capacity and strength. Internal doors and light switches intentionally contrast with the wall colours in order to maximise visibility and spatial understanding for the occupant [Fig 236].

Fig 236: Interior perspective illustrating a contrasting light switch as well as how a typical door functions and contrasts with the wall within which it sits. These elements can aid visual legibility for all occupants.

A variety of architectural mechanisms are implemented within the interior of these dwellings to maximise legibility for the occupant. A varied material palette is utilised to clearly indicate spatial changes and to distinguish between the floors, walls and roof. The floor of the primary space is non-slip wooden floor boards [Fig 239], with the secondary space being carpeted to give a sense of comfort and warmth [Fig 237]. The areas which receive moisture, in the cooking area and the cleaning area, use large format non slip stone flooring tiles [Figs 238 & 239]. The exterior walls are expressed shuttered concrete, and these structural walls also enable a multitude of visual treatments. These walls can be

Fig 237: Interior perspective of the secondary space of Dwelling 4 illustrating the contrasting floor, wall and roof material utilised.

left exposed, whitewashed or painted any colour while still clearly distinguishing between the floor and the roof. Internal partition walls are painted plasterboard which distinguishes these walls from the external walls, whilst also functioning as canvases for paintings, art, or pictures. The ceiling is clad with horizontally laid wooden boards above the roof structure [Figs 236, 237, 238, 239]. Each element within the dwellings have a clear identity, in

Fig 238: Interior perspective of the tertiary space of Dwelling 4 illustrating the contrasting floor, wall and roof material utilised.

attempts to maximise the occupant's legibility of the space. All furniture and fittings are clearly differentiated from the built environment with contrasting colours and textures. Red is used as accent colours for bench tops in the kitchen [Figs 232, 233, 234 & 235] and the room dividing doors [Fig 236], function to clearly distinguish these elements to improve visual perception and aid people in distinguishing between elements.

Fig 239: Interior perspective of the primary space of Dwelling 4 illustrating the contrasting floor, wall and roof material utilised.

The second condition is Self-worth. One architectural method of achieving this is to provide high quality spaces which require little to no maintenance. This is achieved within these dwellings by utilising external roof and wall claddings which are durable,

high quality and long lasting. In all four dwellings standing seam zinc roofing is utilised. The 35° pitch roof with the durable and long lasting material means that little patch up work is required. Vertically laid cedar slats in a variety of widths function as a

NORTH ELEVATION

EAST ELEVATION

Fig 240: External elevations illustrate the materiality and forms utilised for Dwelling 1

NORTH ELEVATION

EAST ELEVATION

Fig 241: External elevations illustrate the materiality and forms utilised for Dwelling 2

weather screen and maintains its appearance over time. The material palette utilised requires little maintenance on the part of the occupant and is expected to age gracefully, with the cedar expected to grey up over time and the form and colour of the

roof is expected to be retained for a long time. These materials are used in place of fibre cement or plasterboard cladding and tiled or low pitched roofs, which are commonly used in the suburban environment within which this dwelling sits.

SOUTH ELEVATION

WEST ELEVATION

SOUTH ELEVATION

WEST ELEVATION

NORTH ELEVATION

EAST ELEVATION

Fig 242: External elevations illustrate the materiality and forms utilised for Dwelling 3

NORTH ELEVATION

EAST ELEVATION

Fig 243: External elevations illustrate the materiality and forms utilised for Dwelling 4

SOUTH ELEVATION

WEST ELEVATION

SOUTH ELEVATION

WEST ELEVATION

A secondary method of maximising self-worth is to celebrate each living activity to maximise quality of life. A variety of architectural elements are included within the dwellings which intend to create architectural moments which celebrate each living activity. These moments are influenced by spatial form, natural lighting, and views out. The use of skylights in certain locations, maximises natural daylight into the spaces, and works to lighten the spaces as much as possible. All four bathrooms

Fig 244: Shower space of Dwelling 1 illustrates the elements utilised enable elderly occupants to use the shower.

have skylights above shower spaces to allow natural light to stream down onto the occupant when showering and allowing skyward views out. This transposes the typical and expected spatial experience of bathrooms which tend to not relate to the exterior of a dwelling. As illustrated the arrangement of these cleansing spaces have taken into account the requirements of a wide variety of people at various stages in their age and health [Figs 244, 245 & 246].

Fig 245: Shower space of Dwelling 3 illustrates the elements utilised enable occupants with physical diminishment to use the shower.

Fig 246: Shower space of Dwelling 4 illustrates the elements utilised enable those occupants without physical diminishment an enjoyable experience.

Exposing the underside of changing roof forms enables a variety of spatial experiences throughout the dwelling [Figs 232-239 & 244-249]. Living and sleeping spaces are opened up vertically, which increases the perceived sizes of these spaces [Figs 247-249]. The open plan spatial arrangement which is utilised maximises spatial openness and connections between the spaces. Large amounts of glazing are used to encourage views out onto the surrounding area to experience what is going on externally.

Fig 247: Bedroom of Dwelling 1 illustrates the unique spatial experience created by exposing the underside of the roof form.

Fig 248: Living space of Dwelling 2 illustrates the unique spatial experience created by exposing the underside of the roof form.

Fig 249: Living space of Dwelling 4 illustrates the unique spatial experience created by exposing the underside of the roof form.

The third condition is Solitude. All the dwellings should become a haven, where privacy and security of the occupant is ensured. It is important that the dwellings provide the occupant with progressive levels of privacy to limit any exposure or vulnerability the occupant may experience. The architectural mechanisms which attempt to ensure solitude include the clear definition of thresholds between inside and outside in the form of texture and materiality changes upon entrance onto the site and into the dwellings. These dwellings utilise a variety of material and texture changes, to ensure that their properties are clearly defined. The use of reinforced grass paving at the entrance of each dwelling, functions as a space of car parking, whilst also clearly delineates where the public footpath ends and the private property begins [Figs 251-254]. These dwellings utilise their street frontage boundary walls as the separation mechanism in place of more commonly found garden fences, planting and setbacks [Fig 250]. This pushes the dwellings relatively close to the site perimeters which enable a large central shared area to be created. Each of the 4 dwellings functions as the separation mechanisms for the shared central area. By pushing the dwellings to the site boundaries, one runs the risk of exposing the dwellings to visual penetration from passers-by and limiting privacy. However, this has been considered in the spatial layouts of the dwellings. Spaces which flank street frontages with glazed openings are entrance areas and kitchens. The proportions and locations of the glazing openings have been considered so as to limit views into the dwellings from public, whilst maximising visibility out

for the occupants of the dwellings. This enables the occupants to passively survey what is occurring outside whilst they carry out living activities such as cooking and washing up [Fig 250]. All other street frontage openings are either small rectangular

openings, which function as backlighting for shelving units, are at high level, or are roof lights which enable light and views in, without the risk of the public seeing into the dwellings.

Fig 250: Relationship of Dwelling 1 and 2 to the street. The exterior walls of these dwellings function as the fencing element to the public.

Fig 251: Contrasting ground treatment for Dwelling 1 used to passively indicate the threshold between public and private property.

Fig 253: Contrasting ground treatment for Dwelling 3 used to passively indicate the threshold between public and private property.

Fig 252: Contrasting ground treatment for Dwelling 2 used to passively indicate the threshold between public and private property.

Fig 254: Contrasting ground treatment for Dwelling 4 used to passively indicate the threshold between public and private property.

The fourth condition is Social power. It is vital that these dwellings intentionally omit architectural elements which illustrate any physical shortcomings which could stigmatise ageing occupants as deviating from conventional function. This is achieved by eliminating the tacked on, single use architectural elements which have become common place aid devices for the elderly. Intentionally omitted from the dwelling's designs are tacked on access ramps, hand rails, fold down shower seats, stair lifts and home elevators. The dwellings illustrate the importance of integrating design elements which are multi-functional to help elderly occupants with any deficiency that may occur, whilst also usefully functioning for other demographic groups. The shelves of the bathroom vanity, which is placed directly next to the toilet, function as storage space whilst doubling as a physical aid in getting off the toilet if at any time the occupant requires [Fig 244]. The integrated seats found within the large walk-in showers, enables someone with restricted mobility to shower independently, whilst still being used by more able bodied occupants to enable a more relaxing cleansing experience, as well as being used for storing shower products [Figs 244,245 & 246].

The fifth condition is Individuality. It is vital that these dwellings enable self-expression of the occupants and limit the chance of objectification and homogenisation of the occupant's living environment. Architectural methods to achieve this include enabling the occupant to dictate how they use the spaces. This has been attempted within these dwellings through the

elimination of standardised single use room designations, and the design of polyvalent multipurpose spaces which allow the occupant to choose to sleep, eat, entertain, read and work in multiple areas. This becomes difficult in a small footprint dwelling, however the utilisation of an open plan living arrangement, the use of movable shelving units as soft room dividers, and sliding doors which can close and open up space allows the occupants of these dwellings maximum control over their space. Individuality is also maximised by the built forms of the dwellings themselves. Although it is important that the dwellings are sympathetic to the surrounding neighbourhood's domestic scale it is important to set these dwellings apart from the surrounding context [Fig 255]. This is achieved through the application of a material palette which departed from the traditional New Zealand suburban wall and roof cladding materials. Externally, the walls of all the dwellings are clad with a mix of a material palate consisting of unpainted vertically orientated cedar slats, and standing seam zinc in grey and red. The roof material is consistent across all four dwellings, standing seam zinc, but varying in colours. This material palette enables the dwellings to be differentiated from the surrounding context and from each other, whilst acknowledging the relationship they have to each other.

Fig 255: Perspective of the four dwellings in the suburban context. The forms and material palette utilised differentiate the dwellings from the surrounding context. The variation in form and materials enables the dwellings to also be differentiated from each other enabling individuality of the occupants.

Large shelving units are placed throughout the dwellings to enable the occupant to display and store a variety of their own belongings. Once these shelving units are filled up they function as room dividers which can flexibly and subtly separate spaces. These shelving units intentionally provide a number of varying size shelves and holes, to allow the occupant to display and store a variety of belongings [Fig 247 & 248]. Also included in these dwellings are wall based shelves which are a continuation of the roof ribs, down the wall. This shelving is placed against the southern walls in the dwellings, and a variety of voids are provided [Figs 229, 230, 231, 236 & 248].

The Sixth condition is health. The dwellings must support psychological and physiological benefits of the occupants. Maximising physiological health is achieved through using architectural elements which enable a warm and dry physical environment for the occupants. These elements include fully insulating the floor, walls and roof and utilising double glazed window units to minimise heat loss. Also the use of pendant lighting as opposed to recessed lighting into the ceiling minimises holes in the thermal envelope [Figs 232-239, 244-247, 248 & 249]. Each dwelling is orientated to maximise sunlight and daylight, with high amounts of north facing glazing and the use of skylights enables natural light to penetrate deep into each of the dwellings. Good ventilation channels are vital to maintaining a dry home, which is achieved by having openable windows on all facades and open-able skylights on the roof to enable

passive natural cross ventilation within each dwelling. Ceiling mounted fans are used to circulate warm air which rises, which is vital in these dwellings with expressed gable forms [Figs 233, 236, 239 & 249]. It is important that the dwellings support psychological health of the occupants, and a relationship with nature is a vital requirement to maximise psychological health. These dwellings provide access to private outdoor space, which are large balconies receiving afternoon and evening sun and give occupants space to undertake various living activities [Figs 256, 257, 258 & 258]. These outdoor spaces also provide a buffer zone between the interior of the dwellings and the shared outdoor space.

Centrally located between the four dwellings is a shared outdoor garden area [Fig 259]. This space emerged as an approach to maximise outdoor space by grouping what would otherwise be small outdoor spaces surrounding each of the dwellings. Having accessible outdoor space is an essential requirement to both the psychological and physiological health of all inhabitants. This area enables occupants to experience a multitude of activities, using the space for leisure, entertaining, planting vegetables, sitting, interacting, and playing. This space is accessed from all four dwellings and ownership is shared by all the inhabitants.

Fig 256: Outdoor area of Dwelling 1 which functions as a space for activities and a buffer between the interior and the shared garden

Fig 257: Outdoor area of Dwelling 3 which functions as a space for activities and a buffer between the interior and the shared garden

Fig 257: Outdoor area of Dwelling 2 which functions as a space for activities and a buffer between the interior and the shared garden

Fig 258: Outdoor area of Dwelling 4 which functions as a space for living activities.

Fig 259: Illustrating how the shared outdoor area provides space for a variety of living activities and a variety of occupant demographics.

A key psychological consideration that the dwellings must consider is that physical sickness becomes more common among the elderly, therefore the amount of time spent bedridden increases with age. The design of the dwellings must take this into consideration and understand the negative psychological impact this can have on the occupant. In typical house design in New Zealand, bedrooms are often separated from the living spaces, located either at the end of corridors, or up/down a level. However these dwellings take a different approach. In order to maintain psychological health, those undergoing physiological

diminishments and bedridden, should remain part of daily activity. Architecturally, this is achieved through the arrangement of spaces and the relationships they have to each other. The bedrooms are intentionally not segregated from the rest of the dwellings, and in fact become an integral part of the Dwellings. From the bed if the sliding door to the bedroom is open, the bedridden occupant can remain connected visually and audibly to the goings on within the home. This allows anybody confined to this space due to physical reasons, to still remain part of the household [Figs 260 & 261].

Fig 260: Sectional Perspective of Dwelling 1, illustrating the relationship between the bedroom and the living space, which enable bedridden occupants to remain connected visually and audibly to the goings on within the dwellings.

Fig 261: Sectional Perspective of Dwelling 3, illustrating the relationship between the bedroom and the living space, which enable bedridden occupants to remain connected visually and audibly to the goings on within the dwellings.

The seventh and final condition is ownership. This is important as financial ownership play a significant role in the enabling of an environment which one can associate with as “home.” These dwellings must provide an environment which people can relate to as their home.

This alternative new built living model is intended to be financially viable, therefore certain architectural elements have been included to maximise financial affordability, both upfront and on-going. The first method of achieving affordability is the purchase of two typical lots and re-subdivision into 4 lots. This is a method of increasing affordability for newly built homes. As the sites are about half of the typical lot size, the price of the lots is also halved. This has the potential to make building new a more accessible option for a larger group of people. The second method of achieving affordability is designing the dwellings to have relatively small footprints, as the costs of a home often correlates to the to the floor area. Therefore the internal floor areas range from 75m² to 120m², which is significantly lower than the average size of new homes currently being built in New Zealand

The third element utilised to encourage affordability is to ensure modest engineering requirements. This is achieved in these dwellings by utilising a simple gable form in a multitude of applications. This gable which forms a portal frame in one direction, with expressed shuttered concrete shear walls in the other direction creating simple structural lines. This keeps the upfront costs of the build relatively low making this living

option as viable and accessible as possible within New Zealand's mainstream housing market. The fourth element is ensuring low running costs for the occupants by incorporating energy efficient design principals at the time of the build. These principles include a small footprint, the ability to compartmentalise the dwellings into various spaces which can be heated independently, using concrete walls to retain heat as well orientating the dwelling to maximise solar gains. In a similar vein the fifth element is maintaining low on-going maintenance costs for the dwellings. This is achieved by utilising materials such as unpainted cedar board cladding and powder coated zinc roofing which require little upkeep. Utilising the steep 35 degree roof pitch minimises the chance of build-up and pooling on the roof, which lengthens the life of the roof. The materials utilised are of high quality, are therefore have a higher upfront cost than standard New Zealand cladding materials, however it is deemed necessary to incorporate materials which will have longevity to enable homes for life. It is also noted that in this scenario of building four dwellings at once, the materials for all four dwellings would be purchased at the same time to enable a lower

overall cost.

CONCLUSION OF DESIGN EXPLORATION 3- PROACTIVE NEW BUILD

To conclude, this design exploration presents an alternative viable architectural model to provide a multitude of living options for a range of demographic groups.

By providing four distinct dwellings which can cater to a wide range of demographics, life stages, and capabilities, these dwellings encourage social heterogeneity of the occupants. All dwellings have incorporated architectural features which enable the occupant to age in place, even as they undergo diminishments in old age. The 7 conditions of dignity have had significant influence on the design of each dwelling. Elements are incorporated which enable these 7 conditions to be present within the dwellings, which has a beneficial effect on enabling occupant dignity.

This design exploration proposed the construction of 4 small dwellings across two typical suburban sized lots and the design decisions implemented in this design exploration are able to be applied to achieve similar results in many scenarios throughout New Zealand. The proactive nature of the exploration illustrates a more holistic, long term view of housing. This exploration provides a range of dwellings which can cater to a wide variety of demographics and capabilities whilst enabling all occupants to

remain living in these homes as they age.

Although there are a variety of positive architectural attributes which illustrate the strengths of this exploration, the findings also illustrate limitations, which are equally as relevant to the discussion.

The siting of the exploration was intentionally set within a typical suburban environment to illustrate the applicability to places where most New Zealanders live. The garage space is intentionally omitted from the design of these dwellings in an attempt to stem the proliferation of car use. However, in siting the exploration within a suburban context, the model inherits a variety of issues common to suburban living. This includes the scarcity of public transport links and amenities which inherently increases dependence on the car. Therefore space for a car is necessary. This has been accommodated by a concrete/grass paved outdoor area located directly adjacent to the front doors of the dwellings for ease of access [Figs 251-254]. This approach, although valid, is expected to be perceived as unfavourable if comparing to the existing housing stock which has such a high prevalence of garage provision.

The exploration illustrates the dwellings being pushed on the edge of the site. This breaches the boundary restriction by building closer than 2 meters to the edge of the site. This has been done intentionally to maximise space within the shared area, however under existing restrictions would not be granted consent. Existing zoning laws throughout New Zealand would

most likely stifle a development of this type, which proposes a re-subdivision of already subdivided land, to build four dwellings on space assigned for 2 dwellings. Under current legislation the subdivision process is expected to be a relatively long and costly process. If this proposed living model is going to be successful, a re-think of legislation and intensification restrictions is required by Governing bodies.

This alternative new build living model, illustrates an approach to creating new homes which cater to the requirements of the a variety of demographics, whilst creating home environments which promote ageing in place for life to create living environments which incubate human dignity in old age. This has the potential to significantly increase the quality of life for a

growing number of ageing New Zealanders.

CHAPTER 7: CONCLUSION

New Zealand's ageing population will result in a massive quantitative increase in the amount of New Zealanders aged 65 and over. The composition of this group will also shift to consist primarily of Baby Boomers. This demographic shift is placing increasing salience on the ability of New Zealand's existing residential housing stock to provide environments conducive of dignity to an increasing number of New Zealanders. The problem identified that the condition of the existing architectural models which are expected to provide the home environments for this group are inadequate. Each illustrates a range of architectural deficiencies which has resulted in the conclusion that existing options will not enable occupants to age in place, or maintain dignity. If this problem is not addressed comprehensively there is a real possibility that ageing New Zealanders will experience a significant decline in dignity as they age, which would have detrimental effects on psychological and physiological well being. The main intention of the research was the development of alternative architectural models which would function to increase the amount and quality of residential dwellings in New Zealand to enable more ageing occupants to age in place and with dignity.

Existing precedents of alternative architectural models designed to provide housing for the elderly illustrate *reactive* responses. These environments exist as a reactionary attempts to cater to occupants who have already undergone the diminishments associated with ageing. The resulting dwellings often then become labelled as "specialist elderly houses," and become expensive to acquire, resulting in the exclusion of many elderly New Zealanders. In response to this, the three design explorations undertaken all utilise a *proactive* approach, which advocates for dwellings which incorporate design elements which minimise the impact of the diminishments associated with ageing before they occur. Retrofitting typical examples of two of the most prolific housing typologies in New Zealand illustrates that by making certain changes to these dwellings, these houses are able to be re-purposed to provide residences for a range of demographic groups. This enables a range of occupants to age in place and retain dignity as they do so.

It was important that each of the designs explored common architectural scenarios in order to propose applicable architectural alternatives. This significantly influenced the selection of dwellings for exploration. The most common residential typologies - the State House and the McMansion; which account for 50% of the housing stock, were selected to retrofit; as the significant architectural findings would be able to be applied in many other instances. It was therefore vital that archetypal examples of each typology were selected and research

into typical attributes and distribution of various typologies was undertaken prior to selecting the sites. Architectural challenges emerged from the decision to intensify the existing suburban situation. As individual sites are locked in their proportions, multiplying the amount of dwellings on each raised significant issues of space provision. The first two explorations explore the concept of semi-attached living, which is not currently a prevalent model within New Zealand's suburban contexts.

The three design explorations undertaken, propose alternative architectural solutions which could increase the number of dwellings in New Zealand which enable dignity in old age. A review of relevant literature concluded that dignity in old age was the most vital determinant to ensure the well being of ageing New Zealanders. The concept of dignity is seldom defined, nor could a pre-existing architectural framework for dignity be located. It was vital then, that a framework which outlined the determinants of dignity be established and applied to all three explorations. Informed by Birnbacher's polarities of Human dignity, seven key conditions of dignity were constructed. In order to provide dignity in old age to be enabled each of these conditions; Capacity, Social Power, Self worth, Solitude, Individuality, Health & Ownership, must be present within the built environment. Each of these conditions has architectural mechanisms and spatial techniques which encourages these conditions to occur [Pages 45-51]. The three design explorations engaged these architectural elements and mechanisms in

order provide the seven conditions of dignity. Once the seven conditions of dignity are present, the dwelling is said to enable dignity. If these architectural mechanisms outlined in the framework are applied to similar dwellings throughout New Zealand it has the potential to increase the number of dwellings which would enable more people to age in place, with dignity, whilst reducing the demand for more traditional elderly specific communities and institutions, which in their current architectural forms are detrimental to human dignity.

The identification of limitations to the research is an imperative component as they illustrate where improvements can be made. Dignity is a significant component within this research. It has informed the lens through which the critique of existing models were undertaken, as well as impacted the architectural outcomes. Although best efforts have been made to define and quantify architecturally how this human construct can be enabled within the built environment, this framework can only ever function as a guideline. It must be acknowledged that individuals will undoubtedly place increased significance on certain conditions of dignity over others, depending on personal preferences and personal situations. This has the potential to result in watered down designs, whereby favourable conditions of dignity are incorporated. This will be difficult to avoid, so it is important to stress the fact that the framework should be considered in its entirety.

The intentional decision made to focus on suburban dwellings for the design explorations, brings with it the inherent deficiencies of suburban dwellings, and are seen as limitations of the explorations. These include scarcity of public transport links and amenities in the immediate areas of each of the explorations, which proliferates the existing high level of dependence on cars for transport.

Undertaking the proposed alteration and building works illustrated in the architectural explorations would require a significant financial investment. This has the potential to effectively limit those who can utilise these approaches to those who own their homes. Methods of increasing the affordability of dwellings is advocated for in the framework, however ownership rates remain a potential limitation to these explorations being undertaken.

Convincing mainstream New Zealanders of the merits of the unconventional architectural environments illustrated in the design explorations is expected to be a challenge. The proposal of semi-attached dwellings with smaller areas, on smaller sites, directly contrasts with the New Zealand suburban dream of large detached homes on large sites, which still seems a sought after dream for many. Even though this may be challenging it is important to illustrate that priorities need to change in order to provide dwellings which can cater to the changing context.

Existing subdivision laws and boundary encroachment laws are identified as significant limitations, as in their current forms

these rules would prevent the types of proposed developments from proceeding. These laws exist to repel speculators, and ensure access to resources. However, in a future context, where housing requirements are changing, the role of National and Regional Governing bodies could be significant. If these agencies understand the benefits that the proposed models illustrate, they could encourage the uptake through the use of incentive schemes and tax relief for those undertaking such developments.

Although these limitations are identified, there is a strong case made for the implementation of the architectural mechanisms which enable dignity of ageing occupant advocated for in the framework and illustrated in the proposed models. The explorations have tested the applicability of the architectural framework, and each of these exploration presents an architectural alternative which provides dwellings which cater to as wider variation of demographics as possible. This social heterogeneity, and increased affordability are seen to be beneficial.

Potential avenues of further research include methods to solve the outlined limitations. Valuable exercises include; increase public transport provision to suburbs, create more accessible home ownership models, change mainstream New Zealanders ingrained negative perceptions of space efficient and intensified housing types, and instigating amendments of subdivision and boundary laws with Governing bodies. Also relevant would be

the application of the framework to a wider range of dwellings, including an inner city high density residential environment, which would function to further test the robustness of the architectural approach and refine the framework. Although demographic groups to inhabit the dwellings are suggested, these occupants are purely speculative, and any further research would benefit from the involvement and input of stakeholders throughout the design process of these design explorations.

The research asserts that waiting until housing environments are inappropriate for an ageing occupants requirements before action is taken, either in the form of a reactive retrofit or the move to a more appropriate dwelling, is not the most effective approach to dealing with housing provision in a future context with an ageing population. Utilising approaches which are proactive in nature, for both new builds and retrofits alike, which incorporate mechanisms and principles to minimise the impact of diminishments of ageing before they occur is proposed as the most effective architectural approach.

This thesis has proposed viable options which are applicable to a wide range of architectural situations to enable an increase in the number of dwellings which enable ageing New Zealanders to age in place, and with dignity. These design explorations also diversify the type of suburban housing stock to provide dwellings for a

wider variety of demographic groups.

Architects and designers, who have considerable influence on the built environment, need to consider the impact that the decisions they make can have on the quality of life of a growing portion of New Zealand population.

A conclusion of this research is that designing the perfect architectural solution for ageing occupants is impossible, as this solution does not exist. The best dwelling for an ageing occupant is not one designed specifically for the elderly, but one which understands ageing as an inevitable process which will happen to everyone. The design explorations utilise design strategies which depart from mainstream approaches to provide flexible and dynamic home environments which are able react to changing social circumstances and provide spatial arrangements which preempt the possibility of physical diminishment in old age to enable all New Zealanders to age in place with dignity.

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