



# Engagement in the Landscape:

An innovative approach to stimulate  
engagement in the outdoors for those  
suffering from Alzheimer's Disease

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# Engagement in the Landscape

An innovative approach to stimulate engagement  
in the outdoors for those suffering form Alzheimer's  
Disease


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Accepted and Approved By:

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To the individuals and families that have been  
affected Alzheimer's disease,  
Your woes are not unheard and hope yet remains.



# Abstract

Alzheimer's disease (AD) is projected to afflict nearly 14 million people by the year 2050, almost triple the amount of what it is today. Longer life spans and population aging are both major culprits in the consistent increase of incidence rates for AD. Some studies have shown that individuals with AD spend a majority of their time unengaged and inactive, leading to a worsening of cognitive functioning and behavioral symptoms. Due to the improbability of a cure in the foreseeable future and the insufficient standards in the memory care environment, the need for innovative non-pharmacological strategies is of foremost importance. Through expansive literature review, observational sessions and interviews with professionals, my goal was to improve this insufficient standard of life by devising a set of landscape guidelines that demonstrate how to effectively engage individuals with AD. These guidelines rely on the Comprehensive Process Model of Engagement for applying environmental, stimulus and personal attributes in the outdoor space and are contingent upon an application of a personality model in order to inform the reader how to implement appropriate strategies. Furthermore, this set of guidelines are followed by a conceptual design inventory in order to provide examples of how these guidelines can be envisioned in the outdoor space. This project aims to enable either the designer, caretaker or memory care facility owner to activate the outdoor space to better engage the afflicted individual and improve overall quality of life.

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to influence people's lives for the better.

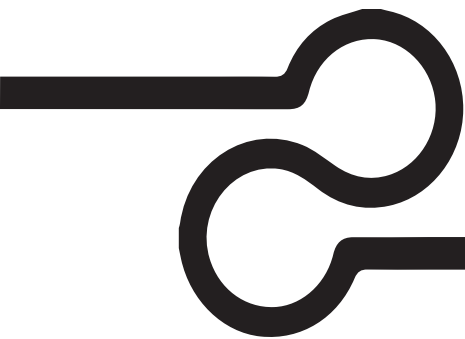
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what it means to care.





# Introduction

## Project Purpose

Although difficult to define, the term 'quality of life' is an illusive measure that describes an individual's level of happiness, comfort and well-being. In today's results-driven world, we are so frequently consumed by the prospect of the end goal that we tend to neglect the process. It is in this same vein that we do everything in our power to keep people alive that we often forget to give them a reason to live. Over the past few decades, as the world population grows and people live longer, healthier lives, AD has played a major role in shaping the quality of life for the elderly. As social interactions degrade, the ability to recall defining experiences fades and the capacity to think clearly becomes increasingly difficult, the quality of life for individuals who live with AD quickly decays. Despite the current needs of these individuals, high rates of passivity and meaningless engagement demonstrate an insufficiency in effective strategies and appropriate living environments.

It is for this reason that I propose to analyze the various strategies that are utilized to promote engagement in individuals suffering from cognitive decline and apply them to a set of landscape guidelines. In order to do so, I will explore the fields of neurobiology, psychology and design to better understand the disease's underlying causes, pathology and epidemiology as well as its progression, its psychological and behavioral effects and how current approaches aim to solve the degradation of the individual's quality of life. These details will help to inform my guidelines and serves as the foundation on which they will be constructed. Furthermore, I aim to grant these guidelines a sense of tangibility and clarity by creating a set of illustrations that will serve as a conceptual inventory to provide examples on how to implement the strategies set forth in the guidelines. I hope for this project to improve the standards in which landscapes used by individuals with AD are designed, leading to an improved quality of life for those need it most.

# An Overview of Alzheimer's Disease

## *Population Aging and Its Implications on AD*

Over the past two decades, the world's population has been undergoing a dramatic shift in its age structure. Due to a decreasing rate of fertility and an increase in life expectancies, the share of older people has increased from 9 percent in 1994 to 12 percent in 2014, and is expected to reach 21 percent by 2050 (United Nations, 2014). This phenomenon by which older people (aged 60 years and older) become a proportionally larger share of the total population is known as population aging. When compounded with an annual population growth of 1 percent, more and more individuals are entering the 60 and older age range and are ultimately disrupting the balance of age distribution (Roser & Ortiz-Ospina, 2017). This uneven distribution of global age structures has major implications on AD incidence rates as AD disproportionately affects older individuals. Furthermore, these worrying population trends will impact "economic growth, economic security in old age, the organization of health care systems and the strength of familial support systems", further justifying the necessity for an improvement of senior care policy (United Nations, 2014, pg. 24).

U.S. Population Aged 65+ (Millions)

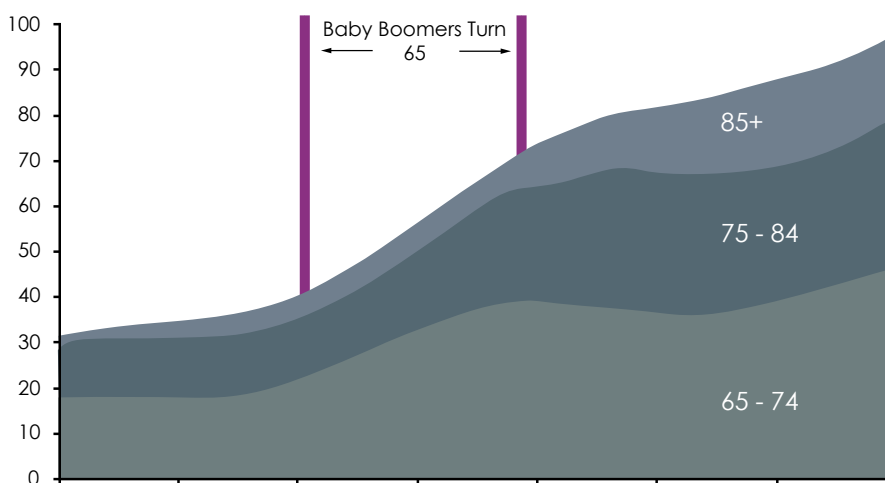


Figure 1: Percentage of older persons (65+ years old) within the total population

Information retrieved from pgpf.org

In the face of an aging population, the rate of chronic diseases (including AD) is expected to steadily increase over the next 30 years. However, while the

prevalence of chronic disease is increasing, there has been a major discrepancy in percentage changes in selected causes of deaths due to chronic disease over the past two decades.

While the mortality rate of chronic diseases, such as stroke and heart disease, has decreased by 21 percent and 14 percent respectively between 2000 and 2014, deaths from

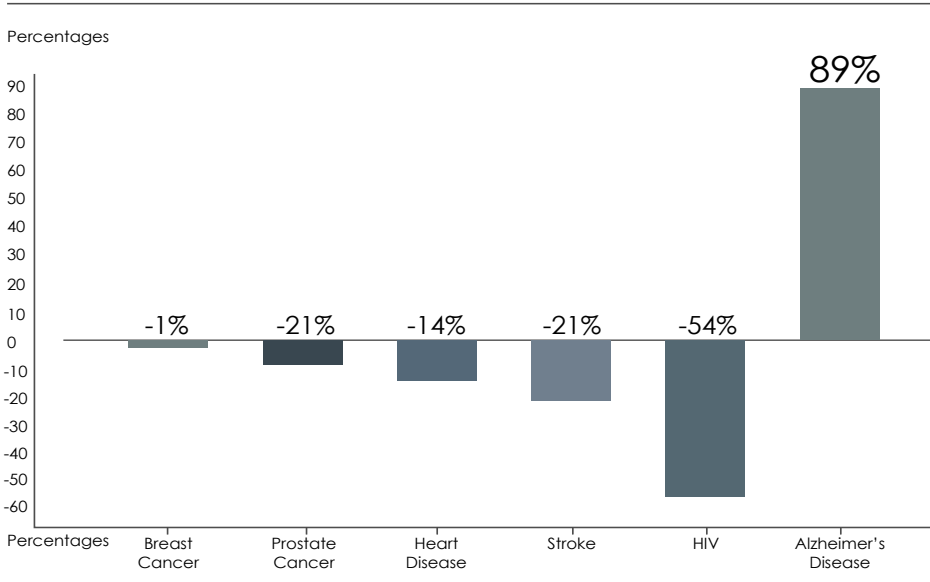


Figure 2: Percentage Changes in Selected Causes of Death (All Ages) Between 2000 and 2014  
Information gathered at alz.org.

Alzheimer's increased 89 percent (Kochanek et al., 2016). With an upward trend in mortality rates, AD has become the 6th leading cause of death and the 5th leading cause of death for individuals over the age of 65 in the United States (Center for Disease Control and Prevention, 2015). This will only rise as the number of individuals expected to be diagnosed with the neurodegenerative disease is expected to triple by the year 2050 to 14 million people ("2017 Alzheimer's Disease Facts and Figures", 2017).

These statistics demonstrate that innovations in medical technology and practice have made incredible progress in the prevention and treatment of other major chronic diseases while there is still much to be done for those suffering from AD. Considering the upward trend in Alzheimer's incidence rates and the increasing life expectancies of the older population, individuals will continue to be a significant portion of our population and must be accommodated for.

## Disease Progression

Alzheimer's disease (AD) is a degenerative brain disease in which progressive decline in cognitive function is the primary clinical manifestation. AD is the most common form of dementia, accounting for 60 to 80 percent of all dementia cases (Alzheimer's Association, 2017). Dementia refers not to a single disease but "to a number of syndromes characterized by diverse behavioral, cognitive, and emotional impairments" (Chapman, Daniel P, et al., 2006). Just as individuals can differ, so can the symptoms that are associated with AD, making it a very personal and emotional draining ailment. However, the process of cognitive decline for nearly every individual suffering from AD follows a similar trajectory in that it can be categorized into three separate stages (Harvard Health Publishing, 2011). The stages are as follows:

- *Pre-clinical* - The earliest stage of AD, the pre-clinical stage is characterized by symptoms that are absent or so subtle as to go undetected.
- *Mild Cognitive Impairment (MCI)* - The intermediate stage of AD, MCI is characterized by the a slight but noticeable and measurable decline in cognitive abilities.
- *Dementia due to Alzheimer's Disease* - The most severe stage of AD, Alzheimer's dementia is characterized by a level of progression in which memory, thinking and behavior are so impaired that individual can no longer function independently.

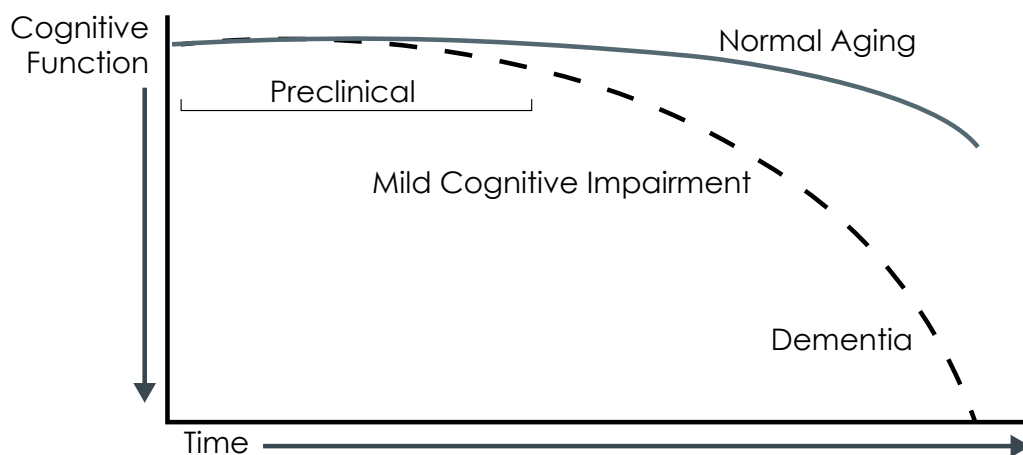


Figure 3: Model of the Clinical Trajectory of Alzheimer's Disease  
Information gathered at alz.org.

Although the manner in which the disease affects the individual differs on a case-by-case basis, the diagnostic criteria for those entering the latter stages of the disease typically involves impairment on at least two of the following cognitive domains: memory, executive function, visuospatial ability, language, behavior and personality (Petersen, Ronald C., et al., 2013). The symptoms associated with the decline of these cognitive domains may not appear for years, or even decades, after the initial pathological changes that underlie AD, making it an incredibly gradual progression.

## *Epidemiology, Pathogenesis and Risk Factors*

Over the past 20 years, researchers have made great strides in the area of AD with respect to etiology, diagnosis, prevention and treatment. However, because the exact cause of the disease is still unknown and highly debated, definitive diagnosis can only be made postmortem and current pharmacological treatment do little besides slowing the progression of the disease temporarily (Defina, Philip A., et al., 2013). What research has shown is that diseased brains are generally characterized by a degradation of the centers of the brain structures responsible for memory, primarily the entorhinal cortex and the hippocampus. The disease eventually leads into massive cell death and tissue loss in the frontal, temporal and parietal lobes, areas of the brain responsible for comprehension of speech, reception and correlation of sensory information, behavior and the learning of new information. (Braak, H. & E. Braak, 1991).

The current theory that describes these pathological changes in the brain is the amyloid cascade hypothesis, which posits that neurodegeneration in AD may be caused by the excessive accumulation of both the protein fragment known as beta-amyloid and neurofibrillary tangles (NFTs). Together, the excess depositions of these two proteins cause neuronal damage due to blockages in nutrient transport, disruption of neuronal communication between synapses and brain inflammation (Hardy, 2002; Burns, et al. 2008; "2017 Alzheimer's Disease Facts and Figures, 2017).

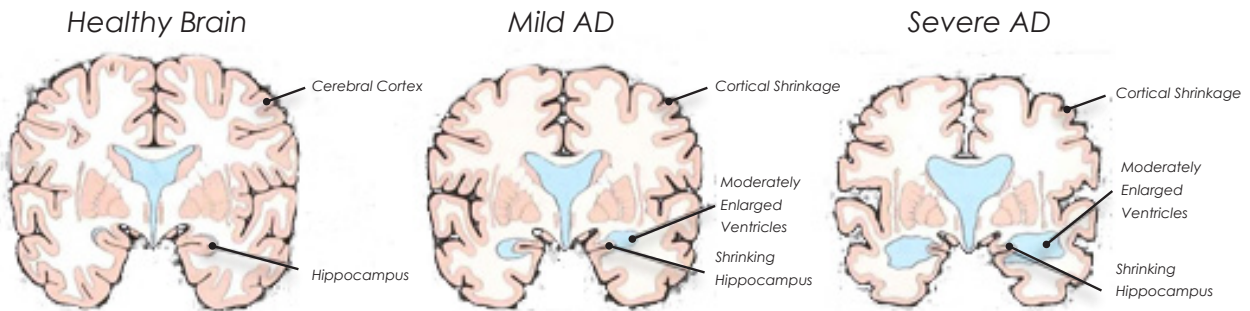


Figure 4: How the Brain Changes During Alzheimer's Disease  
 Image and information gathered at memorylanecottage.com.

Although there is some uncertainty surrounding the causes of AD are still undetermined, scientists and researchers have been able to identify several associated risk factors that are linked with greater likelihood of developing late onset-AD. Not all associated risk factors are equal however; in determining the likelihood of developing late-onset AD, older age, family history and carrying the apolipoprotein E (APOE)-e4 top the list. (Fratiglioni, Laura et al., 2004; Loy, CT, et al., 2013; Hotlzmanm, D.M., et al., 2012) Other risk factors include female gender, low educational attainment, low premorbid intelligence, sleep disorders, prior head injury, estrogen replacement as well as vascular risk factors including diabetes and hypertension (Burns, Alistair S., et al., 2005).

### *Behavioral and Psychological Symptoms in AD*

Alzheimer's disease and its progressive nature is unstoppable, hardly manageable and an immense burden on anyone who suffers from the disease. The inevitable pathological changes in the brain lead individuals to feel helpless, powerless and alone. Although it is defined as a cognitive disease, almost all people diagnosed with AD will develop neuropsychiatric symptoms at some stage of their disease (Lyketsos, et al. 2011). These neuropsychiatric symptoms include apathy, depression, aggression, agitation, sleep disruption and psychosis and are now recognized as core symptoms of AD. Population-based studies show that the frequency of these symptoms are much higher in those who suffer from intermediate and late stages of AD than in the general population (Lyketsos, et al., 2002). The resulting neuropsychiatric symptoms due to neurodegeneration not only have immense ramifications on cognitive abilities

but also have major adverse effects on daily functioning and quality of life. According to the Alzheimer's Association, the ten most common signs that result in the inability for an individual to function normally are as follows:

1. **Memory loss that disrupts daily life** such as the inability to remember new information, forgetting important dates and a heavy reliance on memory aids.
2. **Challenges in planning or solving problems** can lead to difficulties in developing and following a plan, concentrating and taking excessive amounts of time to do things they have done numerous times before.
3. **Difficulty completing familiar tasks** can take the form of an inability to drive or walk to a familiar location, managing a budget at work or remembering the rules of a favorite game or activity.
4. **Confusions with time or place** often result in losing track of dates, seasons and the passage of time. As progression worsens, individuals frequently forget where they are or how they got there.
5. **Trouble understanding visual images and spatial relationships** can lead to having vision issues leading to a difficulty reading, judging distance and determining color or contrast.
6. **Difficulty with written and/or verbal communication** may often result in an individual having trouble following or joining a conversation. They may struggle with finding the appropriate word or call something by the wrong name.
7. **Misplacing things and losing the ability** to retrace steps is demonstrated when individuals put items in unusual places or lose things frequently and may result in the individual accusing others of stealing.
8. **Decreased or poor judgment** is exemplified when the individual struggles managing with money, cleanliness and personal health.
9. **Withdrawal from work or social activities** occurs when an individual begins to remove themselves from hobbies, social activities, work projects or sports. Individuals may also avoid being social due to the



cognitive changes they have undergone.

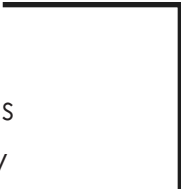
**10. Changes in mood and personality** may derive from confusion, suspicious, depression, fear or anxiety.

A comprehension of how the disease affects the individual is imperative in order to better understand how to effectively accommodate for the individuals affected by it. Made apparent by the symptoms above, AD is an incredibly personal disease that doesn't necessarily have tangible, physical ramifications; rather it slowly rids the individual of their identity and independence, leaving them helpless in the face of a degenerating quality of life. Not only do these symptoms gravely impact the life of the individual who is afflicted, these manifestations of AD also have major adverse effects on caregivers, the backbone of memory care (Okura, Toru & Langa, 2011).

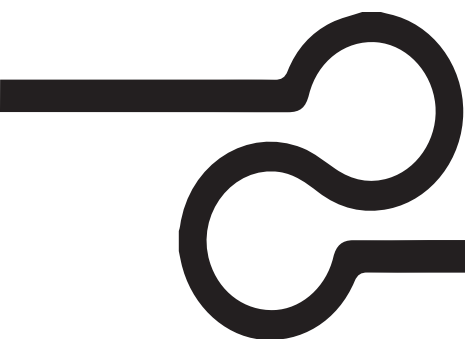
### *The Caregiver's Burden*

Whether psychological, physical or economic, major burdens are placed on the individuals who are responsible for maintaining the quality of life for those suffering from cognitive decline. This is especially true for individuals who provide informal, unpaid care for a family member or loved one, whom constitute 83 percent of all help provided to older adults in the United States (Friedman, et al., 2015). More than 15 million unpaid caregivers, two-thirds of which are women, lack resources, training, must take time away from work, are inundated with medical costs and suffer from emotional and physical strains on a daily basis ("2017 Alzheimer's Disease Facts and Figures", 2017). They are the unseen yet significant portion of our population that are in desperate need of aid and support.

Whether unpaid or professional, care-giving and its influences on quality of life is a two way street for both the caregiver and the individual with AD. Studies have shown that increased caregiver burden is directly related to increased levels of behavior disturbance among residents (Coen et al., 1997). Not only is this a significant influence on the quality of life for the resident



and caregiver but caregiver burden caused by behavioral disturbances has also been associated with adverse psychological reactions, higher mortality rates (among caregivers) and impaired judgment on the functional abilities of the resident (Schulz, Richard & Beach, 1999; Arguelles et al., 2001). These studies depict an image of an unnoticed and unaccounted for portion of the population that are in desperate need of aid in the struggle against AD.



Background

## Theoretical Underpinnings

In order to understand how and why the memory care landscape has the opportunity to improve the quality of life for those who may benefit, it was vital that I explored the theoretical underpinnings of the therapeutic and engagement properties of the landscape. These theoretical foundations include the Theory of Biophilia and the Attention Restoration Theory. These theories help demonstrate the idea that the landscape serves a multi-functional purpose and that their incorporation into spaces that serve to rehabilitate is a vital part of the healthcare design process.

### *Theory of Biophilia*

The theory of biophilia's primary claim describes "the innately emotional affiliation of human beings to other living organisms" (Wilson, p 31). It is this innate tendency to seek nature and other forms of life that Wilson claims is a part of being human and ingrained into each of our individual subconscious. Theorizing that on a biological level, there is an inherent "love of life" and that despite evolution and changes in habitat, humans still perceive the environment with values of comfort and enjoyment which have profound influences on the emotional and psychological state of the individual. The perception of an individual's environment has a noticeable influence on the brain and sensory system which explains in part how the mental and physical health of those living within densely urban environments deteriorates as a result of stress and fatigue. Wilson argues that rapid urbanization has isolated a large percentage of the population from nature allowing for a number of social and environmental issues. This in turn creates a need for a greater level of nature incorporated into the built environment. It is this innate need for a greater connection to nature and the potential benefits derived from satisfying this foundational desire that I have come to build my studies on. The research and studies derived from this theoretical framework ground the essence of my goals in reality and provide a solid foundation on which to build.

## *Attention Restoration Theory*

The theory of Attention Restoration, established by Stephen and Rachel Kaplan, suggests that mental fatigue and concentration can be improved by higher levels of access to nature and the outdoors. It is based on the concept that “positive distraction” and “soft fascination” through engagement in the natural environment leads to the restoration of cognitive and psychological faculties from the stress caused by “directed attention”(Kaplan, pg 173). Kaplan’s theory claims that as urban lifestyles become increasingly prevalent in modern society, individuals living in such an environment encounter increased demands on directed attention, which may be linked to attention fatigue. Kaplan proceeds to claim that the solution to this issue is by taking time away from the attention-demanding tasks of modern day life and supplement it with increased time spent in the natural environment. This would demand less of our cognitive resources and enable the individual to recover his or her attentional capacities, otherwise individuals are susceptible to attentional fatigue. The potential of attentional fatigue is an important issue to address due to its association with poor decision making and lower levels of self-control. Considering the propensity for an individual suffering from Alzheimer’s to have impaired judgment and decision making, this theory ties directly into the need to provide an effective and engaging outdoor environment. Individuals suffering from Alzheimer’s are more likely to demonstrate shifts in moods as the processes that are engaged to perform even the simplest tasks are increasingly strained and more difficult to access. This idea alone makes the proposal of a designing an outdoor space for a memory care facility justifiable and worth exploring.

## Case Studies

The following case studies cover the spectrum of therapeutic landscapes including the design of a horticultural therapy space within a botanical garden in Cleveland, Ohio, a rooftop garden for a memory care facility in England and a historical look at an Alzheimer’s center in Ohio. The Elizabeth and Nona Evans Restorative Garden was constructed within the existing site of the Cleveland

Botanical Garden and provides an excellent example of how it is possible to design a space that not only provides sensory stimulation in a variety of ways but also demonstrates how a space can accommodate all kinds of people. The James Terry Court memory care facility demonstrates how modern aesthetics and design can be integrated within the healthcare field in a seamless manner. However, its downfalls illustrate the necessity for one to pay careful attention to the likely consequences of their design and how one should think about the nuances of designing for such a complex population. Lastly, the Alois Alzheimer's Center provides insight into the recent past and how design for mental care has developed over the years. The site itself demonstrates the necessity for a facility to provide spaces that are accommodative to the wide variety of its residences. Overall, the case studies served to inform my process of developing the guidelines and landscape components, providing multiple perspectives, approaches and insights into therapeutic landscape designs.

### *Elizabeth and Nona Evans Restorative Garden*



Location: Cleveland, Ohio  
Date: 2006  
Size: 12,000 SF  
Designer: Dirtworks, PC, New York, New York  
Client: Cleveland Botanical Garden

Figure 5: Elizabeth and Nona Evans Restorative Garden  
Image retrieved from <http://www.cbgarden.org>.

This “restorative treasure” is a picturesque design on therapeutic landscape in that not only is it a space designed for the “special needs” population, it is a design for everyone (Knopp). Adjacent to a busy dining terrace and providing the main view for the Botanical Garden’s library, the small garden accommodates the full spectrum of human well-being. Articulated in a two-day charrette, a board of directors, staff and donors defined the parameters of the project seeking to create a garden that was “beautiful, natural, lush, green; a setting that offers a range of opportunities, choices and

experiences; a setting engaging and enriching for all who visited". This reflected the spirit of the garden's namesake, Elizabeth Evans, who believed that an "abundance of foliage, fragrances, blooms and trees are invaluable elements of a healing garden environment".

Considering the functionality of the garden as not only as a public space but as a healing garden for the special needs populations, communication and collaboration were vital to achieving a design that was responsive and sensitive to the both populations. Matters of security (real and perceived), psychological and physical needs, horticultural therapy requirements and site conditions, vegetation, materials and maintenance were all heavily considered and deliberately designed. The design took form in three parts including the: Contemplative Garden, Exploration Garden, and the Horticultural Therapy Garden. Characterized by minimalism and vulnerability, the Contemplative Garden serves to provide a quiet sanctuary and entrance into the site. The Exploration Garden, designed with the help of the Botanical Garden's Horticultural Therapist and Director, delves into the olfactory and tactile senses by implementing a variety of aromatic and diverse vegetation, provides ample room for both individual and group activity, and is excellent demonstration of how the landscape can activate the senses. Lastly, the Horticultural Therapy garden amplifies the aspects of the previous garden by heightening sensory stimulation with careful plant selection and aims to engage the users of the site by providing program space for its participants. Overall, the Elizabeth and Nona Evans Restorative Garden demonstrates the elegant interweaving of aesthetics, functionality and healthcare to provide a landscape that welcomes the whole spectrum of the human condition.



### *James Terry Court*

Location: South Croydon, UK  
Date: 2013  
Size: 5,000 sq ft  
Designer: PRP Architects  
Client: Royal Masonic Benevolent Institution

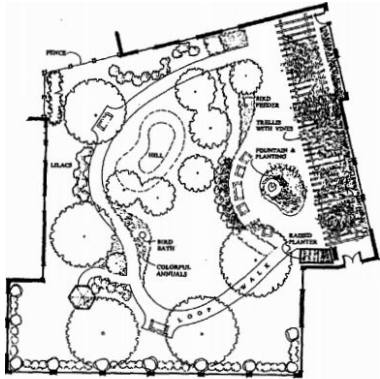
The rooftop garden on the James Terry Court Nursing home exhibits an aesthetic that is modernistic in nature yet is accompanied by a feeling of sensibility and warmth as it provides respite for the members of the memory care facility that reside below. In maximizing the availability of outdoor space, the roof garden offers an escape from the heavily developed site on the ground floor. In installing a healing garden on the roof of the healthcare facility, the design is novel in its approach while aiming to enhance the patient's sense of purpose, health and wellbeing by providing a safe, secure and holistic environment.

This site aims to be a reflection of the work done by the firm PRP and the guidelines they have set in place when designing healthcare facilities. In a set of strategies for the design of memory care facility, the firm created a design document meant to lead the design process. These strategies include establishing safe access, movement and orientation of the site, memory and mental mapping, sensory stimulation, shelter and shade, and lastly, planting strategies. To address safe access and movement, 1800mm (about 6 feet) height glazed balustrade and raised planters frame the area. The raised planters in particular not only allow for added protection and an insurance of safety, but they also allow the residents confined to a wheelchair to gain access to the plant material and activate their tactile senses. Although relatively geometric and linear in form, the essence of the circular pathway still characterizes movement in the site, allowing for the active engagement of the residents.

Although the intentions and guidelines in which the firm PRP established for memory care facilities is correct and well-informed, the implementation of their strategies falls short on multiple accounts. Although the planted trees were to provide shade for the area, the growth of the canopy will take years if not decades, resulting in the lack of immediate shade. Not only that but the lack of vegetated screening to prevent visual over-stimulation and the absence of frequent sitting areas demonstrate noticeable flaws with the design. Although successful in many aspects, the design also demonstrates the need for thoughtful attention to detail as the needs of dementia resident are as great as they are subtle.



## The Paradise Garden



Location: Cincinnati, Ohio

Date: 1987

Size: N/A

Designer: Beckwith Chapman Associates

Client: Alois Alzheimer Center

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Figure 7: The Paradise Garden

Image found at: [https://doi.org/10.1300/J016v22n01\\_02](https://doi.org/10.1300/J016v22n01_02)

Built in 1987, the Alois Alzheimer Center opened as a specialized facility dedicated to the care of individuals suffering from Alzheimer's and other dementia related diseases. Accommodating 82 residents, the center transformed to serve the needs of its residence by installing a series of therapeutic gardens, as a singular garden would not suffice. These include the Courtyard, the South Terrace and the West Garden and together they implement the essential elements of the therapeutic landscape.

### The Courtyard

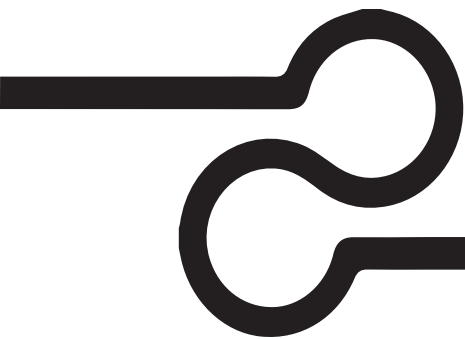
The Courtyard was the first garden to be constructed as visual access from inside the facility was one of the main therapeutic goals established. Another was the need for a loop path to accommodate wanderers and provide for a sinuous path for leisure while offering a variety of views and stimuli. The need for a loop path was needed to reduce disorientation and lead the patient back to the origin of their journey. Along with the loop path, the garden offers other standard strategies to engage dementia patients such as, raised planters to allow the stimulation of tactile and olfactory senses, an overhead trellis to provide shade, an integration of old fashioned plants and fragrant plants including peony, pansy, lavender, thyme and mint and lastly a gentle water feature to provide a soft background noise. The Courtyard serves to provide a space for the typical dementia resident, stimulating the senses while providing ample opportunity for movement.

## The South Terrace

The philosophy for this space was to provide an area for residents who lost a great deal of cognitive ability but remained very active and in some cases, with greater intensity than before. The path here is more limited and deliberate as it surrounds a hill or mound, providing an area in which to circumnavigate. A water feature acts as the focal point, drawing attention away from the fence and screen wall which secure the space. Shade is again implemented but in the form of a trellis with vine and with the help of the sunshine, it projects a stencil on the paving below. Similar in strategies but with slightly tuned design intentions, the space accommodates the need for one who has further progressed in the erosion of their cognitive abilities.

## The West Garden

The West Garden provides a space for those who are even further along in their cognitive and physical impairment by removing the loop path in lieu of an area that can accommodate wheelchairs and garden furniture. Emphasizing tactile sensations, as this is the last to erode, an emphasis is placed on plant selection, utilizing species such as dusty miller, lamb's ear and ornamental grasses. Overall, this offers another design alternative and shows a thoughtful consideration for whom the space is for.



# Methodology

# Data Collection

In order to design an effective set of design guidelines and strategies to better engage residents in the landscape, I utilized data and information gathered from various fields of literature, observational sessions and interviews. These sources of information were instrumental in creating an approach that may better suit the needs of caregivers to better engage the individuals they look after.

## *Relevant Literature*

From scientific studies to recounts of personal experience of patient care, relevant literature served as the foundation for my process and end product. In utilizing literature from the fields of design, neuroscience, physiology, psychology, occupational therapy, patient care and horticulture, I was able to devise a set of guidelines that pay careful attention to various needs and criteria. These pieces of literature aided in establishing a solid understanding of the disease and its effects on cognitive function, assisted in creating the process from which the guidelines were derived and provided a method of prescription for implementing appropriate strategies and conceptual designs.

## *Observations*

In order to better understand how residents function on a daily basis, interact with others and their environment as well as how effective certain spaces were in the landscape, I conducted various observational sessions at memory care facilities. In conducting my observational sessions, I took note of five separate elements: resident-environment interactions, resident-resident interactions, resident personality, functionality of outdoor spaces and caregiver engagement. Observational sessions occurred at the Revere Court Memory Care Facility in Sacramento, California, the Broadway Senior Living Facility in Roseville, California and the OPICA Adult Day Care facility in Los Angeles, California. These sessions were instrumental in informing the direction and parameters of the design guidelines as well as providing examples of what

kind of spaces within the context of the memory care landscape may prove effective. Below are the summary of notes from the observational sessions.

## Resident-Environment Interaction

The residents' interactions with their surroundings seemed to vary greatly based off the resident's interests and curiosities while seemed to be independent of the individual's progression level. The assumption was that due to the decline in visuospatial capabilities, engagement with their environment would be noticeably impaired as the individual showed greater, more severe symptoms of cognitive decline. However, instances of individuals with minor symptoms showed low interaction and engagement with their surroundings while those who showed more severe signs of progression were noticeably more engaged with their surroundings. The only exception was when an individual was in the extremely late stages of progression where physical and mental capabilities were nearly non-existent. Types of resident-environmental interactions observed included the following:

- Exploration and repetitive pacing (either for exercise or
- Dancing to music.
- Looking and touching of vegetation.
- Sitting to observe and converse.
- Use of rocking chairs.
- Interactions with activities, games and objects (including painting, object and clothing organization, bingo, etc.)
- Group exercises.

*Takeaway* - Resident-environment interactions more varied than anticipated but limited by the capabilities for the outdoor space to stimulate engagement. These observations support the idea that memory care landscape should tailor to diverse interests and be highly variable.

## Resident-Resident Interaction

Considering that isolation and social withdrawal are common consequences of progressive cognitive decline, it was not surprising that resident-resident interaction was minimal during my observational sessions. Most residents spent their time by themselves and away from other individuals. It was apparent that due to the varying degrees of AD progression, the ability for one resident to relate or converse with another was an incredibly difficult undertaking and thus unlikely. When resident-resident interactions occurred, it typically took the form of sitting or walking together with period of brief conversations. The areas within the memory care facilities did little to facilitate social interactions as gathering spaces were limited and unshaded, dining areas remained indoors and activity areas were not present.

*Takeaway* - Resident-resident interaction was sparse and restricted to individuals who felt they had something they something in common and could share with one another. The proper design of the landscape has the capacity to create commonalities between individuals and to stimulate social interactions amongst the residents. Outdoor spaces should be designed in such a way that it gives the residents the capacity to partake in a shared hobby, interest or activity.

## Resident Personality

Just as every healthy individual differs in interests, character traits, behaviors and personalities so do those who suffer from AD. Regardless of progression, the personalities of the residents, whether through observation or direct interaction with them was made apparent through their disposition, tendencies, apparent interests as well as their interactions with their surroundings, caregivers and other residents. The noted character traits and existing counterparts:

- **Introverted vs. Extroverted:** while some individuals were more likely to attempt to converse with myself, a caregiver or another resident, others were more reserved and exemplified timid, anti-social

personality traits.

- **Active vs. Passive:** residents demonstrated both a proclivity to engage in active pastimes such as walking, group exercises and dancing while others spent more time in leisurely activity such as viewing beautiful scenery and sitting listening to music.
- **Artistic vs. Task oriented:** discrepancies in interests were demonstrated via the type of tasks or activities the residents participated in. While others found satisfaction out of activities such as finger painting, other residents enjoyed tasks revolved around completing a chore like folding socks or organizing colored pins.
- **Curious vs. Disinterested:** while some residents were engaged in exploring the outdoor space, looking for hidden areas, foraging in vegetated planters, etc. others stuck to routine and familiarity.

*Takeaway* - More often than not, outdoor spaces were generic, bland and lacked opportunities for resident engagement. The landscape should provide opportunities for the individual to engage with their environment and other people in a way that tailors to their individual personality traits.

## Functionality of Outdoor Spaces

Curious to understand what made an outdoor space successful, my observational notes included the role and effectiveness of various landscape features. While some features were heavily utilized and effective in serving their role to the residents, other features fell short due to a multitude of reasons including a lack of maintenance, poor integration into the surrounding areas and lack of design forethought. The landscape features evaluated in my observational sessions are as follows:

- **Pathways** that were made from a hard material such as concrete or brick pavers, were under shade during the hotter parts of the day and were well maintained seemed to be effective and heavily utilized.

- **Shade Structures** were effective when they utilized roofing to provide shade and rain cover. Trellis structures that relied on foliage from vines were often left underutilized as they spaces underneath were far too hot for comfort.
- **Vegetated Planters** with a variety of multi-sensory species (scented, vibrant blooms, made pleasant sounds in the wind, etc.), were elevated to be in reach of foraging and picking and were well kept functioned as effective sources of engagement.
- **Water Features** provided pleasant sounds and ambiance to the space but were rarely observed or interacted with.
- **Common Areas** that were scattered, small in size and without shade were heavily underutilized. Common spaces that had a central focal point that could stimulate interest.
- **Sitting and Dining Areas** were functional and effective when placed under shade and along pathways, had arm and back rests for ease of movement and were ample in size to accommodate social settings.

*Takeaway* - Well-designed landscape features in the landscape can provide powerful opportunities to stimulate engagement with the environment, encourage social interactions and provide the opportunity for the individual to find satisfaction from their surroundings. These facets of the landscape cannot dictate the behaviors or activities of the residents but they can enable them and give them the opportunity to regain a sense of purpose. Design considerations such as shading, weather protection, proximity to points of interest, social engagement opportunities and maintenance are an integral part of the process. Without the forethought of how these features may affect usability and functionality, outdoor spaces will have little chance for success.

## Caregiver Spaces & Engagement

Caregivers are one of the most integral influences on the residents'



quality of life. They are responsible for managing their health, food intake, daily exercise and overall well-being and happiness. In most observation scenarios, caregivers were actively apart of the resident's everyday activities and were frequently seen at the residents' side conversing and interacting with them. Caregivers were often inquisitive, kind, patient and enthusiastic and frequently took opportunities to engage the residents in their surroundings. However, the observational sessions made apparent that no spaces were either solely dedicated for their use nor was any part of the landscape tailored to their role in engagement.

*Takeaway* - Caregivers play a vital role in the quality of life for the individuals they care for yet are often not included into the design thinking of the outdoor spaces. Specific areas and landscape features that tailor to the needs and interests of the caregivers should be implemented in the outdoor space in order to create an environment that maximizes resident engagement.

## *Interviews*

Another form of data collection that was instrumental in the formulation of my design guidelines and inventory of landscape components were interviews with professionals in various fields. The interviews were able to fill in the gaps of knowledge that literature review and observational sessions couldn't satisfy. Interviews were conducted with owners/directors from various memory care facilities as well as with an occupational therapist. Balanced between formal questioning and informal conversation, the interviews enlightened my process regarding the nuances and inner workings of caring for an individual with AD.

### Interview with Brenda Chappell from Revere Court Memory Care

My time spent at Revere Court Memory Care consisted of a conversation with Brenda Chapell, the director of the facility and a tour of their outdoor landscape. Our conversation consisted of a discussion of what the daily behaviors of the residents looked like, what activities and methods the caregivers prescribed to engage the residents and different strengths and weaknesses of their outdoor space in terms of resident interactions.

Perhaps the most valuable takeaway from the conversation was the “importance of instilling a sense of purpose” through activities and tasks (Chappell, 2018). Whether through giving an individual a chore to complete like folding socks or having elementary school children come and practice their reading skills, I learned the value of providing opportunities for the residents to find purpose. Brenda emphasized that when the residents did partake in activities that made them feel valued, their behaviors noticeably shifted and their quality of life seemed to improve.

### Interview with Tony Fischer from Healdsburg Senior Living

The director and garden manager at Healdsburg Senior Living, Tony Fischer, discussed with me the necessity for changes within the senior care system, the status quo for senior living facilities and how they typically approach senior engagement, the strategies he implores to improve quality of life for the residents, the various features exhibited in their outdoor garden and the results of their enhanced level of care. According to Tony, the senior care industry has become “institutionalized” and has evolved to be “run with a business-like mentality” leading to passive and unengaged seniors suffering from AD resulting in degraded qualities of life. These trends in the senior care industry that he was distraught over drove him to create an outdoor space that goes above and beyond typical practices for memory care. The garden that he oversees implements tactile gardens and pathways, pet therapy, physical therapy stations, vermaculture gardens, beehives and spaces for outdoor teaching to accommodate visiting elementary schools.

Despite the fact that much of our interview gave me inspiration and ideas of how to better integrate landscape features in the outdoors, learning about the approach that he defined as “communiversity” was perhaps the greatest takeaway (Fischer, 2018). This approach integrated intergenerational learning via outdoor classrooms. In working with 11 different local school programs, elementary students from various age ranges came to learn, practice skill-sets and interact with the elderly. Considering how divided generations are in

modern society, this provided an excellent opportunity for kids to learn from and converse with individuals they typically wouldn't interact with otherwise. Not only did this improve levels of social interaction among the residents and help to improve quality of life but the students were also major beneficiaries in these interactions in that they were able to practice their reading skills, learn about horticulture and sustainable practices and gain valuable life lessons.

### Interview with Mary Michlovich from OPICA Adult Day Care and Counseling Center

My interview with Mary Michlovich back in December of 2017 was the introduction into my process for this project. Our discussion centered around questions that pertained to the type of activities she has her members engage in, the range of cognitive abilities observed, how families interacted with their loved ones, agitated behaviors and mood swings and capacity for lucidity. The interview was followed up with a small tour of the facility where I was able to witness activities occurring and then we stopped to discuss the outdoor space of the facility. The discussions we had were a vital first step in my approach to understanding what the daily lives were like for the members and how to confront passivity.

The most memorable portion of our conversation was when we discussed when patients would have lapses in their cognitive decline and slip back into reality, if only for a moment. One story she recounted was when she was helping a member get buckled into her seat in a van as she was taking the members on a field trip for the day. This particular elderly lady's condition was severe and showed little signs of cognitive functioning. However, there was a brief moment in this process when she looked at Mary with tears in her eyes and said "I'm so sorry" (Michlovich, 2017). It was in that instant that Mary could see the lady enter a lucid state of mind and had some semblance of cognitive functioning for a few seconds. In that brief encounter Mary believed the lady became self-aware of her own condition, demonstrating that people with AD can feel a range of emotions and can experience life similar to that of regular people and thus should be treated as such.

## Interview with Lisa Bland from St. Catherine's Occupational Therapy Program

In order to ensure that my prescription of activities coincided with occupational therapy principles, I found it necessary to understand what methods and strategies a practicing occupational therapist (OT) may employ in order to stimulate effective engagement. For this reason, I conducted a written interview via email with Lisa Bland, a practitioner who works with St. Catherine's to teach on-line OT practices. The interview consisted of questions that pertained to effective activities for engagement, how to cater to different personalities and cognitive abilities, outcomes, implementing strategies in the outdoors, experiential strategies and personal anecdotes. (For a full record of the interview, see Appendix A.)

The most powerful piece of insight that I gained from this interview derived from a question pertaining to the prescription of activities for the personalities and capabilities of the individual. In describing the process of personalizing the therapeutic process, Lisa claimed, "as Occupational Therapists, we ask, 'What matters to YOU?' Not, 'What's the matter WITH YOU.' Intervention/ activities are specific to the patient/individual, given their diagnosis and then implemented into the care plan"(Bland, 2018). This quote emphasizes the idea that therapeutic intervention isn't about treating the illness, its about treating the individual. Rather than approach this project as if I was trying to treat a symptom or an illness, this insight emphasized the need to create a process that tailored to the emotional and personal needs of the individual.

## Process Model

To compensate for a lack of experience and knowledge in geriatric psychiatry and neurobiology, my design approach relied on existing models and strategies that professionals and researchers in various fields have refined over years of experience and learned knowledge. In order to determine an effective process for which to derive my landscape guidelines and design concepts, I

chose to develop my approach utilizing the Comprehensive Process Model of Engagement, developed by Jiska Cohen-Mansfield, Ph.D. This theoretical framework is concerned with the “mechanisms of interactions between persons with cognitive impairment and environmental stimuli” (Cohen-Mansfield, et al., 2009). The model asserts that an individual’s level of engagement with their surroundings is affected by a combination of environmental attributes, person attributes and stimulus attributes.

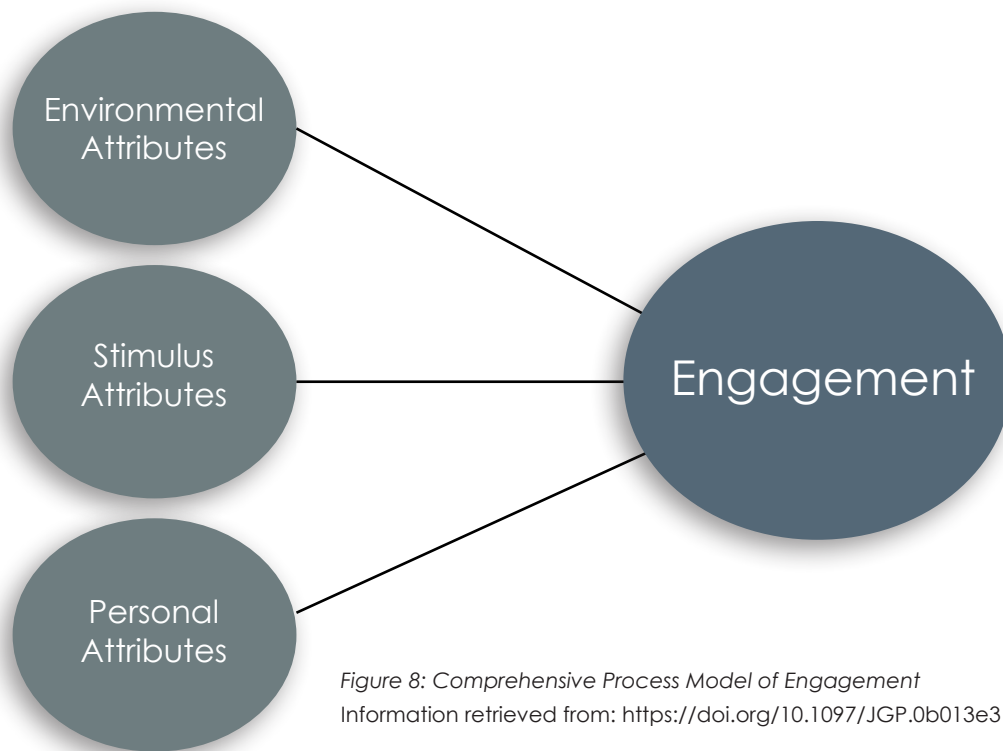


Figure 8: Comprehensive Process Model of Engagement  
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Current standards for memory care landscapes seem to focus their efforts on environmental attributes (the setting and context of a space) and stimulus attributes (qualities of cognitive stimulation and functionality of a space) to a lesser extent. All the while, modern approaches almost completely neglect to address the role of personal attributes (how a space may relate to the individual). Current practices promote a standard of accommodation; rather than a standard of engagement and it is due to this discrepancy that I believe an improved set of guidelines is essential for progress. The approach that I undertook in creating a set the set of landscape guidelines aims to remedy this insufficient standard by ensuring that my guidelines integrate all three facets

simultaneously and with equal importance.

## *Role of Engagement*

Studies have shown that nursing home residents spend a majority of their time not engaged in any meaningful activity, citing that over 60% of the time patients spent their time doing little or nothing at all. (Cohen-Mansfield, 2009; Ice, 2002). Further analysis of the studies revealed that residents manifested a greater number of agitated behaviors when they were unengaged and fewer agitated behaviors when involved in social or structured activities (Cohen-Mansfield, 1992). It is believed that these behaviors occur as a result of the magnification of the apathy, depression, boredom and loneliness that accompanies the progression of dementia (Buettner et al., 1996). Not only was lack of engagement associated with negative behaviors but the inverse scenario also held to be accurate. When older persons with dementia participated in appropriate activities, analyses showed that increased engagement yielded beneficial effects including increased positive emotions, improved activities of daily living (ADL) and improved quality of life (Orsulic-Jeras, et al., 2000).

It is for these reasons and more that the integration of engagement practices within the framework of memory care landscape design is so vital to improve quality of life. The detrimental effects of passivity and the benefits of stimulation and participation in activities serve as the foundation from which my project goal is derived.

## *Environmental Attributes*

Environmental attributes are the degree to which the characteristics of a space will be conducive for resident focus on particular stimuli. This may include characteristics such as the location in which the stimulus is presented, the number of people around, the level of temperature, noise, and light and the manner in which the stimulus was presented. The following environmental attributes are meant to inform the surroundings of which stimuli is integrated into the landscape.

- Frequency/types of seating

- Enclosure and safety of spaces
- Placement and amount of shade cover
- Visibility
- Safety, material type and maintenance of pathways
- Separation of spaces based off functionalities
- Sufficiency of night lighting
- Proximity and density of vegetation

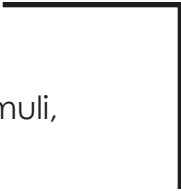
## *Stimulus Attributes*

Stimulus attributes are the characteristics of an object or activity that evoke a specific functional reaction within the brain. In order to effectively implement attributes of various stimuli, I utilized principles of multi-sensory stimulation which has been proven to have positive effects on cognitive state, depression and anxiety in individuals with AD (Ozdemir et al., 2009). The following stimuli attributes are meant to inform the qualities of the stimuli and are contingent upon the personal attributes of the individual for whom the stimulus is meant to engage.

- Traditional methods of perception (visual, auditory, olfactory, taste and tactile)
- Degree of reward (cause and effect)
- Degree of manipulation (whether an object is movable/or can be interacted with)
- Level of activity
- Memory recall
- Cognitive challenging
- Self expression and creativity
- Social engagement

## *Personal Attributes*

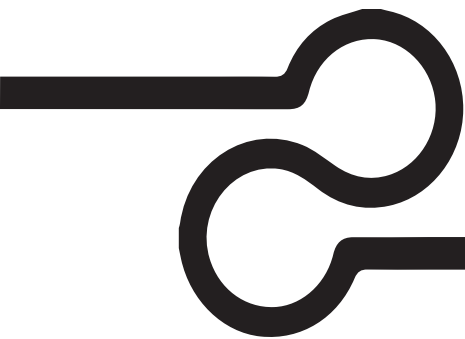
Personal attributes describes the degree to which the characteristics of an object, setting or activity tailors to the pre-morbid interests and identity of the individual. Studies have shown that person-tailored stimuli has the capacity



to increase levels of engagement when compared to standard forms of stimuli, underscoring the necessity for individualized therapy interventions (Cohen-mansfield, 2000). Whether through implementation of features that enable activities that were of interest to the individual before the onset of their disease or through the implementation of icons, scenery or aesthetic style that were significant to the individuals life history, personal attributes provide a connection to self-identity. The following personal attributes are meant to inform how the setting and stimuli can tailor to the self-identity of the individuals who are in need of engagement.

- Cultural/religious significance
- Family role
- Interests
- Hobbies
- Occupation
- Previous memories
- Personality type





# Landscape Guidelines



The fundamental principles that guide the design of the outdoor space for memory care landscapes has been widely covered by various professionals and experts. In my approach, I ensured that the product did not conflict with existing literature on effective memory care landscape design and aimed to integrate what has already been established into the framework of the product. For the purposes of this project, established guidelines for designing memory care landscapes have been omitted as it is not the intent of the final product to produce an exhaustive list of design recommendations for memory care.

As a result of the lack of importance placed on personal attributes in current standards for memory care landscapes, I have decided to frame my landscape guidelines through the lens of the needs and qualities of the individual. My guidelines still utilizes a combination of the three attributes laid out in the process model but rather than utilizing a one-size-fits all approach, I wanted to ensure that my project's products were flexible and tailored toward the individual. The following design guidelines are meant to serve as the tools necessary to create a more personally-tailored, stimuli appropriate landscape, increasing the likelihood that the individual will engage in meaningful activity. These set of guidelines aim to fill in the gaps within the context of designing memory care landscapes by utilizing personal attributes as the framework from which to apply environmental principles and appropriate stimuli.

## *Landscape Guidelines for Background, Interests, and Positive Memories*

Besides tailoring to the personality type of the individual, which is covered in the next section, it is vital to implement attributes that cater to the resident's background, previous interests and positive memories of life history. Although episodic memory (pertaining to times, places, contextual information and their associated emotions) is eroded during the progression of the disease, studies have show that emotional memory may be preserved during the mild and intermediate stages of the progression (Okada & Matsuo, 2012; Guzman

& Vasquez, 2014). This has major implications on therapeutic interventions for engaging individuals with AD in that it provides an additional avenue in which to utilize stimuli that improves cognitive function. The landscape is an excellent opportunity to help enable the individual to engage in past interests, reminisce about fond memories and participate in an activity that grants a sense of purpose. The following guidelines and strategies aim to incorporate these personal attributes within the context of the memory care landscape. (For an example of applicable questions that pertain to these personal attributes, see Appendix B.)

#### General Guidelines:

1. If you are not the caregiver of the individual, it is vital you begin the process of designing the outdoor landscape by establishing an open line communication with the close relatives or loved ones of the individuals you are designing for. A landscape that effectively engages the individual with AD relies on an understanding of the personalities
2. Attempt to understand what drove the individuals with AD and what gave them purpose by gathering an inventory of the individuals' past interests and passions. Utilize this individualistic inventory to guide the decision making and implementation of landscape features and spaces.
3. Query about the era in which individual grew up, the aesthetic style of their childhood and adult home and the general environment in which they lived (rural, urban, suburban etc.). Use this information to dictate the aesthetic style of outdoor spaces by implementing appropriate materials, vegetation types and landscape features.
4. Utilize features that enable the individual to participate in an activity that resembles their previous family role, occupation and hobbies.
5. Many studies have shown that when individuals are given music play-lists of songs and artists that they enjoyed before the onset of the disease, there is a noticeable improvement in behavior and

engagement. Take a music inventory of preferred genres, artists and songs to form a play-list that has the opportunity to be integrated into landscape elements such as outdoor speakers or a stage for dancing.

6. Present opportunities for the individual to reminisce over past memories such as memories pertaining to loved ones,

Design Strategies:

- Implement elements that resemble icons, figures, equipment or any symbol that may be pertinent to the cultural or religious background of the individual. This may include statues of religious figures, a flag of an individual's home country or a piece of fixed farm equipment that reminds the individual of home.
- Implement outdoor speakers along pathways, in intimate spaces or in an outdoor stage to stimulate dancing activities. Work with caregivers to ensure the music being played tailors to the preferred play-lists of the residents.
- Styles of outdoor space evolve with time and location. Design spaces to integrate plant species, color palettes, materials and types of landscape features.
- Integrate opportunities for images, maps or symbols of experiences and memories that evoke positive emotions in the individual to be displayed. This may include pictures of family member, frequent or memorable vacation spots or imagery that resembles their home environment.

## *Landscape Guidelines for Personality Type*

### Role of Personality Type

In order to prescribe landscape recommendations and features that were appropriate to the personality of the individual it would engage, I relied

on an existing approach developed by Ann Kolanowski and Linda Buettner, a registered nurse and certified therapeutic recreation specialist. This method of prescription relies on the taxonomy of personality traits known as the Five-Factor Model (FFM) which personality psychologists have relied on for decades to understand individual differences and to provide a general structure through which we gain knowledge about individuals (Digman, 1990). Although the model consists of five traits (openness to experience, extraversion, neuroticism, agreeableness and conscientiousness), the method only utilizes the traits and facets of that comprise style of interest, openness to experience and extraversion. Studies have shown that AD does alter the personality of the individual but on closer examination, findings support that the traits of openness and extraversion persist after the onset of the disease (Kolanowski & Buettner, 2008). It is for this reason that the method from which my guidelines were derived rely solely on these traits and their accompanying facets. The persistence of traits that pertain to styles of interest is the foundation in which the integration of personal attributes is so vital in the process for creating an engaging landscape.

Openness describes the domain of personality that reflects a need for novelty and a curiosity about the world and are typically intrigued by original, imaginative, broad and daring ideas (McCrae, 1994; McCrae & Costa, 1987). Those who are high in this trait tend to enjoy the unconventional and tend to be unstimulated by the mundane, while those who score low tend to prefer the familiar (Kolanowski & Buettner, 2008). Extraversion describes the domain of personality that reflects the amount of social stimulation preferred by the individual and are typically associated with being active, talkative and being the center of attention (McCrae & Costa, 1987). Those who score high in this trait tend to be individuals who are more outgoing while those who score low tend to be individuals that prefer solitary pursuits (Kolanowski & Buettner, 2008).

These personality traits that comprise style of interest are further broken down into a number of facets that give more specific descriptions of personalities. The following facets used by the prescriptive model for openness are fantasy (imagination), aesthetics (artistic interests), feelings (emotionality) openness to action (adventurousness) and openness to ideas (intellectual curiosity). The following facets used by the prescriptive model for extraversion are

gregariousness, assertiveness, activity level and excitement seeking.

### Method of Prescription

In order to apply this model into the approach of memory care landscape design, each facet was broken down into a need that is dependent on a score that is high or low. For each need, are laid out in order to enable the caregiver or designer to tailor the landscape to the individual. In order to determine the needs of the individual(s), principles adopted from the NEO-Personality Inventory, a standardized assessment tool for determining personality traits used by professional psychologists, were used to devise a survey that would determine the pre-morbid personality of the individual with AD (McCrae & Costa, 2004). This survey is intended to be answered by a close relative or loved one that can accurately respond to statements pertaining to the personality traits of the individual before the onset of their cognitive decline. Each statement is meant to serve as a quantitative measure of whether the individual scores high or low for a particular facet. For example, below is an example of a statement that pertains to the facet of Imagination.

Values novelty and creativity over logic and critical thinking.				
Very Inaccurate	Moderately Inaccurate	Neither accurate nor inaccurate	Moderate Accurate	Very Accurate
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Each response is given a score (“Very Inaccurate” being the lowest score of -2 and “Very Accurate” being the highest score of 2) and then are subsequently added together into an overall score representing the degree to which the individual relates to a particular facet. Total scores above 0 means that the need for that facet is high while scores below 0 means that the need for that facet is low. The further away from 0 the score is, the greater of a weight that particular need has in the implementation of the landscape design. This method of prescription is meant to act as an accurate measure of determining personality traits. Once scores are derived from this survey, the individual will have a greater level of clarity in deciding how to design the landscape to be as effective and engaging as possible. (For an expanded survey for determining residents’ personalities, please see Appendix C).

## Guidelines and Strategies Pertaining to Extraversion

*Gregariousness – describes a person's tendency to find the company of others pleasantly stimulating and rewarding. They are typically individuals who enjoy the excitement of the crowd.*

### **Need: Greater Social Stimulation (High Gregariousness)**

General Guidelines:

1. Design the outdoor environment in such a way that it can facilitate the opportunity for intergenerational engagement through conversation and activity. Whether it is through the visitation from family members, friends, the community, local schools or outreach programs, the landscape and the integrated features should provide mutual benefit across population types.
2. Create spaces where daily activities can be done in a social setting, such as shared mealtimes, group exercise and games as well spaces that promote the sharing of stories, memories and life histories.
3. Even among those with a sociable disposition, apathy is one of the most frequent and early symptoms of dementia, resulting in low levels of initiative and motivation for participation. The landscape should facilitate interactions between the visitors and the residents in such a way that the visiting individual leads, guides or directs the interaction, as this leads to longer periods of engagement (Dinapoli et al., 2013).

Design Strategies:

- Utilize site analysis to get a better understanding of what type of youth programs, community groups and schools are near the site as they can be powerful assets in creating increased levels of engagement and establishing healthy relationships.
- Create landscape elements or features that provide stimulation

and intrigue for various types of individuals in order to facilitate the re-occurrence of visitation and the establishment of healthy and lasting relationships.

- Rather than separate areas based off types of uses, intertwine spaces so that there is greater crossover of function in the landscape. Design spaces to be multi-functional where interaction between residents and visitors is more likely to occur.

### **Need: Strong Desire to Have Time to Oneself (Low Gregariousness)**

General Guidelines:

1. Especially during the mild to moderate stages, individuals can have moments of clarity and become cognizant of their cognitive deterioration. Design contemplative and meditative spaces that enable the individual to escape and manage their emotional state.
2. Social isolation among the elderly is associated with poorer overall cognitive functioning ; integrating social spaces in the memory care landscape is still vital in the case of individuals who prefer to be alone
3. Separate spaces based off their function (social vs. private, active vs passive, etc.) in order to prevent less sociable individuals from feeling alienated from the outdoor environment.

Design Strategies:

- Implement more spaces that are intimate, personal and separate from the main path. Utilize ample softscape (groundcover, shrubs, trees, etc.) to limit visual access to the built environment.
- Implement calming music, nature sounds, animal habitat and natural views to create the opportunity for positive distraction.
- Contain views with either vegetation or fencing in order to limit outside distractions.
- Provide a sufficient balance of refuge spaces and social spaces so that a choice can be made for the individual depending on their



emotional state.

*Assertiveness – describes a person that “likes to take charge and direct the activity of others.” They are typically individuals who are “leaders in groups.”*

### **Need: Take Control of Situation and Lead (High Assertiveness)**

General Guidelines:

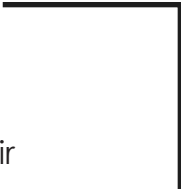
1. Residents commonly suffer from anxiety and frustration as they progressively lose cognitive capabilities , resulting in an overwhelming feeling of lack of control; design elements of the landscape that allow the resident to take charge of an activity or manipulate their surroundings (Ferretti et al., 2001).
2. Provide a set of choices rather than leaving it open-ended. Because judgment centers of the brain are greatly affected as the disease progresses, ensure that the choices to be made are few in number, straight-forward and rewarding.

Design Strategies:

- In order to reestablish a sense of control for the resident, implement landscape features that can be manipulated, moved or altered by the residents.
- Design elements within the landscape that instigate activities or games that are rewarding, challenging and do not allow the individual to fail.
- Be careful to not design landscape elements that enable activities, brain teasers or games that are neither too easy as to demean the residents nor too difficult that it would frustrate the resident.

### **Need: Demure and Prefers to Stay in the Background (Low Assertiveness)**

General Guidelines:

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1. Those who are low in assertiveness will be more inclined to appreciate observation and an environment that dictates their choices. Design the environment to be explicit, well defined and unambiguous.
  2. Implement landscape elements that are highly sensorial and function independently of the user's interaction with the element.
  3. Landscape elements that encourage activities that put the user in the spotlight are unfavorable for those who would prefer to take passive roles in their environment.

Design Strategies:

- Implement framed, variable and intriguing views to provide stimulating opportunities for observation.
- Utilize water features, wildlife habitats such as bird feeds and pollinator plants and fireplaces to create interesting environments that can be observed from a distance.
- Integrate personal characteristics from the residents' past, culture, interests or memories in order to stir up positive emotions.

*Activity Level – describes a person that likes to “lead fast-paced and busy lives. They do things and move about quickly, energetically and vigorously.” They are typically individuals “who are involved in many activities.”*

### **Need: Physical Movement (High Activity Level)**

General Guidelines:

1. Although physical movement is typically impaired in some fashion for most residents, studies have shown that physical activity is one of the most effective strategies in improving cognitive engagement for those suffering from AD (Lindenmuth, Frank & Moose, 1990; ).
2. Ensure that any area involved with physical activity has ample opportunity for seating or rest.

3. Introduce elements that get children or family members involved as the residents may be more inclined to participate.

#### Design Strategies:

- Integrate music, props and games into the landscape elements in order to instigate physical movement.
- Accessible gardening planters, woodworking stations, swimming pools for water aerobics, ample pathways for walking and open areas for yoga or dancing are all safe and effective strategies for engaging residents in physical activity.
- Ensure that outdoor activity areas are well lit in order to cater to those who may feel more active at night and to prolong opportunities for physical activities, especially during short winter days.

### **Need: Leisurely Movement (Low Activity Level)**

#### General Guidelines:

1. Provide areas that allow for landscape elements to be engaging without the involvement of extraneous motor ability (i.e. observation, laying down, walking or activities of daily living(ADL's
2. Integrating practice of ADL's or chores into the function of landscape features is an excellent way to engage non-ambulatory residents (folding clothes, cooking, eating, gardening) and allows them to feel more self-confident and independent.
3. Implementation of landscape features that encourage activity in non-ambulatory residents should be accessible and functional and require little movement for engagement.

#### Design Strategies:

- Provide ample seating and shade while keeping the element in a relatively contained and small area. Deciduous shade trees are an integral part of seating areas as they provide comfortable spaces

in the hot summers and the opportunity to enjoy sunlight during the short winter days.

- Integrating clotheslines and bins for hanging up and folding clothes, dining tables for sharing meals and outdoor cooking areas with ample counter space so that the resident can be involved in the cooking process are effective leisurely activities.
- Installing outdoor heaters is essential if the outdoor space is to be functional during the colder hours of the day.

*Excitement seeking – describes a person that is easily bored or uninterested without high levels of stimulation and engagement.*

### **Need: High Levels of Stimulation (High Excitement Seeking)**

General Guidelines:

1. Cognitive stimulation can improve memory, problem solving, mood, and decrease behavioral disturbances. Exciting music, puzzles and outdoor games can be integrated into the landscape as a form of cognitive therapy (Logsdon et al., 2008).
2. Utilize bright lights, vibrant colors, diverse sounds and varying textural elements in the overall design of the outdoor space in order to provide multisensory experiences.
3. Be cognizant that an individual predisposed to enjoying high levels of stimulation may still find themselves overwhelmed by stimulation; especially for residents in the later stages of progression, be wary to implement features that over-stimulate.

Design Strategies:

- Landscape elements that implement specific memory training, general problem solving, multisensory stimulation, word games and puzzles, social activities, and/or use of external memory aids can be instrumental in cognitive stimulation.
- Create planting palettes that have vibrant, colorful blooms, scented

flowers, textured foliage or produce intriguing sounds during bouts of wind.

- Integrating areas for various animals or pets to be housed in the landscape can be an excellent way for individuals to engage in stimulating interactions with therapeutic effects.

## **Need: Low Levels of Stimulation (Low Excitement Seeking)**

General Guidelines:

1. It is important to recognize that too much stimulation may worsen confusion or cause agitation; too little may lead to withdrawal. With individuals predisposed to dislike 'hustle and bustle', err on the side of caution when implementing multisensory landscape elements.
2. Simple, consistent and tranquil spaces are essential for those who may get be predisposed to getting confused or disoriented easily.
3. Avoid utilizing lights, sounds or visuals that may cause distress or a feeling of being overwhelmed.

Design Strategies:

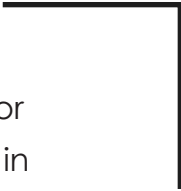
- Simple water features to produce soothing ambient noise, minimal use of multisensory planting and may do better to engage those who adversely react to elevated levels of stimulation.
- See section: 'Need: Leisurely Movement' for applicable design strategies.

## Guidelines and Strategies Pertaining to Openness

*Imagination – describes a person that “views the real world as too plain and ordinary. They use fantasy not as an escape but as a way of creating for themselves a richer and more interesting inner-world.”*

## **Need: Interesting Inner World and Fantasy (High Imagination)**

General Guidelines:

- 
1. Grounding the individual in reality isn't always the best option for engagement; sometimes it is preferable to let the resident exist in their own world, separate from reality. Create fantastical themes that provide the opportunity for the individual to engage in their inner world.
  2. Create landscapes centered around particular themes, whether through colors, sounds, textures, resident interests or cultures. The more cohesive an area, the more immersive and engaging the space becomes.
  3. Create spaces that enable activities that are not associated with daily activities, chores or tasks; encourage the resident to enter a different world, even if for a moment.

#### Design Strategies:

- Contain visual intrusions from the built environment through the strategic formation of berms or vegetation.
- Utilize paving, walls, fences, water feature designs, colors, materials and details to reinforce character or a particular theme.
- Utilize tree canopies to manage views, create pleasant visuals and provide shaded areas for comfort.
- Implement wind chimes, outdoor speakers that play relaxation music or natural sounds and water features to create a natural and calming environment.

### **Need: Task-Oriented & Grounded in Reality (Low Imagination)**

#### General Guidelines:

1. Those with who score low in the imagination facet tend to be individuals who derive satisfaction out of facts and traditional environments. Utilize consistent aesthetic themes, highly visible areas and traditional materials in order to orient the individual in reality.
2. While those who are creative tend to focus their energies and attention inward while being separate and unique from others,

those who are more grounded in reality are more likely to inherit contrasting qualities. Give them something to focus on in the external world that is tangible and direct.

3. Provide links and opportunities for information access to the outside world.

Design Strategies:

- Utilize easily maintained hardscape and vegetation materials as to uphold a consistent aesthetic of cleanliness and order.
- Implement informational/daily task boards to enable caregivers to employ written cues, as they can be instrumental in providing daily structure and help reduce problem behaviors.
- Integrate newspapers and magazine stands, clocks and/or calendars into the landscape elements to ground the residents in reality and to provide orientation of time and place.

*Artistic Interests – describes a person that “loves beauty, both in art and in nature. They become easily involved and absorbed in artistic and natural events.”*

### **Need: Appreciative of Art and Beauty (High Artistic Interests)**

General Guidelines:

1. Design opportunities for individuals to engage in personal interests, hobbies and self-expression.
2. Aesthetic preferences can be reserved in the face of cognitive decline; aim to understand what the preferences are of the patient(s) and integrate them within the landscape elements (Halpern & O’connor, 2013).
3. Implement themes and tones of natural elements into the landscape to make the residents feel they are more connected to nature.

Design Strategies:

- Integrate art pieces and features like that connect to the residents' culture, religious orientation or background like a mailbox, cultural or religious icon, or small piece of farm equipment.
- Utilize naturalistic materials, ample vegetation for cover and screening and water features to create an overall natural tone.

## **Need: Unconcerned with Art and Beauty (Low Artistic Needs)**

### General Guidelines

1. In order to establish avenues for the landscape to tailor to those who show no predisposition to art or beauty appreciation, provide opportunities for the individual to engage in their environment in a way that is direct, goal-oriented and simplistic in nature.
2. Implement landscape features that present challenges that are repeatable, straightforward and are not challenging to the point that they are agitating or frustrating to the resident.
3. The landscape elements should tailor in the individuals' past interests, hobbies or occupation in order to hold their attention for extended periods of time.

### Design Strategies:

- Design features that require the resident to engage in goal-oriented tasks such as organization, fixing or cleaning that provide a sense of accomplishment and reward.
- For features that require a task to be completed, accompany the elements with a set of clear instructions and a clear objective.
- Features such as workbenches, sheds or clotheslines can be utilized to drive tasks and engage those who are not art-inclined.

*Emotionality – describes a person that “has good access to and awareness of their own feelings.” Typically, individuals high in emotionality have a larger depth of emotions.*



## **Need: Emotionally Aware (High Emotionality)**

### General Guidelines:

1. An individual's capacity to verbally communicate their emotional state deteriorates with the progressions of the diseases, Design an outlet for the individual to express their emotions in a non-verbal, constructive way.
2. Individuals can experience prolonged states of emotion that persist well beyond the patient's memory for the events that originally caused the emotion. Tailor landscape elements to re-activate positive, stored emotional memory.
3. Design the outdoor environment to block out distracting and unnecessary stimuli, especially noise, in order to provide better opportunities for resident interaction and communication.

### Design Strategies:

- Provide opportunities for maps, photos or imagery of previous positive experiences to be displayed in order to stimulate recall centers of the brain.
- Utilize tree canopies and vegetative screening to block out external visual and auditory distractions.
- Implement features that provide the opportunity to utilize colors, sounds or textures to express a feeling or emotion (e.g. Feeling Cube).

## **Need: Dispassionate (Low Emotionality)**

### General Guidelines:

1. Creating outlets for emotional expression for those who are not inclined to do so may do little to engage the individual. Those that are not inclined to express or communicate their feelings may feel more comfortable in an environment that facilitates hands-on or cognitively challenging activities, similar to those who are low in imagination or assertiveness.

2. Provide opportunities for positive distraction rather than an outlet to communicate feelings. Not all individuals feel the necessity to communicate or dwell on their emotional state.

Design Strategies:

- See section 'Need: Down-to-Earth' & 'Need: Demure and Stay in Background'

*Intellectual Curiosity – describes a person that is “intellectually curious and tend to think in symbols and abstractions.” Individuals that rate high in intellect are relatively open to new ideas.*

### **Need: Appreciates Exploration and Philosophy (High Intellectual Curiosity)**

General Guidelines:

1. Creating diverse and unique landscape elements is a great way to engage patients who seek to satisfy their curiosity and intrigue. Patients who score high in this area tend to engage in environments that allow for discovery, new views or sensations and provide a sense of mystery.
2. Design areas that obfuscate views, have multiple paths, have differing thematic characteristics and allow the resident to discover things on their own. However, it is important to design elements that do not disorient or make the resident feel as they are in a foreign environment.

Design Strategies:

- Integrate pathways that implement side paths to smaller spaces.
- Utilize taller vegetation, berms or retaining walls around corners as to provide a level of uncertainty and mystery around corners.
- Create the opportunity for the individual to exercise their curiosity

and explore the space by tucking spaces away from sight.

- Scavenger hunts are a common practice to get AD residents engaged; provide exciting, beautiful or colorful objects to be found in hidden spaces.

## **Need: No Appreciation for Exploration (Low Intellectual Curiosity)**

General Guidelines:

1. Create highly visible, navigable spaces that utilize way-finding in order to allow the resident to easily circumnavigate the space.
2. Aim to make the landscape a singular, cohesive space rather than mixture of diverse, unique spaces as to make the landscape's function clear and easily understood.
3. Keep options and choices minimal in the landscape in order to prevent the individual from becoming overwhelmed or disoriented.

Design Strategies:

- Integrate pathways that are unidirectional and refrain from designing side pathways that branch off from the main path.
- Utilize sign posts or land markers to orient the individual in the landscape, giving them constant affirmation of their location and intended destination.
- Utilize a higher concentration of groundcover and low shrub as to create higher visibility than would ample tree canopy and tall shrubs.

*Adventurousness – describes a person that is “eager to try new activities and experience different things.” They are typically individuals that “find familiarity and routine boring.”*

## **Need: Adventurous and Appreciates Variety**

### General Guidelines:

1. Due to the impairment of memory centers as well as cognitive capacities, incorporating landscape elements that are highly variable and unique may provide longer periods of engagement amongst the residents.
2. Provide a wide range of scenery, framed views, choices and activities in the landscape but be aware that AD is associated with disorientation and confusion; make sure to not overwhelm or over-stimulate the individual as to exacerbate cognitive issues.

### Design Strategies:

- Utilize a variety of plant species with diverse color palettes, textures, bloom periods and scents.
- Integrate an ample amount of spaces that differ in functionality and provide a wide array of activities or stimuli. Spaces for dancing, physical activity or outdoor games where the activity can be flexible and altered on a frequent basis as to not stagnate.

## **Need: Consistent and Appreciates Familiarity**

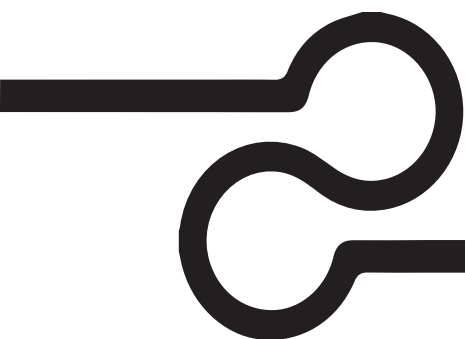
### General Guidelines:

1. Those that are more inclined to be dependent on routine or a normalized schedule, may find a disruption in that regular system to be upsetting, traumatic or confusing due to the brains deterioration of judgment centers. Those that express a need for familiarity would benefit greatly from landscape elements that do not vary in their look or functionality.
2. Create spaces that have a consistent aesthetic as to be easily recognized and feel familiar to the individual regardless of the time of year, weather condition or time of day.



Design Strategies:

- Allocate spaces in the landscape that refrain from using deciduous vegetation as to keep a consistent look and aesthetic.
- Design spaces that make the individual feel at home or are reflective of an environment in which the individual had fond memories of.
- See section “Need: No Need for Exploration (Low Intellectual Curiosity) for additional strategies.



# Design Concepts

## The Facets and Associated Preferences of Openness and Extraversion

### Adventurousness



### Gregariousness



### Assertiveness



### Activity Level



### Excitement Seeking



### Imagination



### Artistic Interests



### Emotionality



### Intellectual Curiosity



In order to bring to form the landscape guidelines I have just described, I have created an inventory of conceptual designs by which I have represented through various illustrations and an application of the personality model. Each concept will have a combination of plans, sections or perspective drawings, a list of needs that are satisfied (indicated by one of the icons below) and a brief description as to how the concept aims to engage residents in the outdoor space. These concepts not only function as the beginning of a conceptual catalog for AD specific spaces but they are also an effective demonstration of how to tailor a design to the needs and qualities of the individual. The design decisions utilizing a personality lens are subtle in their implementation but the design concepts help exemplify how those choices may occur. Figure 9 depicts the breakdown of the personality facets and the associated needs of that individual. For each design concept, a list of satisfied needs will be presented on the page and accompanied by four of the graphic symbols above. The needs that each concept satisfies are not mutually exclusive with other needs but demonstrate in what manner the design concept tailors to an individuals character.

Figure 9: The Facets and Associated Preferences of Openness and Extraversion

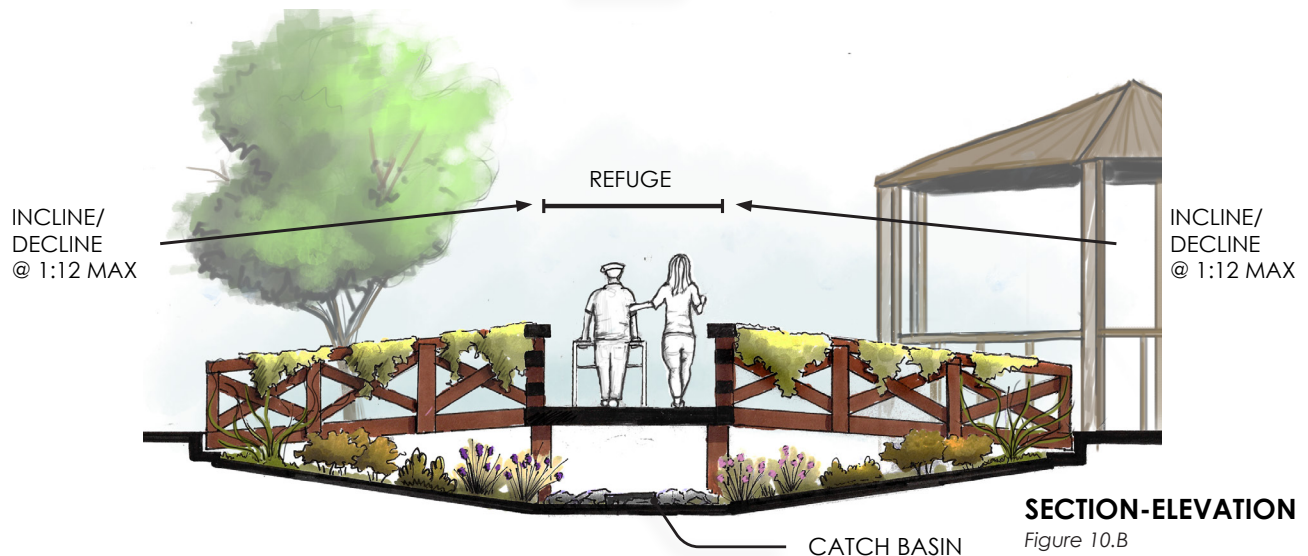
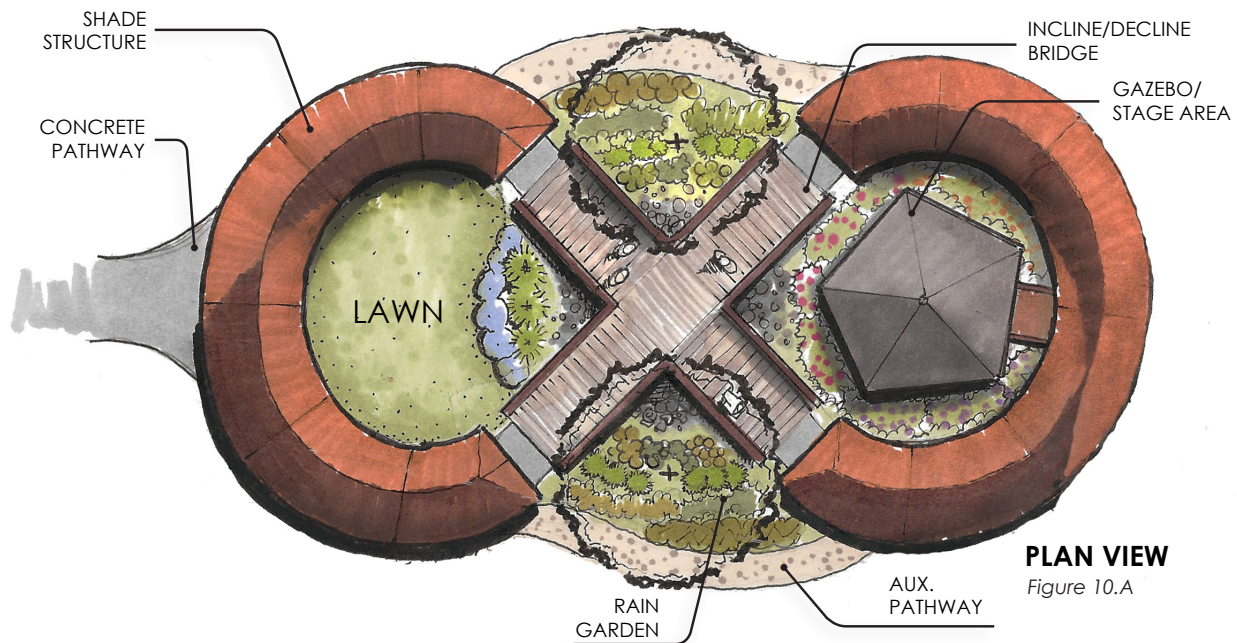


Figure 10: Conceptual Design #1 - 'The Activ-eight'



The shade-protected, concrete pathway and gazebo/stage area function to provide ample opportunity for the individual to engage in more lively, energetic activities. This satisfies the needs for individuals who live a more active lifestyle.



The lawn area and auxiliary pathways that circumnavigate the bridge allow individuals who are more inclined to partake in more leisurely, slow paced activities to engage their space in a way that suits their needs.



The diversity in areas allows for the individual to decide how they want to activate the space, granting them a sense of control and enabling them to make the space their own. This coincides with individuals who are dependent on control.

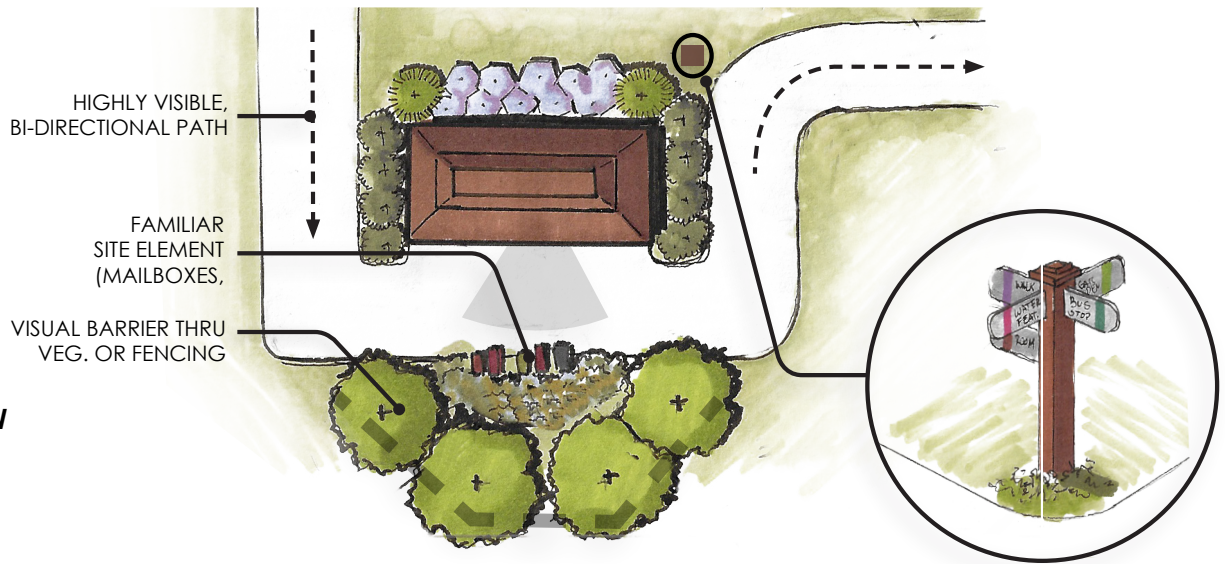


The figure eight form of the design concept reflects the need to satisfy the repetitive behaviors demonstrated by individuals with AD in a healthy manner. The consistent and symmetrical pathway provides clarity and familiarity for the individual.

## The Activ-eight

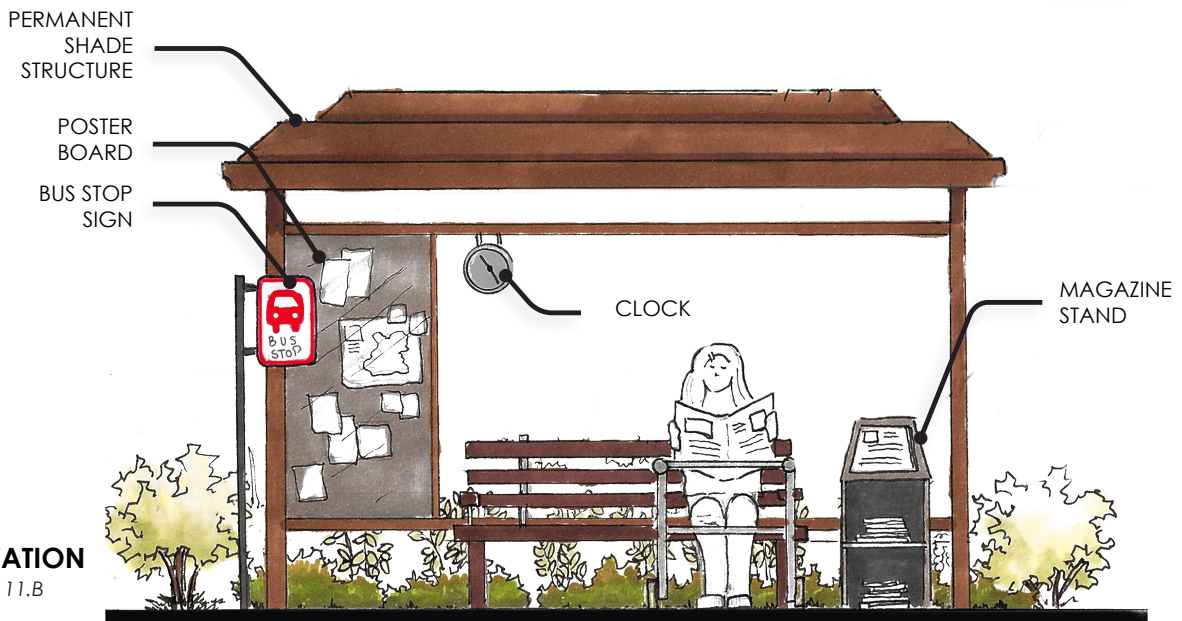
This concept design aims to engage users through physical activity, whether slow-paced or energetic, through a variety of spaces which are all connected through a concrete pathway and central bridge. The minimal incline/decline of the bridge allows for increased levels of physical activity while the shade structure allows the individual to utilize the space for extended periods. The open lawn space allows the caregiver to have some liberty in creating activities or exercises that may be helpful in stimulating engagement.





**PLAN VIEW**

Figure 11.A



**ELEVATION**

Figure 11.B

Figure 11: Conceptual Design #2 - 'The Bus Stop'

# The Bus Stop

The bus stop employs strategies that allow the individual to engage in a familiar activity. Especially amongst the 'baby boomer' generation, the aesthetic of a bus station resonates with many individuals and can be utilized as a behavioral management practice. Individuals can reminisce over posted photos, imagery or maps or sit and read the newspaper to stay grounded in current events. All of this done in the familiar atmosphere of a bus station.

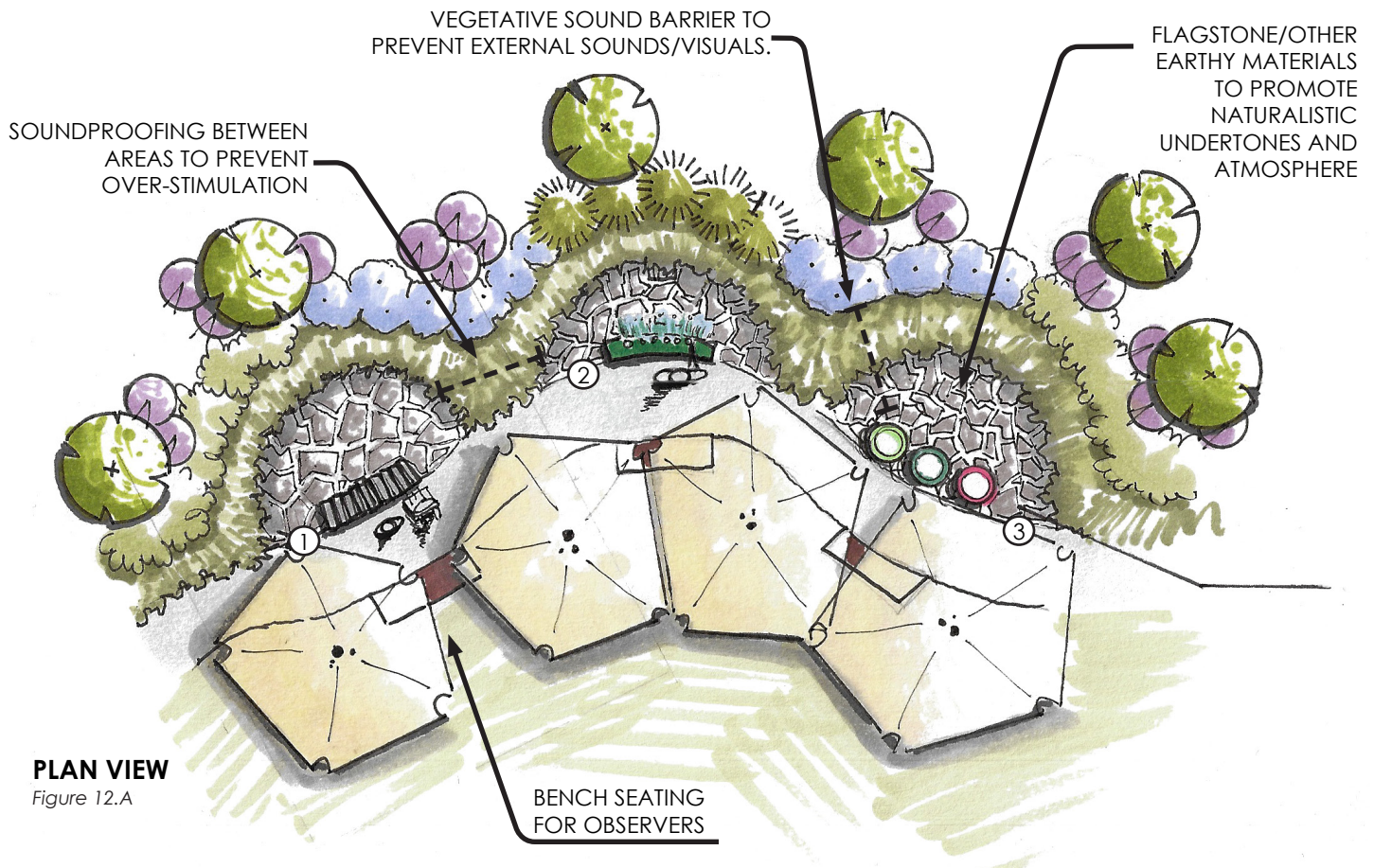
A clock and newspaper stand allow the individual to stay grounded in reality and may prove useful to individuals in the mild stages of progression where they may exercise their cognitive capabilities through current events.

The simple aesthetics with a simple functionality allow this conceptual design to tailor to individuals who may not have the capacity to express emotional states. It provides a place to simply sit and observe.

Together with sign posts, way-finding features and a bi-directional pathway, this conceptual design enables the individual with low intellectual curiosity as this space is constant and leaves nothing to mystery.

With a poster board to provide opportunities to add personality to the space and a viewing element in direct view of the seat, the concept aims to instill a sense of belonging and familiarity for an individual.

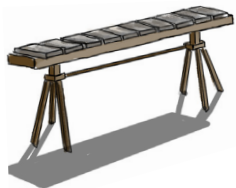




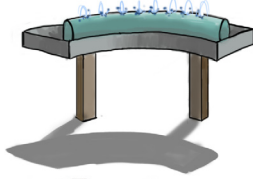
**PLAN VIEW**

Figure 12.A

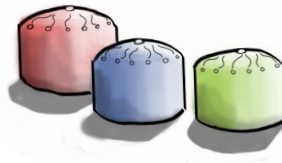
① STONE LITHOPHONE



② HYDROPHONE



③ WHALE DRUMS



THESE FOLLOWING INSTRUMENTS ARE CHARACTERIZED BY SOFT, RESONATE SOUNDS AND HAVE BEEN IMPLEMENTED INTO VARIOUS HEALTHCARE SETTINGS. OTHER TYPES OF INTERACTIVE AUDITORY FEATURES THAT PRODUCE SIMILAR SOUNDS MAY ALSO BE INTEGRATED IN THIS SPACE TO CREATE SAME EFFECT.

Figure 12: Conceptual Design #3 - 'The Auditory Path'



The excitement associated with producing music may be very rewarding for individuals who are predisposed to novel and thrilling experiences.



Music has the capacity to resonate with people who made have had a preference before their onset of AD. This concept would be especially effective for individuals who had a background in music.



The ability for the individual to control the stimulus being presented in their surroundings enables them to exert a need for assertiveness.



The ability for the individual to control the stimulus being presented in their surroundings enables them to exert a need for assertiveness.

## The Auditory Path

The auditory path is a concept derived to function as a space that is as beautiful as the sounds it produces. With instruments filling the air, the space provides an opportunity for individuals to not only reconnect with musical backgrounds but also to provide the opportunity for individuals to use their hands and create. The ability to create should not be understated as it reinstills a sense of purpose within the individual. These instruments are fail-proof and are unlikely to produce harsh or high pitched sounds.

**SENSORY PATHWAY W/ VARIOUS TEXTURES:**

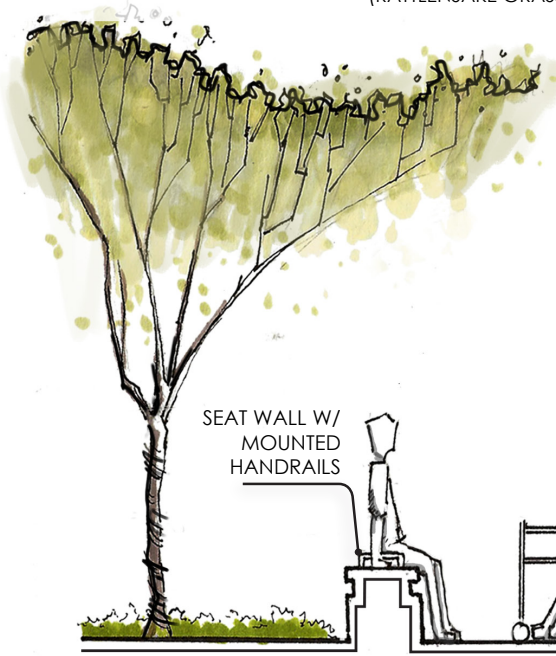
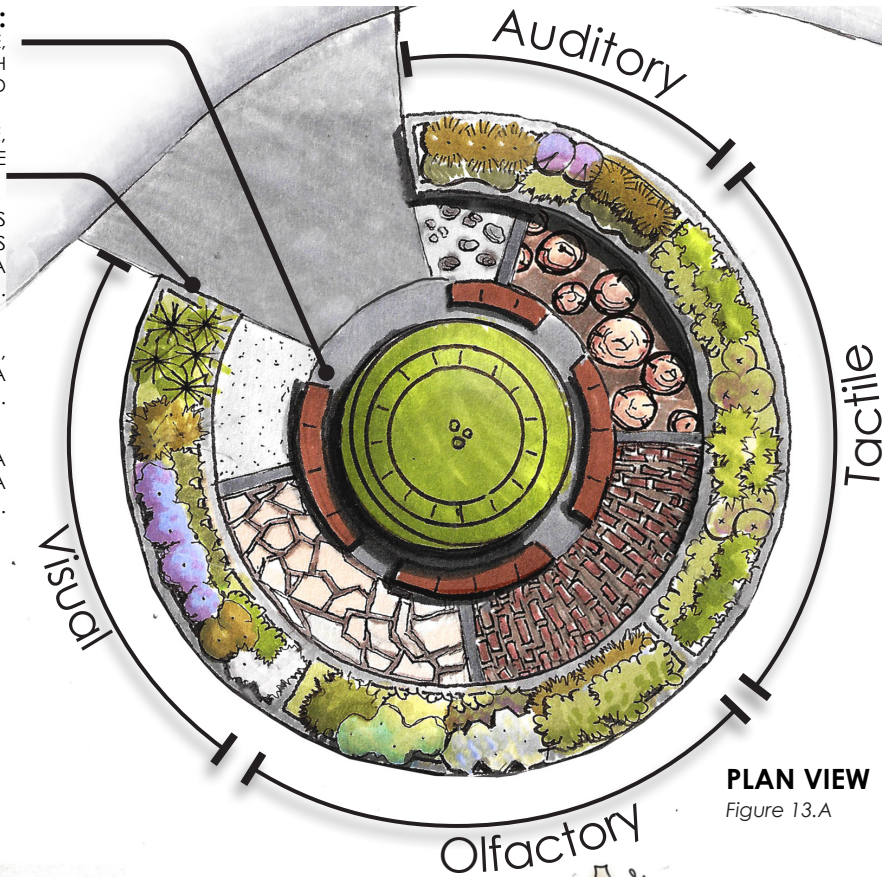
CONCRETE WITH EXPOSED AGGREGATE FINISH, FLAGSTONE, BRICK PAVERS, WOOD CROSS SECTIONS AND CONCRETE WITH EXPOSED

**VISUAL SPECIES:** SPECIES WITH SEASONAL VARIANCE, COLORFUL BLOOMS AND INTRIGUING FOLIAGE

**OLFACTORY SPECIES:** SALVIA OFFICIANLIS (COMMON SAGE), ROSMARINUS OFFICIANLIS (ROSEMARY), THYMUS VULGARIS (THYME), LAVANDULA ANGUSTIFOLIA (LAVENDER).

**TACTILE SPECIES:** STACHYS BYZANTINA (LAMB'S EAR), STIPA TENUISSIMA (MEXICAN FEATHER GRASS), ARTEMISIA SPP., GERANIUM SPP.

**AUDITORY SPECIES:** BAPTISIA SPP., BRIZA MEDIA (QUAKING GRASS), SASA SPP., BRIZA MAXIMA (RATTLESAKE GRASS).



**SECTION**  
Figure 13.B

Figure 13: Conceptual Design #4 - 'The Sensory Ring'

# The Sensory Ring

This concept design aims to engage users in a way that activates multi-sensory stimulus through natural elements. The varied senses that the vegetation activates are meant to instill a tangible sense of wonder and create an immediate response to interaction. The orientation of the seatwalls are aimed to stimulate social interaction and more intimate conversation. The area is enclosed and secluded in order to instill a sense of tranquility and seclusion.

The rings of seat wall provide the opportunity for individuals to interact within an intimate setting. The proximity of the seating encourages eye contact and conversation, making this space an opportunity for social interaction.



The prevalence of multi-sensory plant species allows this space to satisfy the needs of one who may find satisfaction out of the wonder and beauty of nature, surrounding the individual with vegetation and immersing them in nature.



The variety of senses that the space stimulates engages the individual who expresses a need in novelty and change. Whether time of year or weather conditions, the space has the opportunity to provide a new experience with each visit.



A diversion from the main pathway, the enclosed, secluded space with natural undertones creates an atmosphere of tranquility and provides the opportunity for individuals who want to seek a calming and soothing environment.



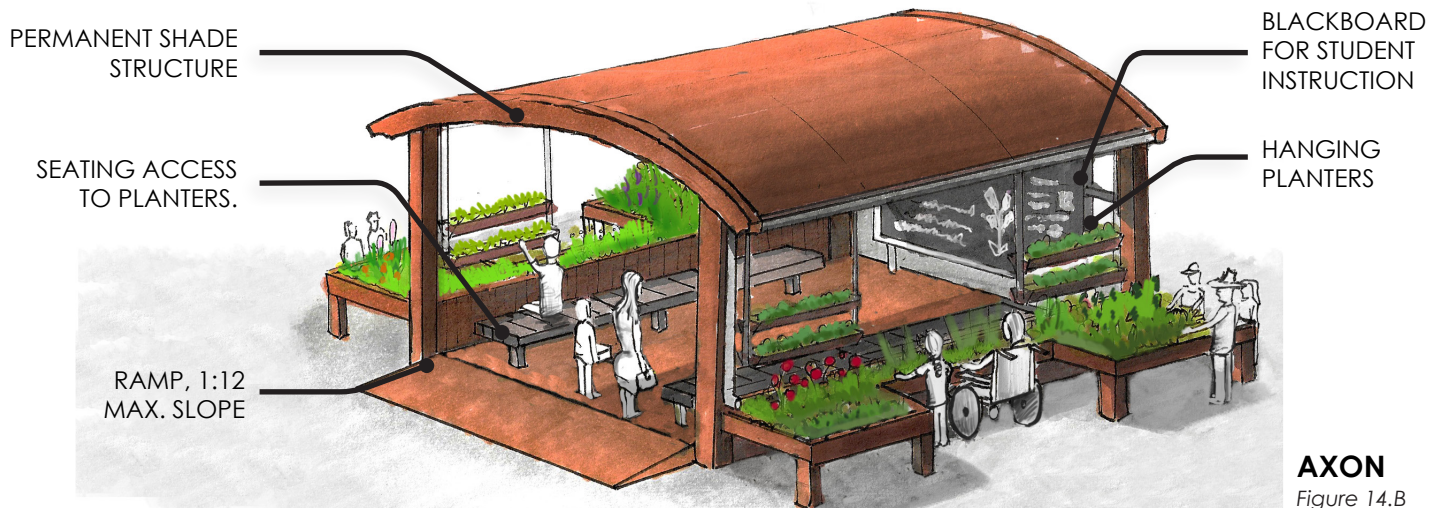
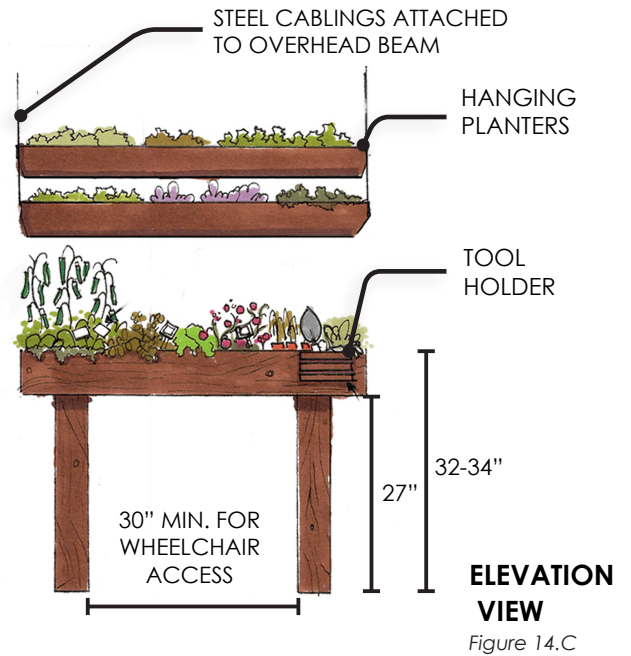
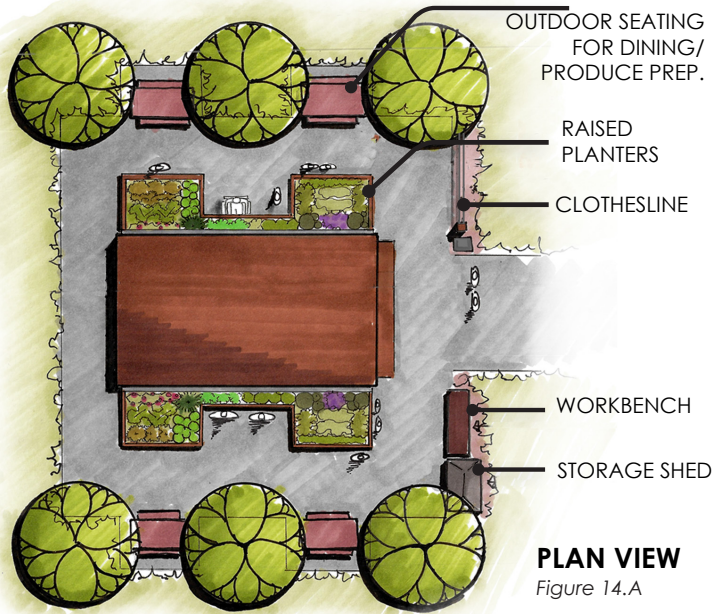


Figure 14: Conceptual Design #5 - 'The Outdoor Classroom'



The workbench, clothesline, organizational shed and the garden planters all provide opportunities for individuals who have a disposition for setting themselves towards an objective and receive satisfaction out of their completion.



The features described above as well as the concept's overall ability to facilitate the integration of intergenerational engagement provides an excellent opportunity for individuals who enjoy company to engage in social interaction.



Especially for individuals who would find satisfaction from manipulating their environment, the planters and task-oriented features enable the individual to better control their environment.



The hustle and bustle of visitation from kids can create a lively and exciting environment and will be especially beneficial for individuals who seek out the company of others.

## The Outdoor Classroom

Utilizing principles from intergenerational interaction, this space is meant to engage elderly individuals with youth communities to promote social engagement and task-oriented opportunities. In order to facilitate an integration of inter-generational engagement into a memory care facility, it is vital to create infrastructure that can encourage participation and alternative learning practices for school programs. The concept integrates stations for gardening, life-skills and conversation in order to create a lively outdoor environment. In the case of at home care, the standalone edible garden planter in Figure 14.C would be sufficient for a similar effect.

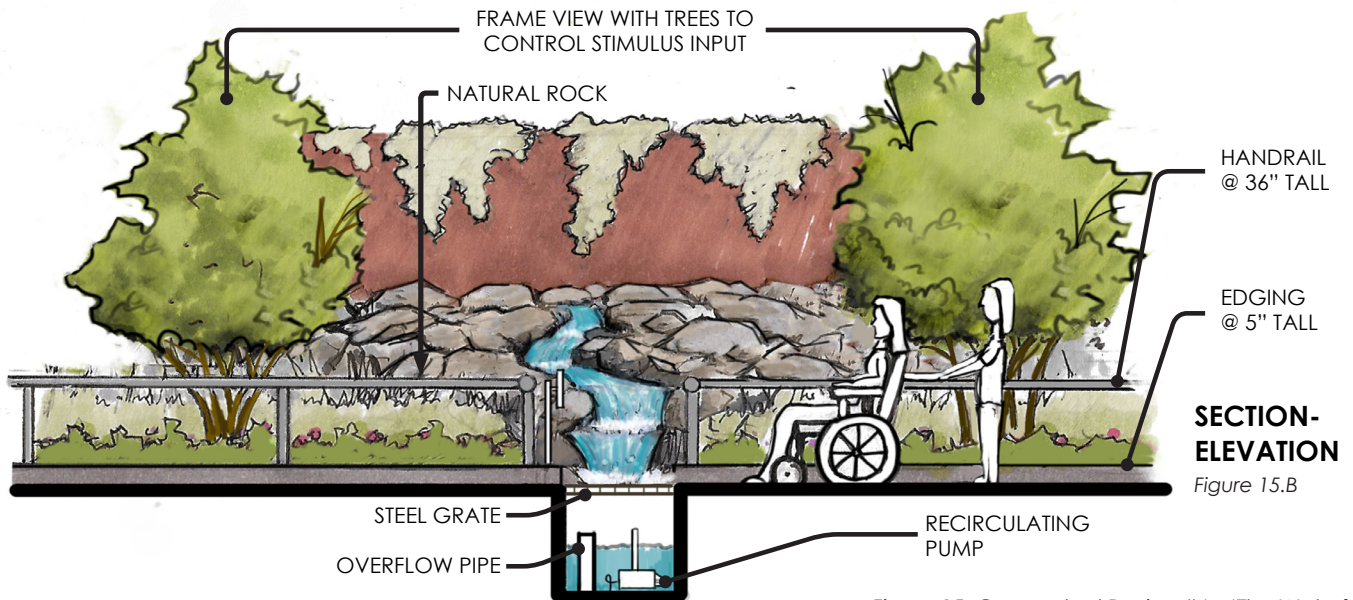
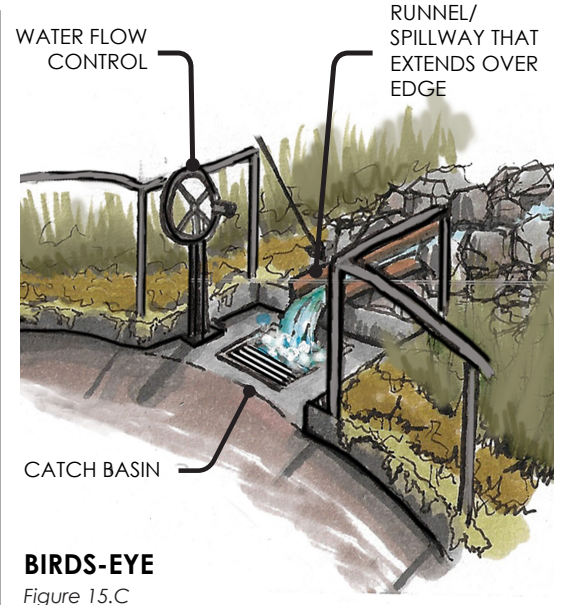
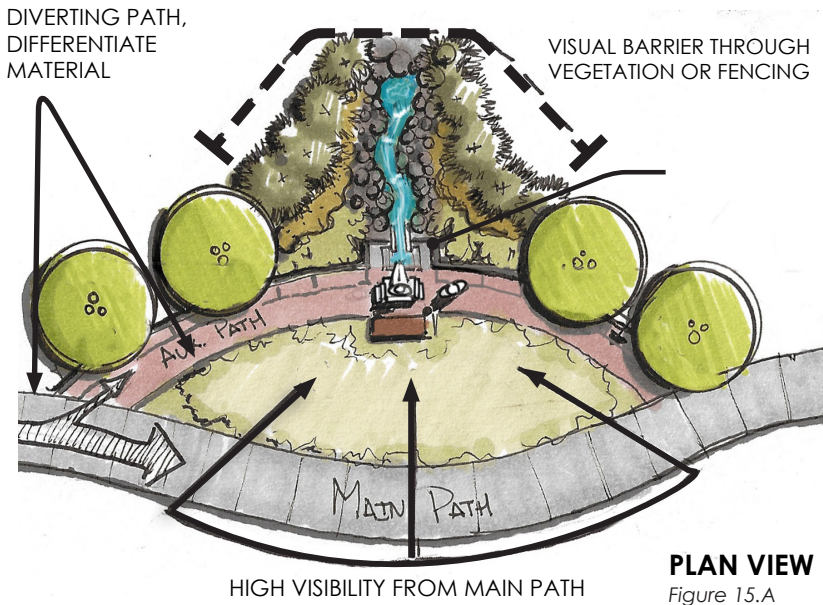


Figure 15: Conceptual Design #6 - 'The Waterfall'

## The Waterfall

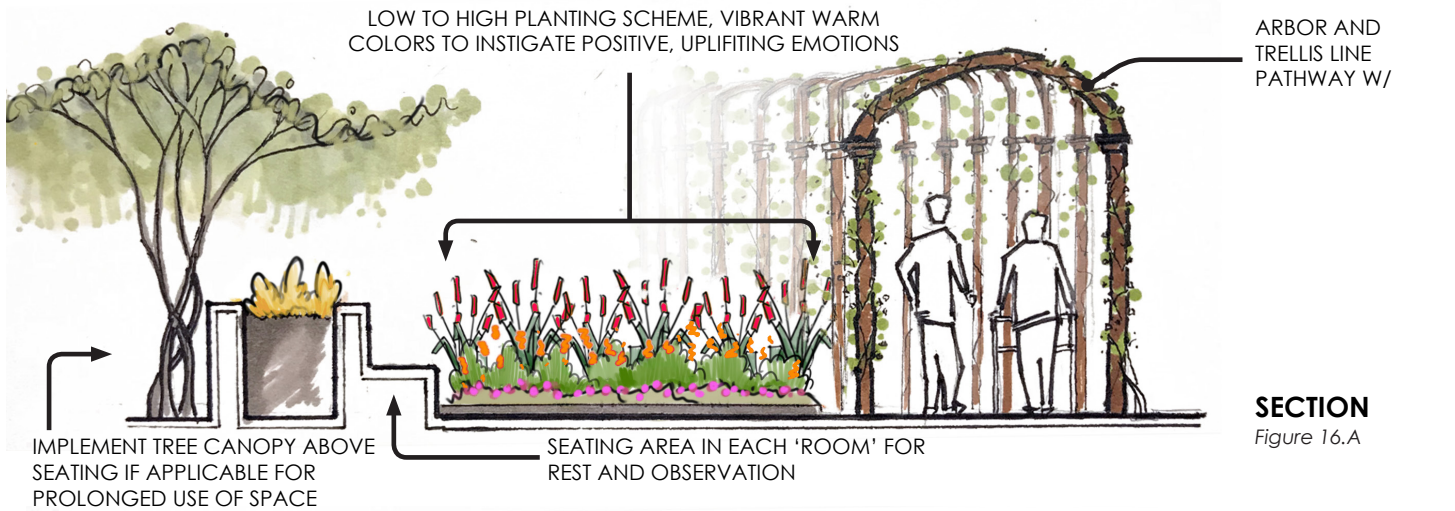
This interactive water feature provides the individual the opportunity to control their environment under the context of a tranquil and serene setting. The water feature features a spillway where the water flow can reach the feet or hands of the user, granting them a tactile sensory experience. The water flow control allows the user to manipulate the rate at which the water feature operates, granting the user control over their environment. The natural tones of the materials provide an environment where the user can feel as though they are immersed into a naturalistic and earthy setting, serving individuals who are more inclined to appreciate natural beauty.

The diverting path and privacy of the feature makes this concept an excellent way to engage individuals who are more inclined to find private, more intimate spaces.

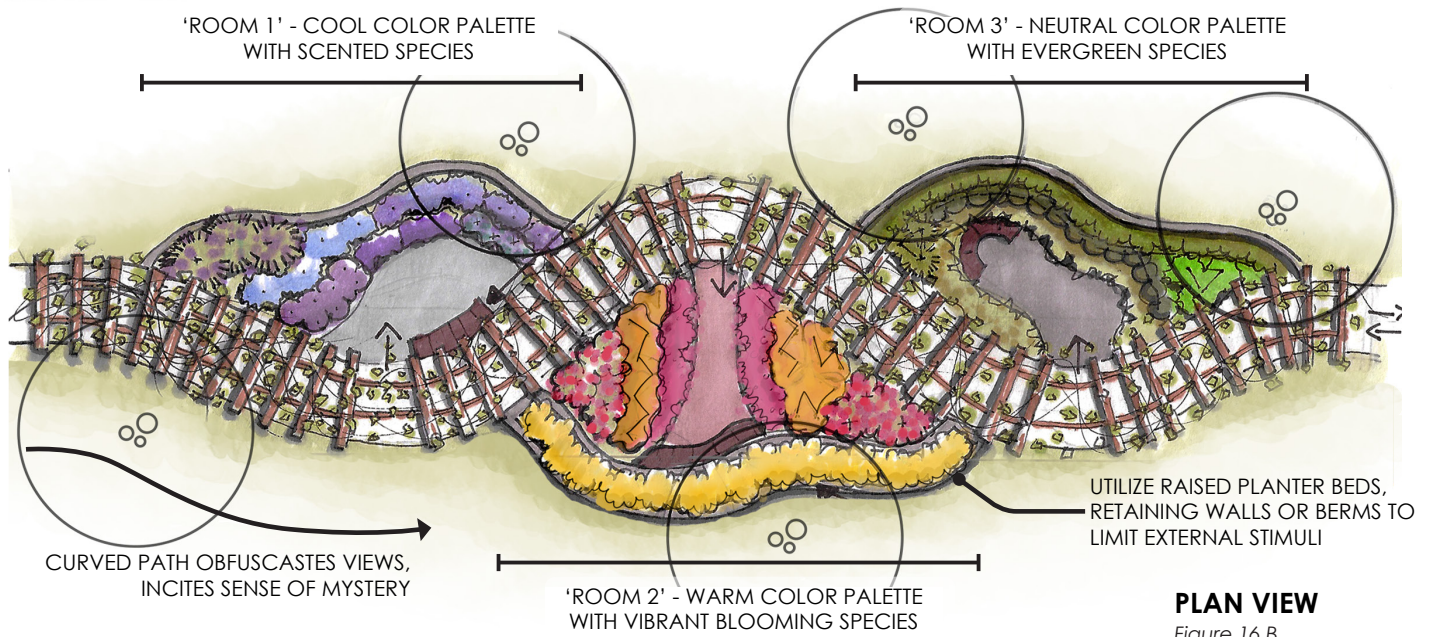
The naturalistic themes and framed view of the water feature aim to create a setting in which an individual who appreciates natural beauty can engage in their surroundings.

The ability for the individual to interact directly with the feature through a water flow control and a scupper that allows the user to feel the water as it falls into the catch basin grants the user a sense of control over their environment.

A diversion from the main pathway, the enclosed, secluded space with natural undertones creates an atmosphere of tranquility and provides the opportunity for individuals who want to seek a calming and soothing environment.



**SECTION**  
Figure 16.A



**PLAN VIEW**  
Figure 16.B

Figure 16: Conceptual Design #7 - 'The Color Rooms'



The curvature of the path and the obfuscation of views implemented by the trellis and arbor system immerses the individual in an imaginative environment. The various themes of the outdoor rooms also aid in creating a fantastical space.



The outdoor 'rooms' give the individual the opportunity to be immersed into a personal and theme driven space. The seating area under shade provides a space where the user can enjoy quiet experience.



Whether the outdoor rooms have a color-centered theme or any other theme that incites positive emotions or memories, the intent of these spaces are intended to allow caregivers to mitigate negative emotional behaviors.



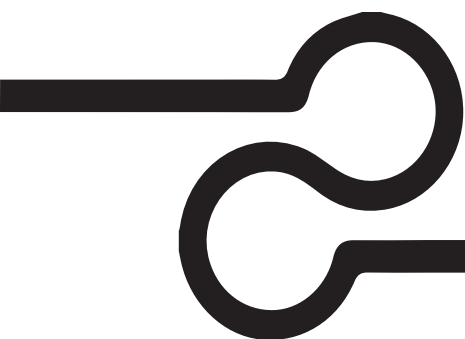
The character of the space allows the individual to explore and discover areas that are not immediately seen. This sense of mystery gives the individual the opportunity for exploration.

## The Color Rooms

This concept adopts principles of Japanese landscape design in that its entry points inhibit the view of the space as a whole in order to create the feeling of discovery and wonder. The winding pathway and trellis-arbor system provides this obfuscation of views and creates a natural-like shade structure for the individual to comfortably navigate. The outdoor 'rooms' are centered around a particular theme such as particular color palettes and are aimed to instigate particular emotions within the individual. This space may be instrumental in individuals who demonstrate erratic mood swings, allowing the space to guide the individual to a more stable emotional state. A warm color palette may help individuals in a depressive state while a cool color palette may help individuals in a

# Conclusion

Through the research and design process of the past few months, what I have come to understand is that what is truly important in the field of memory care landscapes is not what the elements of the landscape are but how those elements are derived. That is not to say, however, that the content of those elements are unimportant but rather that the process in which an individual undertakes to choose those elements is the better predictor of a space's effectiveness. Existing design guidelines go into some depth of what characteristics and features make a memory care landscape effective yet seem to assume that the strategies they describes are appropriate for all types of individuals. Alzheimer's disease and other dementia related diseases are incredibly personal and intimate diseases. They affect people in unique and subtle ways, making one-size-fits-all approaches ineffective and inadequate for engaging its users. In order to create a landscape that serves to properly improve the quality of life of the afflicted individual, the process for designing the outdoor space must include a person-tailored approach that integrates personal, environmental and stimuli attributes that coincide with the identity of the individual it engages. An understanding of the disease and its manifestations, an open line of communication with family members and loved ones (if one is a designer rather than a caregiver) and a thoughtful implementation of multisensory elements that have the capacity to relate to the individual are all necessary facets of creating an engaging landscape. I know that my project will not fix the tragedies associated with Alzheimer's disease but considering its current and future rise of prevalence, there is a large portion of the population whose voices have gone silent at the hands of cognitive decline and are in need of aid. Not only do caregivers not have the support and knowledge needed to truly care for individuals suffering from Alzheimer's disease but senior care centers around the nation are plagued by ineffective and unengaging facilities. The standards for memory care living and this project is my first major step for change in what I hope to be a life-long pursuit.



## Appendices & References



# Appendix A

## **Interview with Lisa Bland - Occupational Therapist**

What is your general process for engaging individuals who are facing cognitive decline? I.e, are there any shared characteristics in your approach of implementing occupational therapies?

*First, a physician must write an order for Occupational Therapy, ie: "Eval and treat." From that, an initial OT evaluation is completed, (including diagnostic specific assessments), and a specific OT treatment plan is initiated and reviewed with the patient, team and or family/care givers.*

Do you utilize a one-size fits all approach or do you try to prescribe activities that tailor to the individuals personalities/capabilities? If so, how do you determine what may or may not work for an individual and their particular personality/capabilities?

*We do NOT use a one-size fits all approach! There are baseline protocols, specific to baseline diagnoses, and, assessments specific to diagnosis, that yield a baseline of function. Also, as Occupational Therapists, we ask, "What matters to YOU?" Not, "What's the matter WITH YOU." Intervention/activities are specific to the patient/individual, given their diagnosis and then implemented into the care plan ie: (treatment activities).*

Are there any strategies/practices that are more effective than others?

*There are many! For any of the reduced/compromised brain function diagnoses, a reduction in environmental sensory input, (think all 5 senses), is typically very effective. Are there any commonly used strategies that are actually ineffective in your experience? Yes, too much sensory input in a given time frame.*

What would you say are the outcomes of applying occupation therapies, positive and negative?

*Positive!*

Do you work with caregivers directly and if so how do you empower them or give them a tool set to better interact with the individuals they look after?

*Yes! Education is power! Education to staff, family members, caregivers customized to the individual/patient.*


Do you work to engage individuals in the outdoors? If so, do you have any recommended or effective strategies to increase access to nature?

*Again, this is specific to the patient/individual. Part of an OT initial evaluation includes determining what is MEANINGFUL AND PURPOSEFUL to the patient. This guides OT's to incorporate appropriate strategies into the treatment plan to facilitate increased participation, enjoyment, function and accomplishment of care plan goals. If the patient enjoys and is accepting of out door activities, then absolutely we engage patients in outdoor activities, again, specific to their diagnosis, level of function and safety.*

Do you have any experimental strategies or new methods you are attempting to implement or would like to implement in the future? Occupational Therapy are the creative masters of unique interventions!

*Again, as per information above, we implement treatment and strategies specific to the patient/individual.*

Lastly, do you have any powerful or emotional memories that came as a result of occupation therapy sessions? If not, maybe a memorable interaction or conversation with the individuals you work with?



*I've been a licensed OT for 20 years and my positive, powerful and emotional memories are endless! I've met, and had the opportunity to treat brave, amazing people who never "give in" to their situation; from retired military personnel, to gang members, retired physicians, stay at home moms, and individuals from every walk of life and just about every injury, trauma or diagnosis! I continually learn from my patients!*

# Appendix B

## **General Personal Attribute Questionnaire**

The following questions are to provide an example of how one may inquire the loved ones of the individuals for whom a professional is designing for:

*Where did your family member/loved one grow up (city/state/country) and in what kind of environment (urban, suburban, rural etc.)?*

*Are there any particular childhood memories they may have mentioned or spoke of often? (Specific place, family tradition, holiday etc.)*

*What hobbies or interests has she/he undertaken recently or in the past? (For example: gardening, woodworking, painting or drawing, etc.)*

*Are there any particular scents that may incite positive or negative emotions as a result of an association with past memories, experiences or feelings? Does she/he have any favorite scents? (For example: the scent of eucalyptus may resonate with a patient due to eucalyptus trees being planted in their childhood home.)*

*Were there any favorite places that your loved one frequented or was of significant importance? (For example: a local hiking trail, a park, a favorite vacation spot, a weekend getaway, etc.)*

*During the progression of their disease, has there been any particular strategies or activities that resulted in a de-escalation of agitated states (i.e. things that make them calm or relaxed)? In the same vein, is there anything that causes your loved one to become agitated or causes negative behavior to escalate?*

*What kind of music did your love one listen to while growing up or in their adulthood? Did they have any favorite songs or artists?*

*Does your loved one have any favorite plants, trees or flowers or a particular type of scenery (beach, mountains, city, etc.)?*

*Does she/he have a cultural or religious background that was significant in their upbringing or adulthood?*

*Did she/he have any household pets growing up? If so, what kind? If she/he has had negative experience with having pets or interacting with animals, please note here (include allergies).*

## Appendix C.

The following survey for prescription was primarily adopted from the NEO-Personality Inventory survey that consists of 240 items. This version isn't all encompassing but utilizes similar questions and concepts to develop a consensus of a personality type. For a standardized and comprehensive exam, refer to Psychological Assessment Resources INC, NEO PI-R.

1. Has a vivid imagination.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
2. Known to day dream or let his/her mind wander.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
3. More oriented towards facts rather than fantasy.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
4. Finds the real world too plain and ordinary.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
5. Values logic and critical thinking over creativity.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
6. Has a great appreciation for beauty, both in art and nature.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
7. Enjoys reading poetry, visiting museums and things similar in nature.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
8. Has a lack of aesthetic sensitivity.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
9. Good access to and awareness of feelings.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
10. Emotional and sensitive.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
11. Withholds thoughts and feelings rather than openly discusses.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>

25. Finds the company of other stimulating and interesting.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
26. Enjoys privacy and time to themselves.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
27. Outgoing and sociable.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
28. Tends to speak out or be confrontational.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
29. Prefers to have control of a situation.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
30. Tends to be the leader in a group.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
31. Assertive and straight-forward.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
32. Lives a fast-paced and busy life.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
33. Move about energetically or quickly.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
34. Involved in many activities.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
35. Follows a slower and more leisurely, relaxed pace.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
36. Loves hustle and bustle.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
37. Enjoys taking risks and thrill seeking.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>

12. Has a stoic and calm demeanor.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
13. Able to handle stressful situations without overreacting.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
14. Eager to try new activities.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
15. Enjoys seeing new and exotic places.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
16. Enjoys novel and different experiences.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
17. Finds familiarity and routine boring.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
18. Appreciates thrill and excitement.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
19. Open-minded to new ideas.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
20. Committed to beliefs and values.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
21. Enjoys riddles, problem solving and puzzles.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
22. Appreciates philosophical and intellectual debate.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
23. Prefers dealing with people or things rather than ideas.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
24. Enjoys being in large groups or parties.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>

38. Overwhelmed by noise or commotion.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
39. Known to make impulsive decisions for the sake of excitement.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>
40. Easily bored without high levels of stimulation.	Very Inaccurate <input type="checkbox"/>	Moderately Inaccurate <input type="checkbox"/>	Neither Accurate nor Inaccurate <input type="checkbox"/>	Moderately Accurate <input type="checkbox"/>	Very Accurate <input type="checkbox"/>



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