

Reinvigorating Landscapes

Using Natural Environments to Enhance Quality of Life in Assisted Living Facilities

Reinvigorating Landscapes

Using Natural Environments to Enhance Quality of Life In Assisted Living Facilities

by

Andrew Holzum

A REPORT

submitted in partial fulfillment of the requirements for the degree:

MASTER OF LANDSCAPE ARCHITECTURE

Department of Landscape Architecture/Regional & Community Planning
College of Architecture, Planning and Design

Kansas State University
Manhattan, Kansas

2016

Approved by:

Major Professor
Dr. Hyung Jin Kim

**Reinvigorating Landscapes:
Using Natural Environments to Enhance Quality of Life In Assisted Living Facilities**

A report submitted in partial fulfillment of the requirements for the degree of:
Master of Landscape Architecture (MLA)

Major Professor:

Hyung Jin Kim, Ph.D. | Assistant Professor
Department of Landscape Architecture Regional and Community Planning

Supervisory Committee:

Susanne Siepl-Coates | Professor
The College of Architecture, Planning & Design | Department of Architecture

Gayle Doll, Ph.D.
Associate Professor
Director, K-State Center for Aging | Department of Human Ecology

Department of Landscape Architecture & Regional and Community Planning
College of Architecture, Planning and Design
Kansas State University

© 2016 Andrew Holzum. Kansas State University, Manhattan, KS.
All Rights Reserved



Abstract

The senior population within the United States has increased by 1.5% from 2010-2014, whereas other demographics have either stayed the same or have decreased (US Census Bureau, 2014). Assisted living facilities focus on sustaining and enhancing the quality of life for the residents, and their physical and social environments should be modified to stimulate this focus. Studies have shown that it can be accomplished by increasing access to nature. Additionally, a diminished physical activity level among senior citizens is an additional research problem as it contributes to their quality of life.

With these research problems in mind, the two research questions being addressed are: How does access to nature affect physical activity levels of senior citizens living within assisted living facilities; and how can indoor and outdoor landscapes assist in promoting physical activity?

To answer the research questions, the following aims were established in support of the research and design objectives of this study: (1) identify barriers limiting use, and (2) identify how access to nature affects physical activity levels in senior citizens within assisted living facilities, (3) to improve access to nature, (4) to improve quality of outdoor spaces, and (5) to encourage outdoor activity.

Research Methods include (a) focus group interviews and (b) an environmental audit to investigate user's preferences of activities, existing access to nature, and barriers prohibiting the use of the natural environments,

(c) literature analysis and research to identify relevant design strategies that have been used in similar studies, and in the design phase, this study synthesizes how design principals can be utilized to solve the identified issues. The findings were then used to create a matrix for design and to also develop design goals and solutions for Homestead. The result of this study identifies strategies used to overcome barriers limiting outdoor use. The focus group and staff interviews along with the environmental audit and the literature analysis findings were used for developing a framework for design.

The design framework and research methods this study used could be applied at similar facilities based on the ability ranges of the residents to produce a design solution that encourages outdoor use and physical activity, and thus, enhance the quality of life of the residents in the assisted living facilities.

Note:

This document is intended to be viewed as a 2-page spread layout and printed double sided. To view as a 2-page spread layout in Adobe Acrobat, please select the following options:

Go to the **View** tab; select **Page Display**; and select **Two Page View**

Table of Contents

<i>List of Tables and Figures</i>	VII
<i>Acknowledgments</i>	XI
<i>Chapter 1 Introduction</i>	I
Driving Forces and Dilemmas	
Research Questions	
Relevance to Landscape Architecture	
Motivations	
Project Intent	
 <i>Chapter 2 Literature Review</i>	 8
Gerontology & Assisted Living Facilities	
Accessibility	
Use of Nature as Medical Intervention	
 <i>Chapter 3 Methodology</i>	 14
Study Setting	
Study Aims and Hypotheses	
Methodology Phases	
 <i>Chapter 4 Findings & Analysis</i>	 24
Background	
Staff Interview	
Environmental Audit	
Case Study Analysis	
 <i>Chapter 5 Design Solutions</i>	 52
Linking Research to Design	
Matrix of Spaces	
Recommendations for Case I	
 <i>Chapter 6 Conclusion</i>	 80
Findings and Results	
Discussion and Limitations	
Future research and Application	
 <i>Bibliography</i>	 84
<i>Appendices</i>	90

List of Tables

Table 3.1 Typologies	18
Table 4.1 Adapted Typologies	44
Table 4.2 Common Chronic Illness Findings	50
Table 5.1 Health Outcomes and Recommendations	62

List of Figures

Figure 1.1 Study Structure	2
Figure 1.2 Goals and Objectives	6
Figure 2.1 Literature Map	10
Figure 3.1 Methodology Diagram	16
Figure 3.2 Typologies	20
Figure 3.3 Goals & Objectives to Focus Group Questions	22
Figure 4.1 Shaded Area	27
Figure 4.2 Trip Hazards	27
Figure 4.3 Garden Space	28
Figure 4.4 Building Uses	29
Figure 4.5 Encouragement	30
Figure 4.6 Overall Audit Tool	31
Figure 4.7 Space Location	32
Figure 4.8 Courtyard Audit Results	32
Figure 4.9 Courtyard Bird Feeder	33
Figure 4.10 Low Site Wall	33
Figure 4.11 Courtyard Lighting	33

Figure 4.12 Space 2 Location 34

Figure 4.13 Creek Space Audit Results 34

Figure 4.14 Exit to Creek 35

Figure 4.15 Northern View 35

Figure 4.16 Southern View 35

Figure 4.17 Space 3 Location 36

Figure 4.18 Exterior Path Audit Results 36

Figure 4.19 View Towards Parking 37

Figure 4.20 View Along Kimball Ave. 37

Figure 4.21 Front View 37

Figure 4.22 Space 4 Location 38

Figure 4.23 Front Porch Audit Results 38

Figure 4.24 Front Bird Bath 39

Figure 4.25 Front Porch 39

Figure 4.26 Entry Approach 39

Figure 4.27 Landscape Area 39

Figure 4.28 Space 5 Location 49

Figure 4.29 South Site Audit Tool 49

Figure 4.30 Retaining Wall 41

Figure 4.31 South Parking Lot View 41

Figure 4.32 Literature Analysis Breakdown 42

Figure 4.33 Facility Design Structure 43

Figure 4.34 Existing Typologies 46

Figure 5.1 Questions Linked to Objectives 55

Figure 5.2 Health Behavior Goals 58

Figure 5.3 Existing Typologies 59

Figure 5.4 Spaces for Focus Group Users 60

Figure 5.5 Key Concept 61

Figure 5.6 Priority Spaces 61

Figure 5.7 Design Plan 64

Figure 5.8 Key Concept 2 66

Figure 5.9 User Profiles 68

Figure 5.10 Design Guidelines 70

Figure 5.11 Materiality (A-F) 72

Figure 5.12 Section A-A: Courtyard 72

Figure 5.13 Courtyard Blow-up Plan 73

Figure 5.14 Perspective Through Courtyard 74

Figure 5.15 Section A-A: Nature Walk 76

Figure 5.16 Nature Walk Blow-up Plan 77

Figure 5.17 View Through Nature Walk 78

Figure 5.18 Section A-A: Entry Sequence 80

Figure 5.19 Front Porch Blow-up Plan 81

Figure 5.20 South Landscape Grounds 82

Figure 5.21 North Landscape Grounds 83

Acknowledgments

This study would not have been possible without the participation of Homestead Assisted Living Facility residents and staff. This study was done under the guidance of Professors Hyung Jin Kim (Department of Landscape Architecture and Regional and Community Planning), Gayle Doll (Department of Human Ecology) and Susanne Siepl-Coates (College of Architecture, Planning, and Design). Thank you all for your time and assistance in bringing this project together.

Dedication

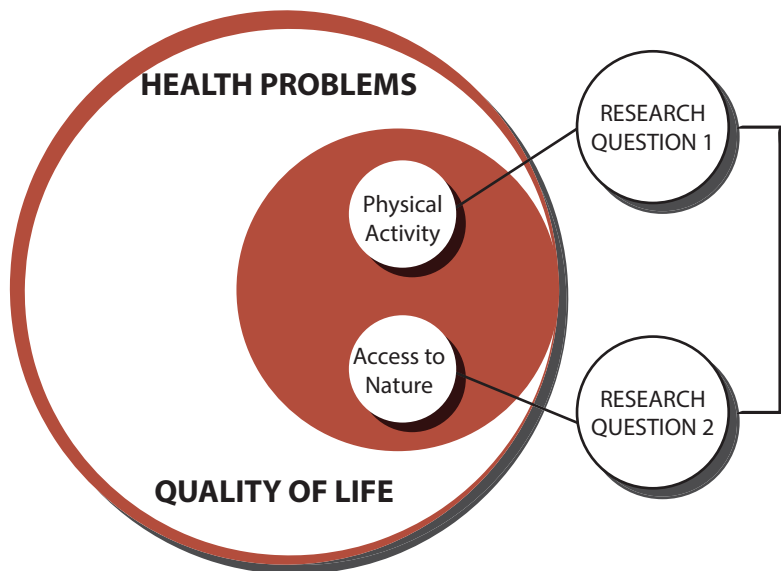
Thank you to my mom, dad, and sisters for your continued support and encouragement. It is because of your work ethic, and motivating example that I am where I am today.

Thank you to my editor, without whom, my big ideas would be lost in translation.

Thank you to my support system, including friends, family, and everyone else who has helped me along the way.

I. Introduction

RESEARCH PROBLEM



RESEARCH

RESEARCH AIMS & HYPOTHESES

IDENTIFY BARRIERS LIMIT USE
HYPOTHESES 1.1 - 1.3

ACCESS TO NATURE EFFECT ON PA
HYPOTHESES 2.1 - 2.3

Chapter I

Figure 1.1 | Study Structure (by author)

There are four phases of this study; (1) identifying the research problem, (2) the research phase, (3) the methodology phase, and (4) the design solution phase.

STUDY STRUCTURE

There are four sections to this study; identifying the research problem, the research phase, the methodology, and finally, the solution. The research problem begins by looking at current health issues and identifying the research questions. The research phase then takes these questions into consideration, identifying aims and hypotheses that will be used to answer these questions. The methodology puts the hypotheses to test in the forms of (1) a focus group interview, (2) an environmental audit, and (3) literature analysis. From these findings, design goals are created which then influence the design solution.

DESIGN GOALS AND OBJECTIVES

IMPROVE ACCESS

ACCESS FROM GATHERING SPACE
DISSOLVE EXISTING BARRIERS
EASILY NAVIGABLE

IMPROVE Q. OF OUTDOOR SPACES

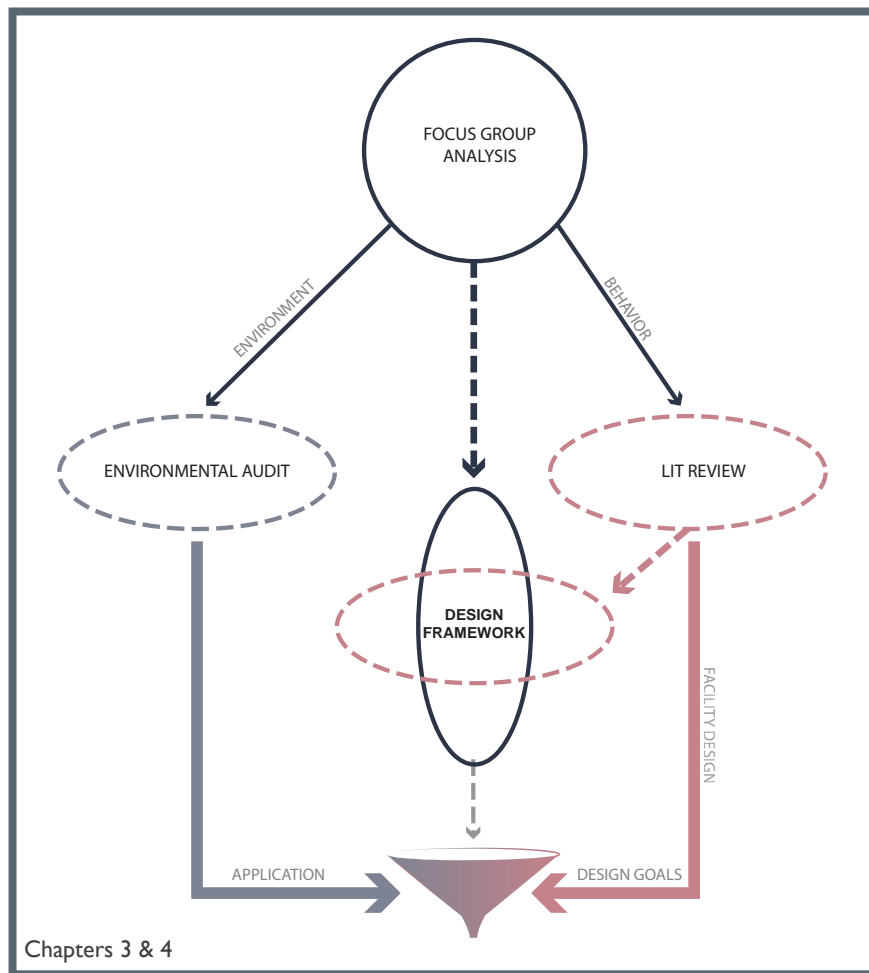
PROVIDE A VARIETY OF SPACES
DIFFERENT GREEN MATERIAL

ENCOURAGE OUTDOOR ACTIVITY

PROVIDE ACTIVE OUTDOOR SPACE
PROVIDE VISUAL ACCESS TO SPACE

Chapters 4 & 5

METHODOLOGY



SOLUTION

Driving Forces and Dilemmas

Population Trend

The senior population within the United States has been steadily increasing annually at a more rapid pace than most other demographics (US Census Bureau, 2014). Though this may be true, the senior citizen demographic has been overlooked by most planners and designers, who focus more on children and younger families (Kauffman, 1961). Additionally, many senior citizens suffer from a diminished quality of life, especially those who are living in assisted living facilities. Many residents living within these facilities are frail, senior citizens who suffer from a variety of chronic illnesses, who might also be suffering from ailments associated with inactivity, discomfort from aging, and other physical health issues such as diabetes. Most of these citizens' time is spent indoors, so their contact with nature is limited (Kane, 2007; Center for Disease Control, 2013).

Quality of Life

There have been different studies (Galson, 2009; Mitchell and Kemp, 2000; Rodiek, 2006; Ulrich, 1984) which have looked towards promoting activity and bettering senior citizens' quality of life within assisted living facilities, but design has not been fully utilized as one of these methods. A concept that has been gaining traction when designing for senior citizens is the idea of the outdoor environment as a form of therapeutic intervention. Results from other studies (Rodiek, 2013) have showed that residents consider access to green space high in value, but spend relatively little time in them. Two issues that prevent residents from using these spaces are physical limitations and design issues related to the spaces. Studies have also shown that having visual access to physical activity features (such as walking paths) has increased physical activity levels in assisted living facilities (Joseph et al., 2005; Detweiler et al., 2012; Rodiek and Schwarz, 2006).

Environments

Many times, senior citizens' exposure to outdoor and natural environments diminish or even cease all together as they make the transition away from their homes. Moving from independent living to assisted living means moving away from preferred outdoor spaces such as patios, gardens, and trails where seniors may have felt more comfortable walking on because navigation was easy. With changes in setting, seniors may not be as comfortable to use outdoor spaces or trails, especially if they are difficult to navigate. The dilemma that assisted living facilities face is in creating an environment that promotes and facilitates senior citizens' activity levels within a natural environment.

Research Questions

how does access to nature affect physical activity levels of senior citizens living within assisted living facilities?

How can indoor and outdoor landscapes assist in promoting physical activity?

Study Goals and Objectives

There are two goals of this study; (1) Investigate and identify the barriers, both physical and visual, that are prohibiting the use of the natural environment for the residents in assisted living facilities; and (2) To investigate the associations between physical and visual accessibility to green open space and physical activity among the residents in the assisted living facilities. Below is a list of aims and objectives associated to each.

GOAL 1:

To investigate and identify the barriers, both physical and visual, that are prohibiting the use of the natural environment for the residents in assisted living facilities. These barriers may also be a perception held by resident about the natural environment.

Objective 1.1:

Identify if the lack of information, spatial readability and familiarity of the existing green open spaces limits the uses of the residents.

Objective 1.2:

Identify whether the lack of physical activity resources acts as a barrier that limits different uses by the residents.

Objective 1.3:

Identify which undesirable elements or if the absence of desired elements makes it difficult for residents to use outdoor spaces.

GOAL 2:

To investigate the associations between physical and visual accessibility to green open space and physical activity among the residents in the assisted living facilities.

Objective 2.1:

Identify whether senior citizens who have better visibility to green open space are more willing to engage in physical activity than those who have worse visibility.

Objective 2.2:

Identify whether senior citizens who have better accessibility to green open space are more likely to engage in physical activity.

Objective 2.3:

Identify how much senior citizen value green space accessibility regarding their health outcomes including physical activity.

A diagram showing how the research aims and objectives relate to the research question can be seen in figure 1.2 on the next page.

Goals & Objectives

Research Questions

Goal 1: Barriers Limiting Use

Objective 1.1

Identify if the lack of information, spatial readability and familiarity of the existing green open spaces limits the uses of the residents.

Objective 1.2

Identify whether the lack of physical activity resources acts as a barrier that limits different uses by the residents.

Objective 1.3

Identify which undesirable elements or if the absence of desired elements makes it difficult for residents to use outdoor spaces.

Goal 2: Access to Nature's Effect on Physical Activity

Objective 2.1

Identify whether senior citizens who have better visibility to green open space are more willing to engage in physical activity than those who have worse visibility.

Objective 2.2

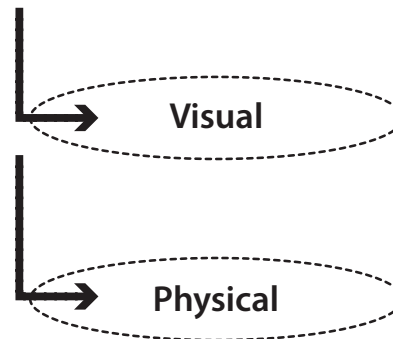
Identify whether senior citizens who have better accessibility to green open space are more likely to engage in physical activity.

Objective 2.3

Identify how much senior citizen value green space accessibility regarding their health outcomes including physical activity.

Research Question 1

How does access to nature affect physical activity levels of senior citizens living within assisted living facilities?



Research Question 2

How can indoor and outdoor landscapes assist in promoting physical activity?

Figure 1.2 | Goals and Objectives (by author)

Project Intent

This project involves methods found through researching existing studies and redeveloping them to be tailored to this project. The area of focus is Homestead assisted living facility in Manhattan, Kansas. This facility is the study areas where observations, questionnaires, and focus group interviews will be conducted. This study will use a focus group study to investigate user's preferences of activities, barriers limiting the use of outdoor spaces, and existing access to nature. Alongside this, an interview with the activities director at each facility will be done to determine the general health and ability of the residents participating in the study. By looking at different case studies, this study determines recommendations of strategies that have been done elsewhere and are applicable to this study. The outcome of this study is to provide design strategies that could be used to combat the barriers identified by the residents and to improve accessibility.

Motivations

Relevance to Landscape Architecture

This project looks at utilizing landscape design strategies that benefit an older demographic. While substantial research has been done pertaining to the needs of this demographic, the design application and phase that incorporates these research findings has been lacking. The synthesized research done for this project can be applied as a base for the profession when considering design strategies that benefit the senior demographic. My motivation for doing this project has been devel-

oping over the course of my time at Kansas State. I have always been interested in public health, and as our projects have involved community engagement more and more, it is a strategy I would like to use. By looking at user input and involving the community in identifying barriers that need to be addressed or identifying elements they want to see added, there is more support for change.

I chose to focus on the senior citizen population because it is one of the fastest growing demographics, and because citizens of this demographic are living longer and have a diverse range of abilities. Manhattan serves as a good area of study, with a variety of assisted living facilities in the area, both in the "for profit" and "non for profit" categories. Additionally, a few of these facilities have worked with Kansas State University in the past.

2. Literature Review

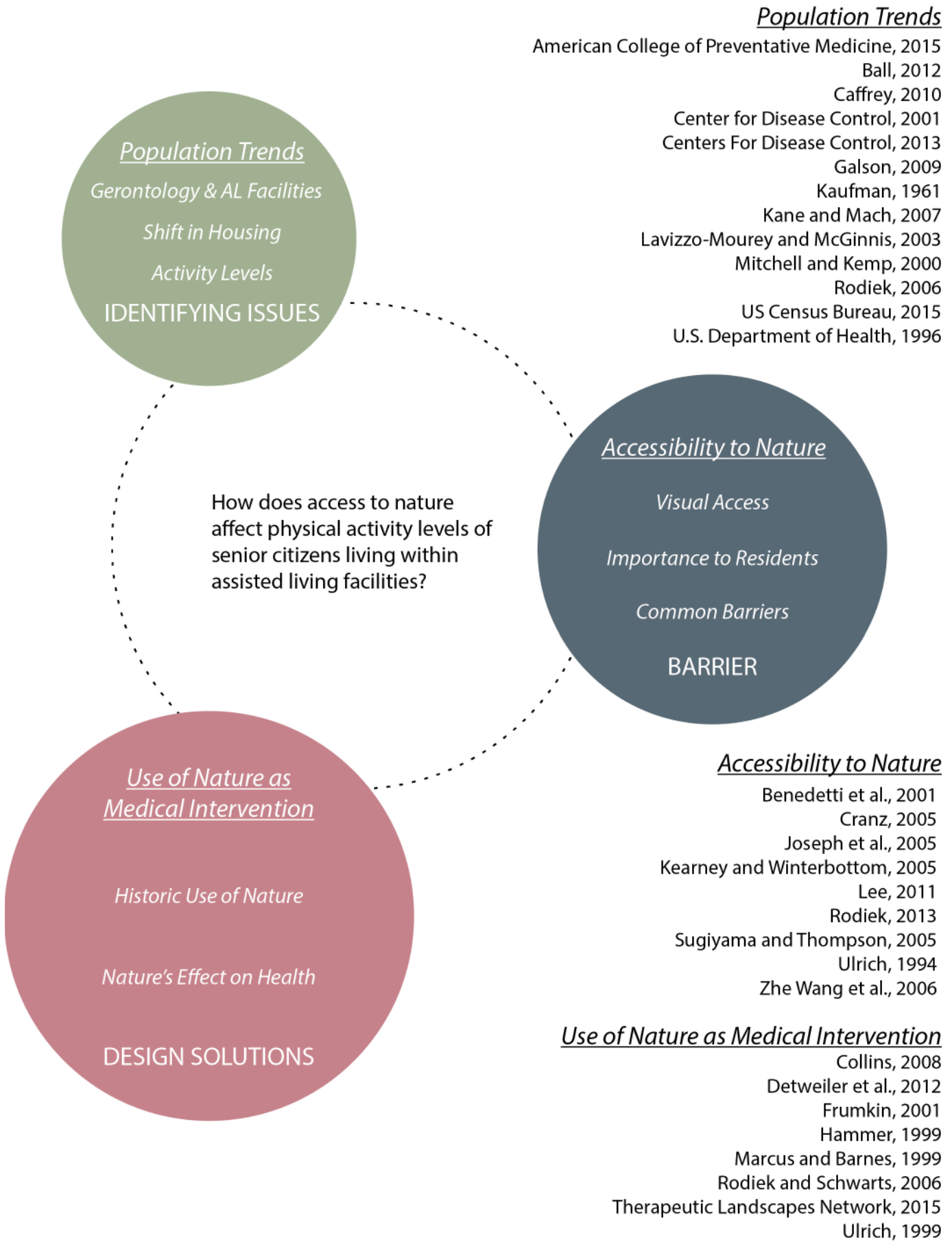


Figure 2.1 | Literature Map (by author)

Sources address three key concepts that identify the issues, common barriers, and design solutions.

Overview

There are three categories that were reviewed for this study; population trends, accessibility to nature, and the use of nature as medical intervention. The population trends portion of the literature review was used to identify issues that senior citizens are facing, including housing options and quality of life. Accessibility to nature was reviewed to see the benefits this has on outdoor physical activity, and identify barriers that might limit outdoor physical activity. By reviewing how nature can be used as a form of medical intervention, design solutions can incorporate nature for its restorative properties.

Population Trends

Gerontology and Assisted Living Facilities

The senior population is growing more rapidly than most other demographics. This demographic is being overlooked by designers, who seem to focus more on a younger demographic. (US Census Bureau, 2014; Kauffman, 1961) Assisted living facilities are important to a community because they offer an opportunity for senior citizens to remain active. The main reason for moving into an assisted living facility is because of declining health issues or the loss of a spouse. When seniors need help caring for themselves, there are two primary options, either a nursing home or an assisted living facility. Nursing homes offer more structured medical care, but assisted living facilities give residents more freedom and independence. While aging in place is said to be most preferred by seniors, assisted living seems to be the next viable option. Moving from one's own home into an assisted living facility can drastically change a person's perceived well-being. Aside from this, many seniors age 55 and older suffer from ailments associated with inactivity, discomfort from aging, and other physical health problems such as diabetes (Collins, 2008; Kauffman, 1961; Kane, 2007; Mitchel, 2000).

Shift in Housing

A challenge that designers are currently facing is proposing strategies that support the ever-aging population. Citizens are living longer lives, but communities that have

been designed have been focused on a younger demographic who are more able to drive and commute. With a lack of trails, destinations, and sidewalks within close proximity, communities make it difficult to maintain health and pose a risk for a senior citizen to develop a chronic illness. In addition to this challenge, the increased longevity is contributing to a diverse mix of residents that live in assisted living facilities with a varying range of abilities and ages (Ball et al., 2004; Ball 2012).

Activity Levels

The amount of physical inactivity can lead to a diminished quality of life in older adults because without this activity, the aging population is more susceptible to other ailments. The ten most common chronic conditions among residential care residents include high blood pressure, dementia, heart disease, depression, arthritis, osteoporosis, diabetes, chronic obstructive pulmonary disease, cancer, and stroke. These chronic conditions are the primary causes of inactivity in older adults (Centers for Disease Control, 2013). Both of these issues, a change in residential environment and the declining physical activity levels, have contributed to a diminished quality of life for the residents of assisted living facilities.

Accessibility to Nature

Visual Access

There have been many studies that have advocated for the visual access to outdoor space. Having visual access to nature can encourage residents to participate in outdoor activity or increase the use of the outdoor space. Aside from the physical health benefits, having visual access to nature can also serve as a mental health benefit, providing a connection between the resident and the physical world. Transitional spaces allow for residents moving from an interior space to an exterior space to prepare for the change. Visual access to nature is also important for the staff and caretakers of the residents, contributing to their perceived level of independence while using the space (Grant-Savelle, 2015; Joseph et al., 2005; Ulrich, 1984).

Importance to Residents

Professionals in gerontology, psychology, and other related fields have synthesized that nature is a viable method of bettering human health. Plants located within a senior citizen's daily environment, whether accessed physically or visually, can improve quality of life. Studies have shown that outdoor spaces can improve mood, sleep patterns, and even hormone imbalance, and physical activity levels (Benedetti, 2001; Collins and O'Callaghan, 2008; Ulrich, 1984). When outdoor spaces in senior housing facilities are underutilized, that is usually a result of poorly designed spaces or the spaces were not designed to meet the preferences of its users (Rodiek, 2013; Benedetti, 2001; Wang, 2006; Frumkin, 2001).

Barriers

The optimal space is designed to meet both the needs and preferences of the user. When a space is unable to meet these preferences and needs, the space becomes boring or unused. Additional studies have identified many different barriers that limit residents' use of the outdoor active spaces. Barriers that limit the amount of use a space gets include the design of the spaces, features on site, distance that has to be traveled, or physical ability of the resident (Cranz, 2005; Joseph et al., 2005; Ulrich, 1999; Rodiek, 2005).

Use of Nature as Medical Intervention

Historic Use of Nature

There has been a shift between methods of healing as new technological advances in medicine are developed. Prior to the use of technology as a method, access to nature had been a more significant method of treating afflictions. Biophilia is the hypothesis that humans have a tendency to seek connection with nature. There are many factors that help to define a person's quality of life, but this hypothesis has been looked at in many studies with the conclusion that contact with nature or a natural environment is one of the factors influencing a person's quality of life. (Benedetti, 2001; Wang, 2006; Frumkin, 2001; Marcus, 1999).

Nature's Effect on Health

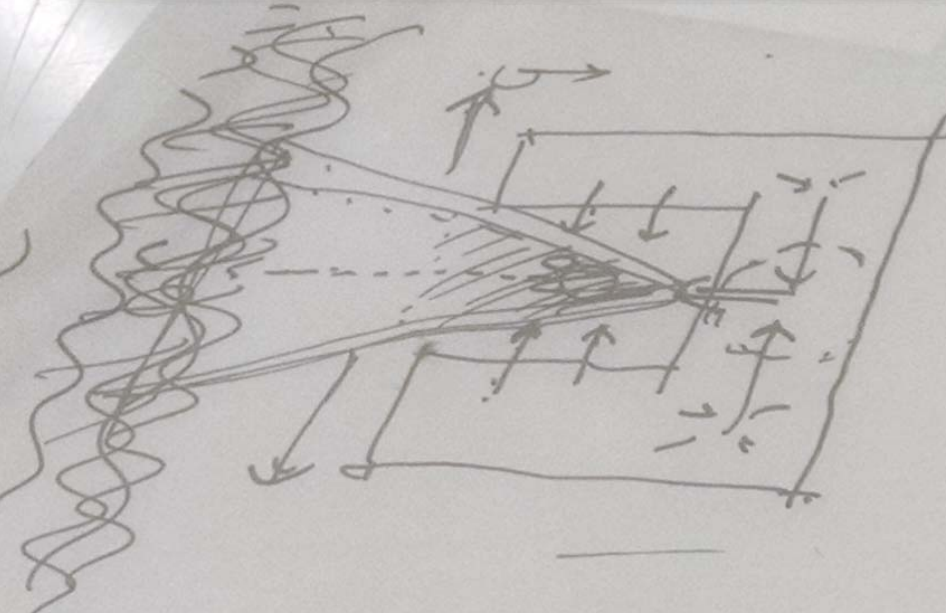
There are many benefits offered by healing gardens, but they can be synthesized into one of the three categories; relief from physical symptoms, reduction of stress, or improvement in the overall sense of well-being. These effects can be attributed to the different elements such as babbling water fountains, fragrant flowers, or vibrant shrubs, and how these types of elements stimulate the different senses (Marcus and Barnes, 1999; Ulrich, 1999).

Restorative landscapes, by definition, are landscapes that have the ability to make a person strong or healthy again. A type of restorative landscape is therapeutic gardens. Therapeutic gardens are designed to encourage outdoor activity, provide access to sunlight, and provide access to fresh air. These gardens could be used to provide assisted living residents access to outdoor space on a daily basis where senior citizens can safely and comfortably participate in exercise, reflection, or engage in social interaction. Recommendations when designing these types of gardens are to provide the user with a variation of elements, a diversified plant selection that both stimulates and attracts plant life, and seating areas to promote social interaction and reflection (TLN, 2015; Detweiler, 2012).

Stress is an important health outcome that correlates with a person's access to nature. Stress affects the mind, body, and behavior of a person. Stress can affect the mind by causing an emotional response such as fear, anxiety, or sadness. Stress can affect the body by raising blood pressure and causing an elevated respiration rate. Stress can affect a person's behavior in the form of either sleeplessness, helplessness or passiveness, depression, or even affect their level of socialization (Ulrich, 1999). Increased access to nature can be used as a method to relieve stress, therefore affecting a person's mind, body, and behavior.

Conclusion

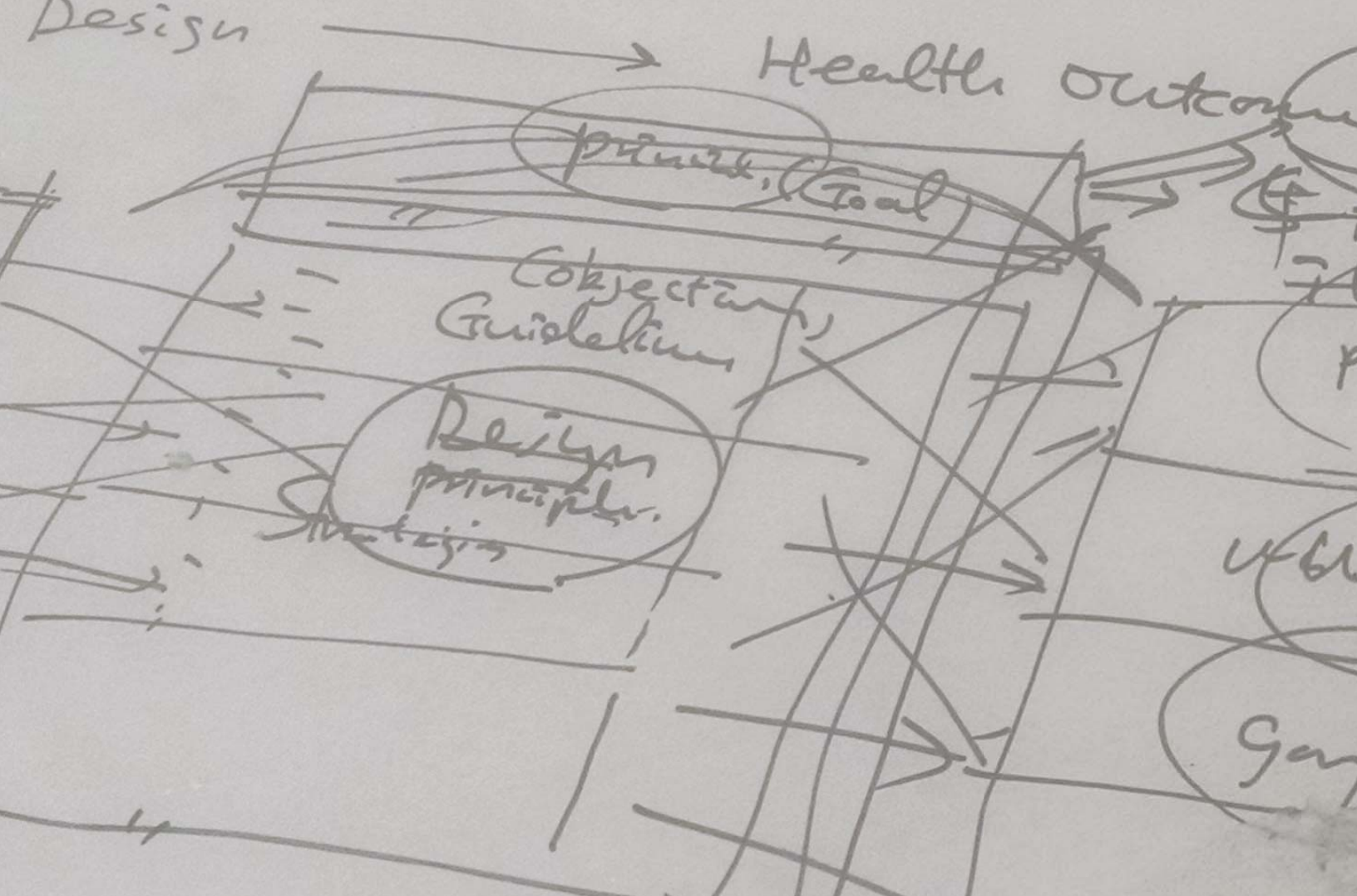
While the senior citizen population continues to increase, assisted living facilities are having to serve residents who vary in both age and ability. An issue that faces these senior citizens is high levels of inactivity and sedentary lifestyles caused by common chronic illnesses, which could lead to a diminished quality of life. By increasing both physical and visual access to nature, outdoor physical activity could be increased. Using nature as a form of medical intervention, the quality of life in assisted living facilities can be improved for the residents.



synthesis

Design

Health Outcome

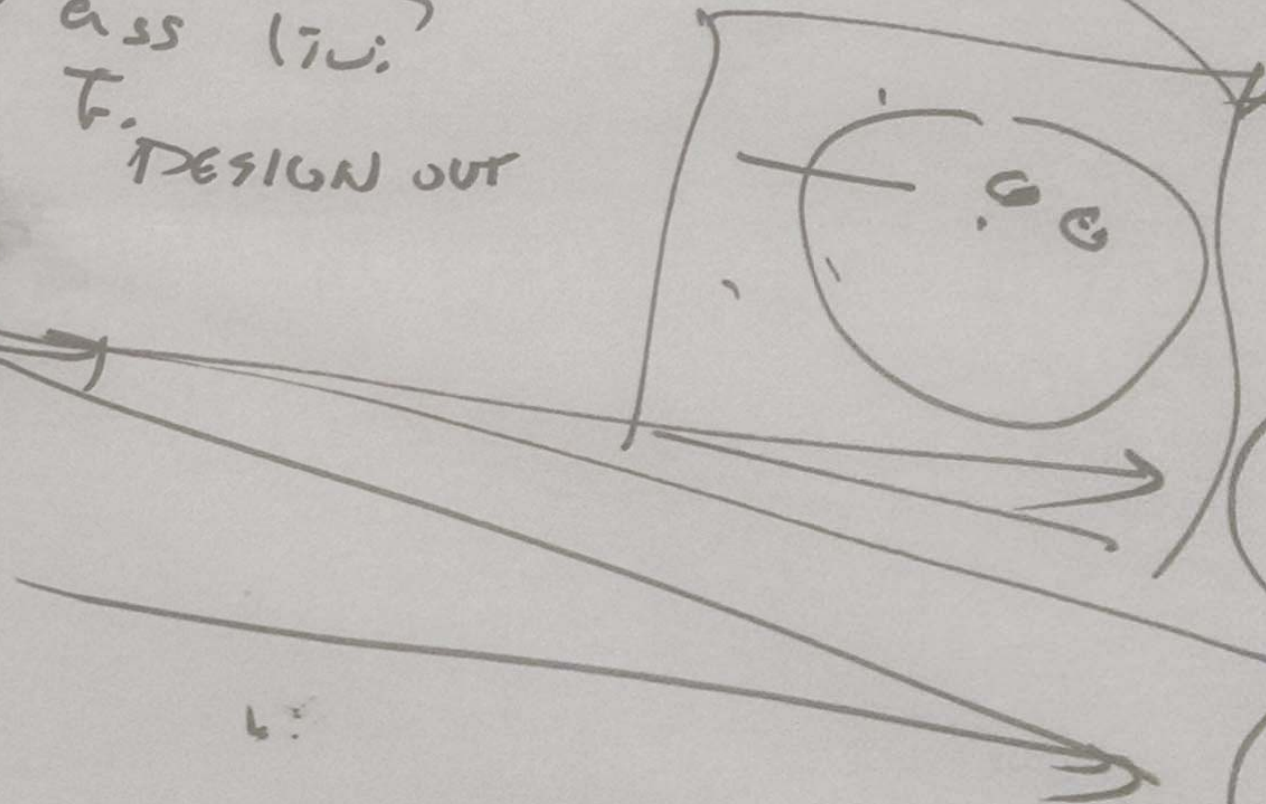


3. Methodology

Design solution
SIT
SP

7
Behaving
as li:
T.
DESIGN OUT

~~Residual~~
Attacks
Hobbes
layers
activity
life



Sentence

-/ > ue
social

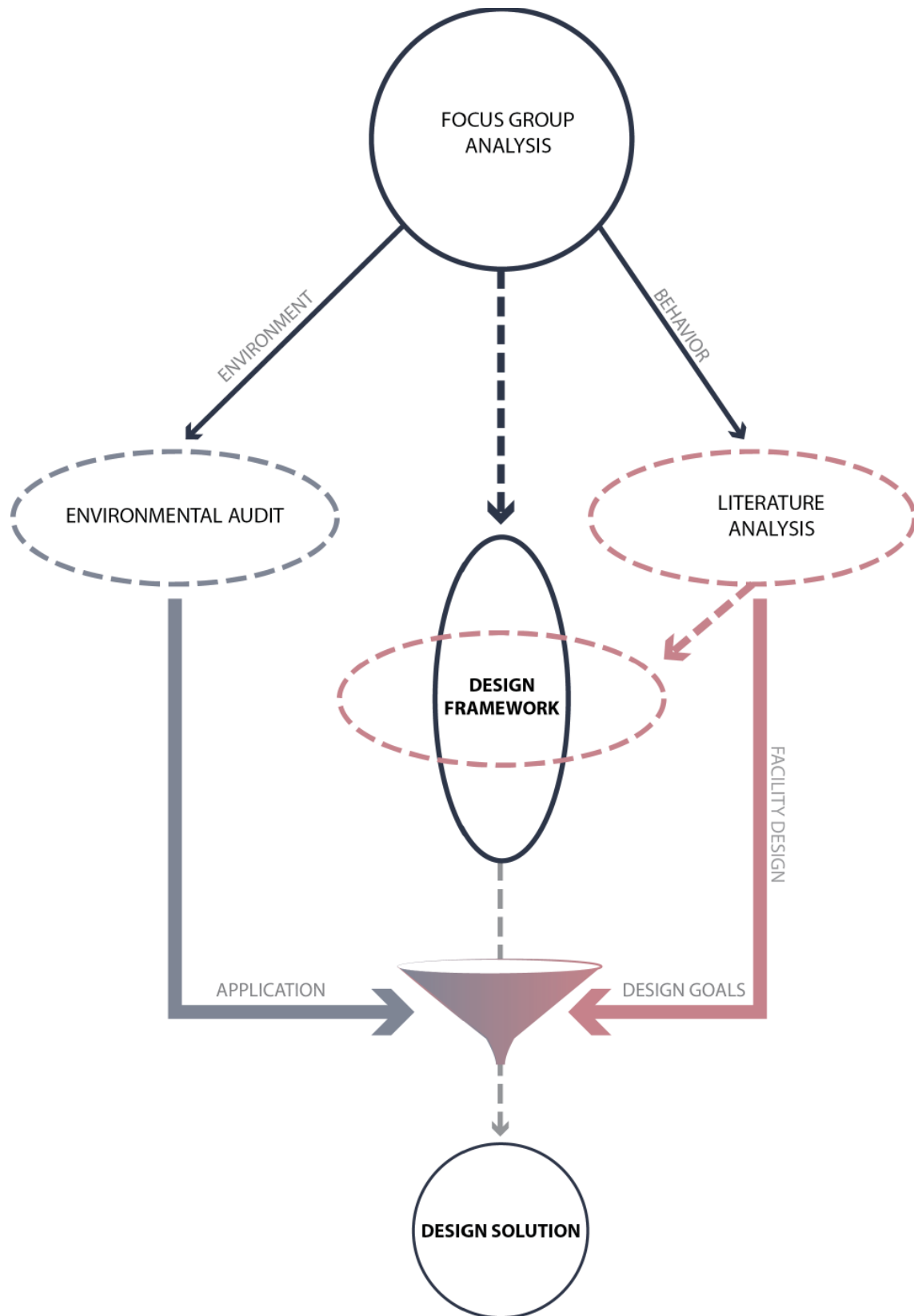


Figure 3.1 | Methodology Diagram (by author)

The three methods include a focus group analysis (user perceptions), a case study and literature review (behavior research) and environmental audit (site analysis and observations).

Target Population and Study Setting

Target Population

The study target for this project is senior citizens living within assisted living facilities in Manhattan, Kansas. Some facilities offer different living spaces including independent living, assisted living, healthcare households, transitional care, and gallery, but for this study, the target population is limited to residents living in assisted living spaces. These residents vary in their physical ability and may suffer from a variety of common chronic diseases including cognitive, ambulatory, and vision impairments.

Study Setting

Assisted living facilities offer residents the independence that seniors had been accustomed to, while also providing comfort and medical care when needed. The senior citizen population in Manhattan has grown by 7.2% from 2010 until 2014 (US Census Bureau) thus making it a suitable study area for this project. The study site is Homestead Assisted Living. Homestead is just one of many care facilities family-owned and operated by Midwest Health. While Homestead is an assisted living facility, Midwest Health also serves a variety of communities such as independent living, rehabilitation, skilled nursing, and memory care. There are 35 assisted living facilities that Midwest Health owns, split up between Iowa, Kansas, Missouri, Nebraska, and Oklahoma. The typical services offered at these facilities include a professional staff that offers 24-hour assistance, three home-cooked meals a day, assistance with bathing, dressing, and medications, housekeeping and laundry, and 24-hour emergency communication system.

Homestead Assisted Living Facility is a traditional, for-profit facility. While for-profit nursing facilities allocate fewer resources towards direct patient care, non-profit facilities are often owned by a group with religious, professional, or other affiliations. The majority of residential care facilities are for-profit. While there may be differences between for-profit and non-for-profit facilities, all the facilities still have to adhere to state and federal regulations. Homestead was chosen because it is a traditional facility in that it reflects the scale, structured

care, and for-profit mentality that is commonly seen in assisted living facilities. This fact is important because the methods and design solutions that are going to be recommended at this facility can also be applied at similar facilities. Manhattan was chosen because it is one of the ten largest cities in Kansas, and of those top ten, is growing in population more rapidly. Additionally, Manhattan's senior citizen population has increased by 7.5% from 2010 to 2015 (US Census Bureau).

Preliminary Site Analysis

Located at the corner of Little Kitten Ave. and Kimball Ave., the context surrounding Homestead is a residential neighborhood. While Kimball is an arterial road, Little Kitten Ave. is a smaller collector. A slight buffer of trees separates the facility from Kimball to the North-East, with smaller trees scarcely placed along the north side of the facility. A grove of mature trees as well as Little Kitten Creek fall along the west boundary of the facility's plot of land. To the south side of the facility lies a residential neighborhood, separated by the Homestead parking lot, a few mature trees, and an opaque fence. Also located along this south side are the utilities and dumpsters. To the east of the facility lies the entrance roundabout, parking, and green space separating the parking from Little Kitten Ave.

Paths

The paths surrounding the facility differ in width, varying between four and five feet. The courtyard space and the path leading from the courtyard space to the path along the west of the facility has a wider width to account for the users' abilities. While there are paths that lead around the exterior of the facility, the south side path does not connect to the other paths but rather, terminates at the edge of the parking lot. The views surrounding these paths vary from a natural wooded aesthetic to the west, a roadway to the north, residential to the east, and a courtyard in the middle of the facility. There is not much change in landscape surrounding the paths except along the front façade of Homestead and in the courtyard.

Typologies	Description
* Landscape grounds	Outdoor landscape areas that are usually located between buildings. Often these spaces are used as walking routes, outdoor eating spaces, or spaces for users who are in wheelchairs.
* Landscape Setback	Area in front of main entrance to a medical center that provides a buffer-separation between the building and the street. This space is not intended for use, but rather provides an appealing view as residents enter the facility.
* The Front Porch	This feature is at the front of the building's main entrance, usually serving as a drop-off or bus stop, and could include a covering, overhang, and seating.
Entry Garden	Landscaped area that is located at the front of a facility that is designed to be used.
* Courtyard	This space acts as the core of a building complex that is normally visible upon entering a hospital. This space contains natural features that provide various types of sensory relief.
Plaza	These spaces are furnished for outdoor use and predominantly hard-surfaced. They might include natural elements such as trees, shrubs, or planters, but the space feels more like a paved urban plaza.
Roof Terrace	An area that is an accessible outdoor area that is a long narrow balcony. Amenities for this space include plantings, various seating types, and positioning of seating.
Roof Garden	Area on top of a hospital building that is designed for the use of patients, staff and visitors. Sometimes can be viewed from hospital units and offices
Healing Garden	This can be either an outdoor or indoor garden that is specifically designated as a healing garden and designed with the appropriate amenities and plant types
Meditation Garden	Small quiet enclosed space that is specifically labeled with a plaque or some form of signage by the administration or designer
* Viewing Garden	This type of garden cannot be entered but only viewed from inside the building. These are normally enclosed in small spaces and are less costly than other types of gardens
Walk-in Garden	Similar to a viewing garden, this typology is a smaller garden that is able to be looked at from the indoor seating area. There is also the option for residents to walk into the garden and sit, but only a few people at a time.
* Utility Space	This space is used for parking, or utility placement including air conditioning units or dumpsters, etc.

Table 3.1 | Typologies

These typologies were adapted from the Center for Health Design to fit with this study.

* Of these 12, 6 typologies are present at Homestead Assisted Living

Advantages	Disadvantage
Advantages of this space is it ties the variety of buildings together into a campus like setting; this type of space can serve a variety of users and activities	Costly Maintenance Fees
Comforting view of Facility	Usually not intended for use
Provides rooms in the front of the building more privacy and better outdoor views	Normally does not have seating elements or pathways for exercising
Visual cue of main entrance	May be over used depending on amount of other outdoor spaces offered
Makes building more inviting	May be under used if parking is located under facility or away from the front porch.
Seating provides amenity for residents being picked up	
Easily visible and accessible	Exposure to parking and roadway may be overwhelming to residents and other users
Positive use of space	
Pleasant image to front of facility	
Provides residents with places to walk	Fishbowl experience
Semi-private and secure	Privacy of adjacent rooms may be at risk when people are using the space.
Easily visible and accessible	
Shielded from wind	
human scale	May not have therapeutic qualities such as greenery and color.
Low plant maintenance	May resemble shopping mall rather than peaceful passive space
Small space designed for heavy use	
Persons with disabilities can move easily through the space	
This space makes use of space that usually goes unused.	Weather and climate may play a great factor in when the space can be used. Additionally, microclimate may be an issue as well
There is a potential for great views	Full exposure to climate and other factors
Makes use of space that goes unused	Temperature may be uncomfortable for users due to heights of adjacent buildings
Private and uncommon for public use	Self-conscious feeling by users of space
Potential for expansive views	If garden is not specifically designated as such, the function may be confusing.
Disruptive activities will not be found in this space	Often, only 1 person uses space at a time
Thought given to therapeutic qualities	Self-conscious feeling by users of space
Quiet and contemplative space	Greenery can't be viewed or experienced up close, walked through, or heard.
This space has specific activities	Frustrating to 'Look but not Touch'
Green space contained in small area	Users may get the feeling of being too enclosed or inside of a "fishbowl"
Viewed from indoor seating area	
Low maintenance costs	Normally a larger space that is under utilized by pedestrians
Green outlook for waiting people	Uninviting, can be odor filled
Very quiet sitting place	
Lack of use will not invade privacy of adjacent rooms and offices	
Keeping utilities in same area can save room for other amenities	
Access to all utilities is advantage	

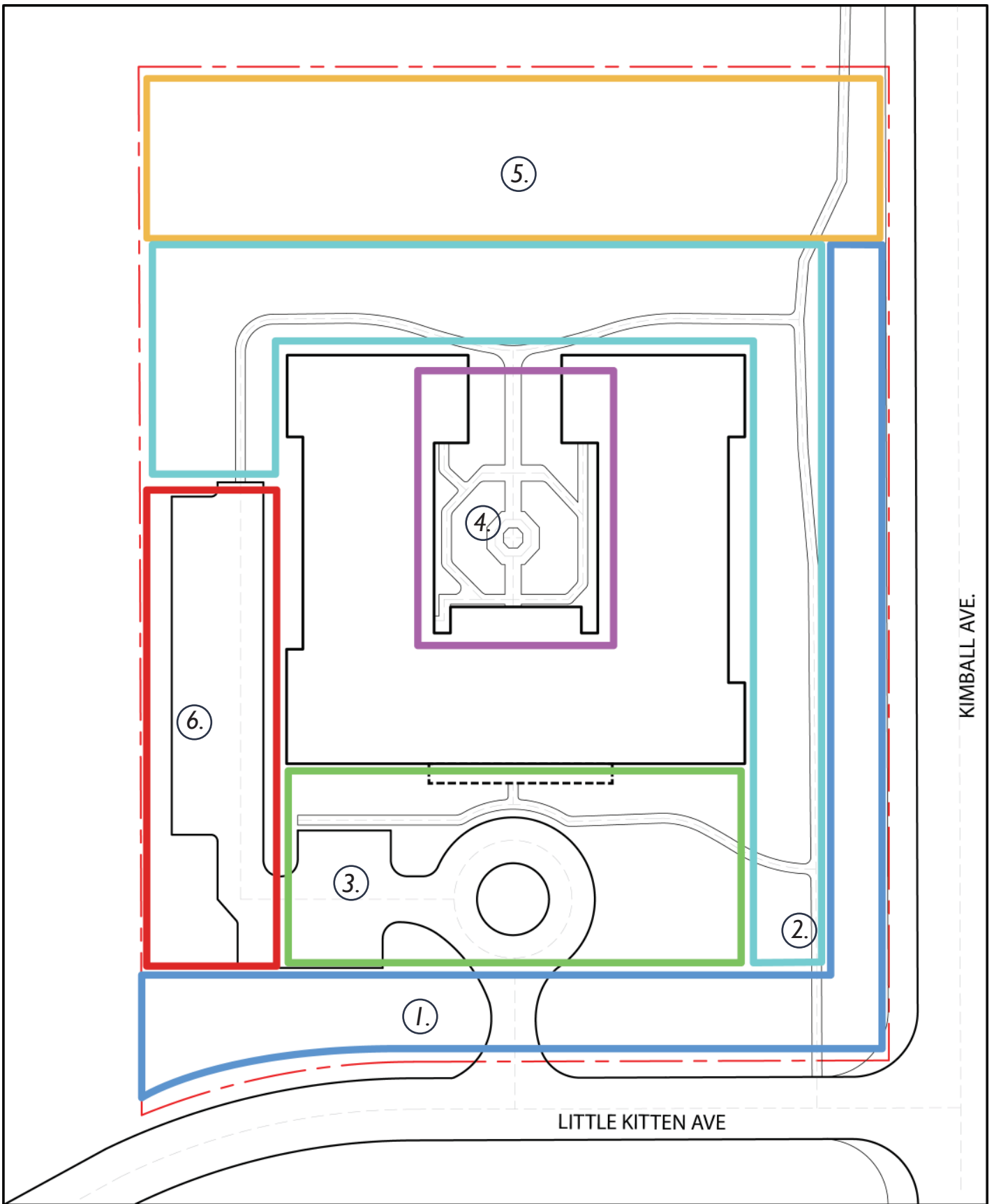


Figure 3.2 | Typologies (by author)

These typologies were adapted from the Center for Health Design to fit with this study. Of these 12, 6 typologies are present at Homestead Assisted Living.

Typologies

The typologies seen in Table 3.1 are adapted from the Center for Health Design to fit the typologies found in this study. There are 12 typologies outlined, but only 6 of those typologies are present at Homestead. These typologies include:

1. Landscape Setback
2. Landscape Grounds
3. The Front Porch
4. Courtyard
5. Viewing Garden
6. Utility Space

The landscape setback acts as the buffer zone between the building and the street and can be found along the northwest side of the site. The landscape grounds typology, as it relates to this study, is the area that can be used as walking routes. The front porch typology is located at the front entrance of the facility and is more manicured. This space is also made up of the drop off to the east of the building. The courtyard space is located in the center of the building and contains natural elements that help to provide sensory relief. The surrounding nature typology is a space that residents cannot physically interact with because they do not have direct access to it. In this study, this typology closely identifies with the creek and natural area to the west of Homestead. Finally, the utility space consists of different utility boxes, a dumpster, and site parking. A breakdown of these spaces will go into further depth within the next chapter.

Methods

Focus Group and Staff Interview

The goal of the focus group interview is to identify user perceptions and preferences of the existing outdoor space available to them. The population being surveyed

consists of 6-10 residents living at Homestead Assisted Living in Manhattan, Kansas. Residents have a diverse range of abilities and each had an opportunity to voice their opinions. Tools used to assist in these interviews were a recording device, a map of the facility, and images of the outdoor spaces to give residents a frame of reference when answering the questions.

Process

The interview began with residents first filling out a consent form, followed by the directions and rules for the discussion being described. The meeting was conducted in learning circles allowing all participants equal opportunity to answer each question. If a resident wished to be skipped, they could say pass until the end of the first round of discussion. If they came up with something to say, they could contribute at this time. Residents were asked to refrain from speaking out of turn. Two facilitators were used to help move the discussion along. The questions that were asked of the residents and how they relate to the research aims and objectives can be seen in figure 3.3.

Outcome

The outcome of this research was used to create design guidelines and to formulate design recommendations for the Homestead Assisted Living site. The goals of the design recommendations are to not only improve the aesthetic quality of the spaces, but to also ensure that the design response takes into account the users' suggestions, making sure that the design would be used by the residents. The findings from this method will be layered with the environmental audit, which is more of a site analysis of the facilities from a designer's view point. An additional goal of this layering is to see if there is a disconnection between how we look at design compared to how users perceive the space.

Focus Group Questions

Goals & Objectives

GOAL 1: Barriers Limiting Use

Outdoor Usage

Which outdoor space do you use the most and what do you use the space for?

Objective 1.1

Identify if the lack of information, spatial readability and familiarity of the existing green open spaces limits the uses of the residents.

Barriers

What do you think limits the amount that you use the outdoor spaces or causes you to be the most inactive?

Objective 1.2

Identify whether the lack of physical activity resources acts as a barrier that limits different uses by the residents.

Amenities

What elements do you feel are lacking in the outdoor spaces and what elements would you like to see added? Are you satisfied with the variety of spaces that this facility offers you?

Objective 1.3

Identify which undesirable elements or if the absence of desired elements makes it difficult for residents to use outdoor spaces.

Views

Does the window in your room look over a pleasant natural space, a parking lot, or a pathway and are you satisfied with this view? Does this have an effect on your amount of physical activity?

GOAL 2: Access to Nature's Effect on Physical Activity

Objective 2.1

Identify whether senior citizens who have better visibility to green open space are more willing to engage in physical activity than those who have worse visibility.

Objective 2.2

Identify whether senior citizens who have better accessibility to green open space are more likely to engage in physical activity.

Physical Activity

Do the outdoor spaces encourage you to be physically active while also providing you with areas to sit, meditate, or relax?

Objective 2.3

Identify how much senior citizen value green space accessibility regarding their health outcomes including physical activity.

Figure 3.3 | Goals and Objectives to Focus Group Questions (by author)

This figure shows how the focus group questions were tailored to the objective statements.

Environmental Audit

Process

The environmental audit is being conducted in order to observe the existing spaces offered by Homestead. While this method will also be used as a form of site analysis, observations will also include frequency and quantity of use. This tool will measure the level of contact with the outside world (outside the facility boundary), indoor and outdoor connectivity, freedom, choice, and variety available, comfort and accessibility of each outdoor space or trail. Included in the comfort and accessibility rating is the level of safety and security.

Outcome

The outcome of this audit is to see how much use the spaces get as well as to rate residents access to nature from personal observations of the outdoor spaces. This method will also be used alongside site analysis to identify areas that could be improved by design.

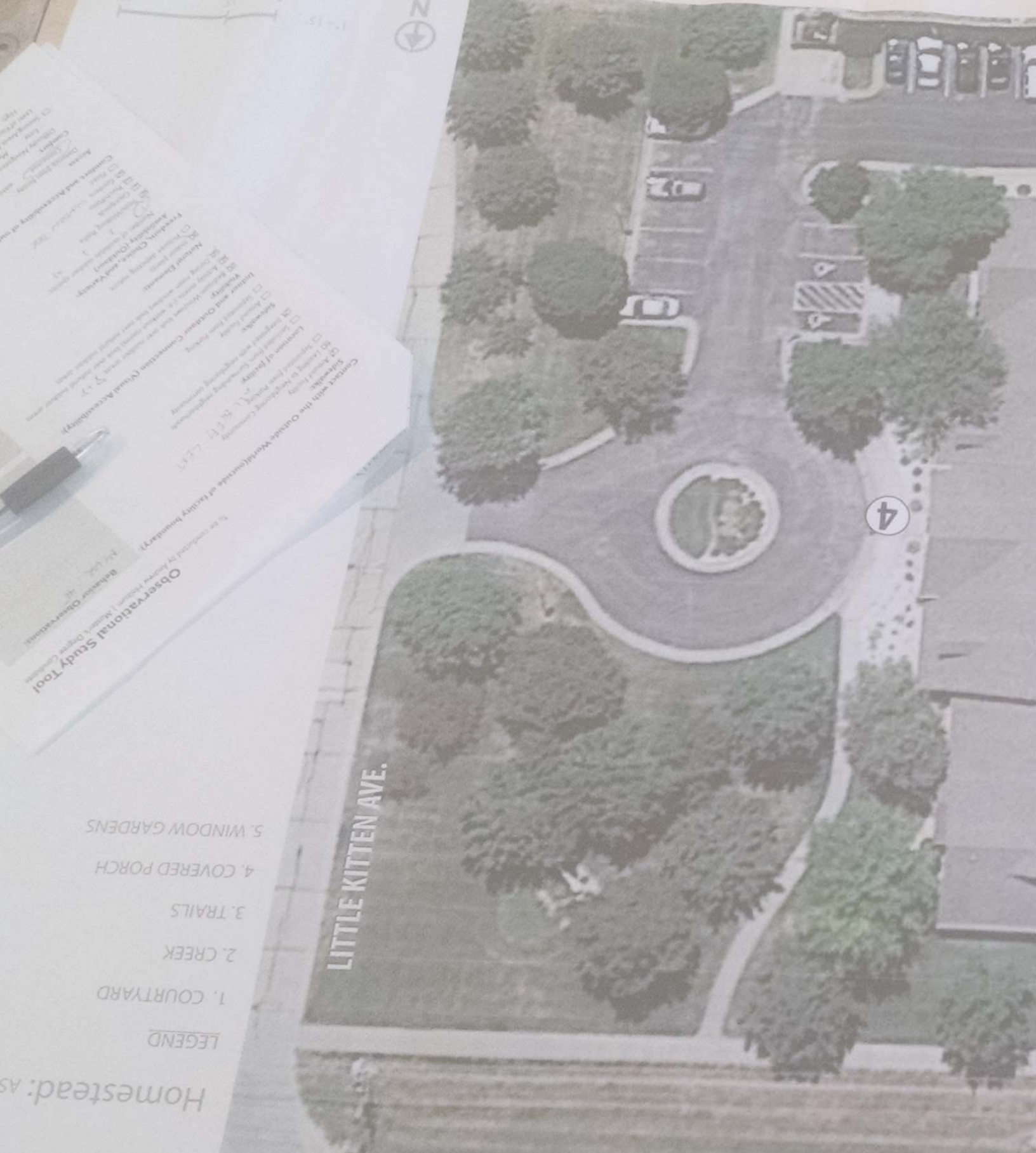
Case Study Analysis and Literature Review

Objective

The case study and literature review will be done to supplement the findings of the focus group and staff interviews. The focus group interview will identify the user's ability or disabilities, and the case studies and literature review will supplement that by identifying design strategies and recommendations for those specific users' needs.

Outcome

From the outcomes of each of these methods, a matrix will be created that will be used to produce design strategies for the facility. This matrix will incorporate the recommendations of the focus group, the site audit findings, and the recommendations for each of the identified users' disability, which will be uncovered in the literature analysis and literature review.

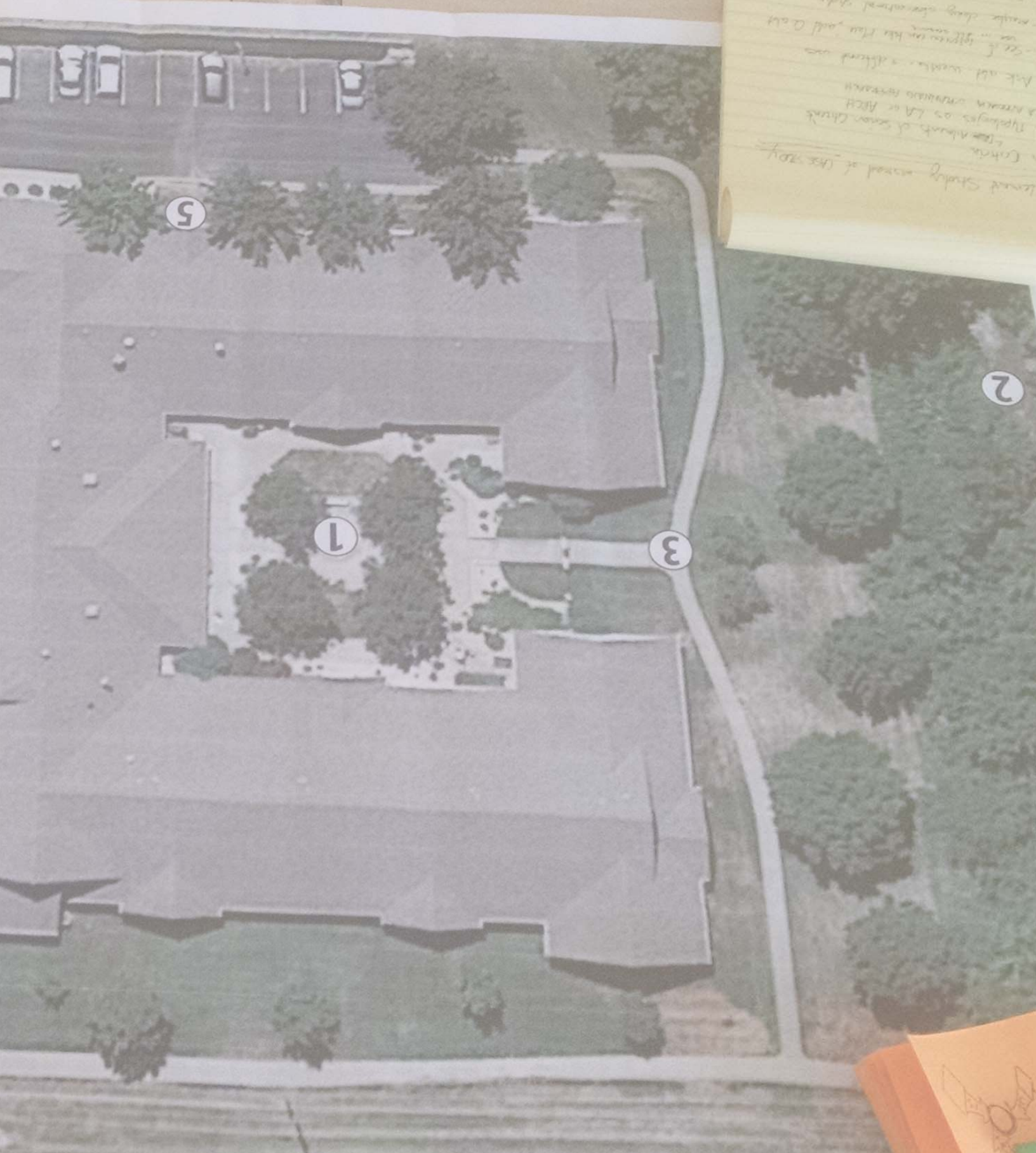


Homestead: as

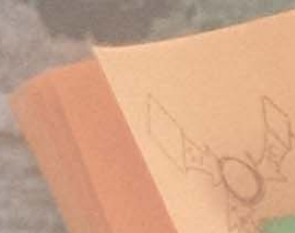
LEGEND

- 1. COURTYARD
- 2. CREEK
- 3. TRAILS
- 4. COVERED PORCH
- 5. WINDOW GARDENS

4. Findings



Land Study record of this study
Criteria
See Abstract of Simon Clark
Typology of LA or ARCH
A review contains research
Ask all works - attend
See if appropriate for this and call
make long abstract



This chapter is broken up by the three methods used in this study. The first section, the focus group analysis, reviews the responses of the residents and staff for each question, then compares the results and draws conclusions. The environmental audit follows this section, looking at each space individually, then synthesizes the findings. The final section in this chapter is the literature analysis method, which was used to support the findings in the environmental audit as well as support the design strategies that will be used. There are two scales that will be looked at in this section, the site level and the design component level. These results will be synthesized and applied in chapter 5.

Staff Interview and Focus Group

Homestead Assisted Living Facility Focus Group Overview

This assisted living facility has approximately 31 residents, of which 7 participated in the focus group interview. The focus group interview took place on February 8, 2016. According to the staff, residents use the outdoor space either daily or never. The age of the residents varies from 57-101 with an average age of 90. The most common chronic illnesses faced by the residents are dementia, Parkinson's, and stroke paralysis. Another common chronic illnesses commonly faced in assisted living facilities and within the senior population age 55 and older are illnesses affecting eye sight such as macular degeneration, glaucoma, and cataracts.

FINDINGS AT A GLANCE	
Frequency of outdoor use:	Study Specifics:
Daily or never	February 8, 2016
Frequency of physical activity:	7 Participants
3x weekly	1 Interviewer
Number of Participants/Residents:	2 Facilitators
7/31	
Age Range:	
57-101 (average: 90)	
Common chronic illnesses:	
1. Dementia	
2. Parkinson's	
3. Stroke Paralysis	

Q1: WHICH OUTDOOR SPACE DO YOU USE MOST AND WHAT DO YOU USE THE SPACE FOR? HOW IMPORTANT IS HAVING THIS SPACE AVAILABLE TO YOU AND YOUR PHYSICAL HEALTH?

"I use this lunch hall three times a day."

"I like to go out and sit in the courtyard... I sit and enjoy the birds and then I walk; try to make a couple rounds."

"I use the courtyard because I have a little dog and I take her out there and if it's cold, I can leave her out there and sit and watch her from inside."

"Sometimes, if it's nice weather, I will take her out and walk around the whole perimeter."

"I have a bird feeder that I like to look at from my window... I walk a lot, but I don't go outdoors, I walk in the halls. I am scared of the sidewalks with cracks and I don't see well... I don't want to fall."

"I use the courtyard, sometime I sit outside on the front porch... It is very nice with the landscape, but the trees lost all their leaves really early."

"I think they (outdoor spaces) are nice, I don't use them, but I think it's a good idea... I go outside and get in my son's car and they live in Manhattan and have a nice yard and trees."

"Window Garden... I have been here five years and I didn't know that."

According to the focus group, the most commonly used space is the courtyard and paths. The users of this space said that they use these spaces daily as a means of either exercise or meditation, or even walking pets. The other most common response, coming from 3 out of the 7

residents, was that they do not utilize the outdoor spaces at all besides looking out the window at them because they were afraid of tripping. All focus group participants said that having access to this outdoor space was very important to them.

Q2: WHAT DO YOU THINK LIMITS THE AMOUNT THAT YOU USE THE OUTDOOR SPACES OR CAUSES YOU TO BE THE MOST INACTIVE?

“Weather is the only reason.”

“No Complaints”

“The south side of the courtyard doesn’t get much sunlight... It gets pretty hot in the summer.”

“I go out in the snow but my dog won’t go out in the rain.”

“It is hot and there isn’t much shade.”

For this question, the residents mentioned that there is a pretty uneven distribution of shade between the north and south sides of the courtyard (refer to figure 4.1, Shade area). Additionally, there is a lack of seating options on the south side of the courtyard. In the winter, the south side of the courtyard stays icy, while the north side has no shade cover in the summer. The only other issue that limits use of the outdoor space is inclement weather. Maintenance of snow was mentioned, as well as the views that are sometimes blocked due to snow blowing. The participants who stated they do not use the outdoor space said it was due to fear of tripping (refer to figure 4.2).

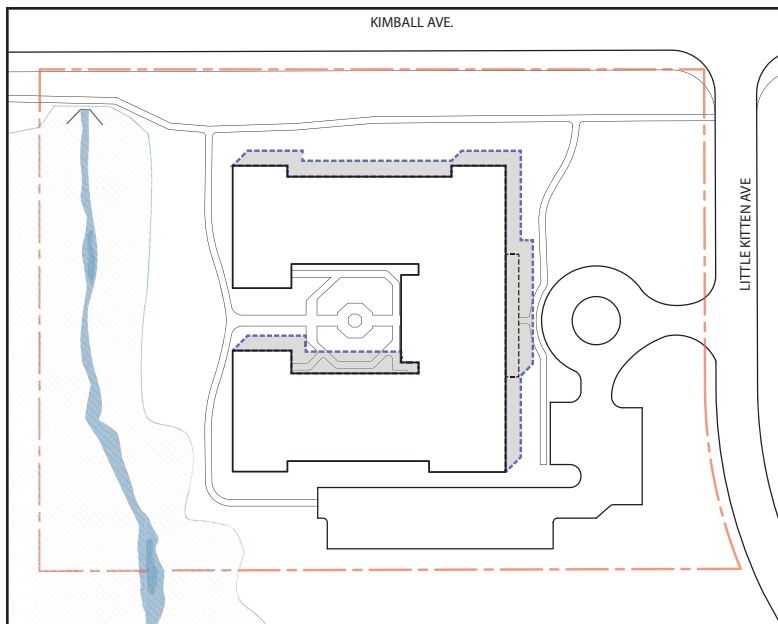


Figure 4.1 | Shaded Area (by author)

■ Primarily Shaded Area

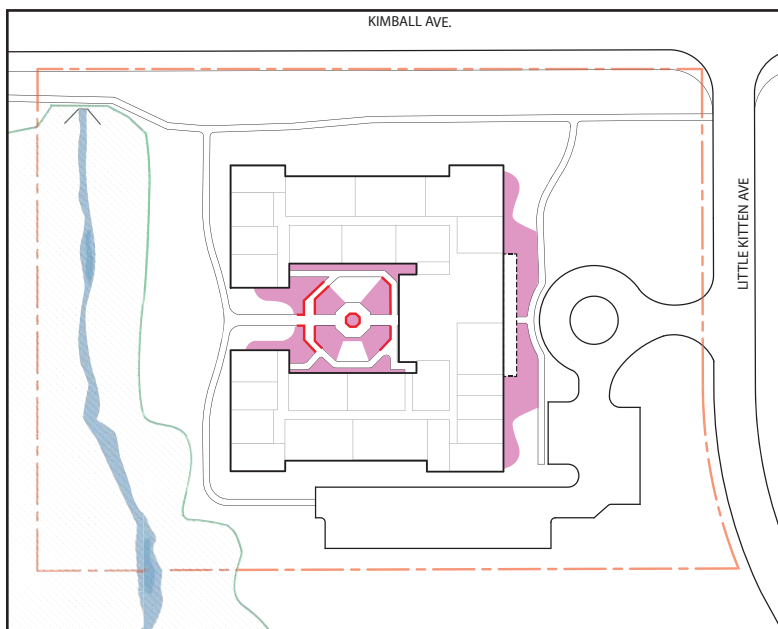


Figure 4.2 | Trip Hazards (by author)

— Low Site Wall
 ■ Loose Rocks



Q3: WHAT ELEMENTS DO YOU FEEL ARE LACKING IN THE OUTDOOR SPACES AND WHAT ELEMENTS WOULD YOU LIKE TO SEE ADDED? ARE YOU SATISFIED WITH THE VARIETY OF SPACES THAT THE FACILITY OFFERS YOU?

“I don’t know of anything that needs to be added... I think they take good care of us.”

“There are lovely roses out there in the summertime that just bloom and bloom and bloom. That’s nice to see, I don’t get out there, but I see it from my window.”

“Maybe we could paint the corners of the short walls, because I have fallen in the past... They could run into the corners... They don’t have to paint the whole thing, just so they can see the corners.”

“I wish we had more spaces than just the courtyard and out front, maybe garden space.”

“I would like to see a water feature or fountain, with some sort of fish, which would be really nice.”

“I like the idea of a water feature, especially in the summer when it is so hot to see the water and it cools you down”

Many of the participants in the focus group seemed happy with what was offered by the facility and stated how willing the facility was to meet their needs and requests. Residents are able to voice their opinions to the facility and are generally well taken care of. One comment that was heavily agreed upon was that the corners of the low walls should be better distinguished or contrasted either by painting the edges or changing the material because these walls were the greatest trip hazards in the courtyard space.

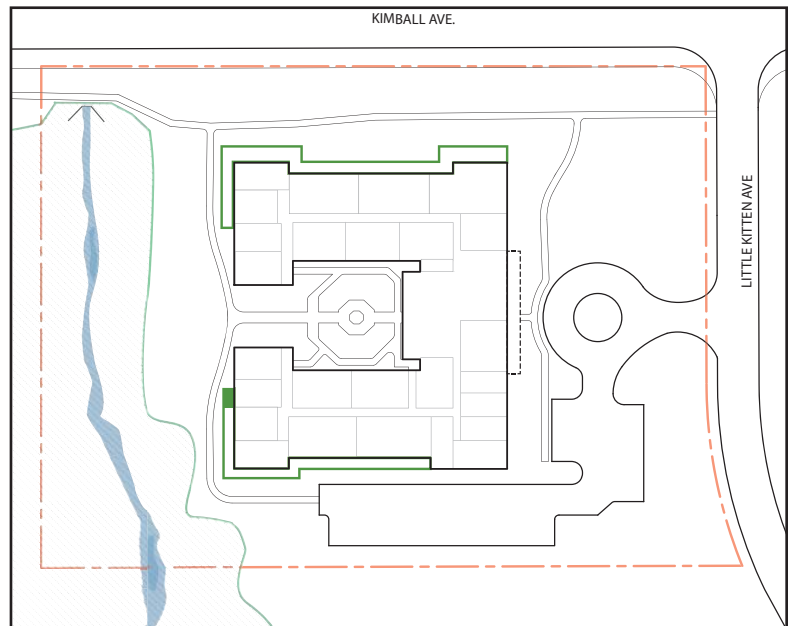


Figure 4.3 | Garden Space (by author)

— Available Garden Area
■ Garden Plots

Currently, one resident (not participating in the study) keeps a garden that produces fruit, but other residents have not taken advantage of this opportunity. Some didn’t seem to realize that they had this opportunity offered to them. Adding a water feature was also suggested for the ambiance of sight and sound, as well as for its cooling properties in the summer.

Q4: DOES THE WINDOW IN YOUR ROOM LOOK OVER A PLEASANT NATURAL SPACE, A PARKING LOT OR A PATHWAY, AND ARE YOU SATISFIED WITH THIS VIEW? DOES THIS HAVE ANY AFFECT ON THE AMOUNT OF PHYSICAL OUTDOOR ACTIVITY YOU ENGAGE IN?

“Front... I can’t raise my blind up, but I see a lot of traffic coming in and out.”

“My apartment looks over the parking lot, which doesn’t bother me. I have never been out here in back (courtyard), because I’m afraid I am going to trip and fall over one of those corners (low walls).”

“My apartment overlooks the creek and some green space on the other side... and that is where I see the deer.”

“I have a beautiful view, and the sunshine comes into my room... and boy I really enjoy it.”

“I have a beautiful view... It encourages me to go outside when the weather is good.”

“My room looks over part of the yard and the parking lot with a couple of trees outside. I enjoy looking at the bird feeder on the tree.”

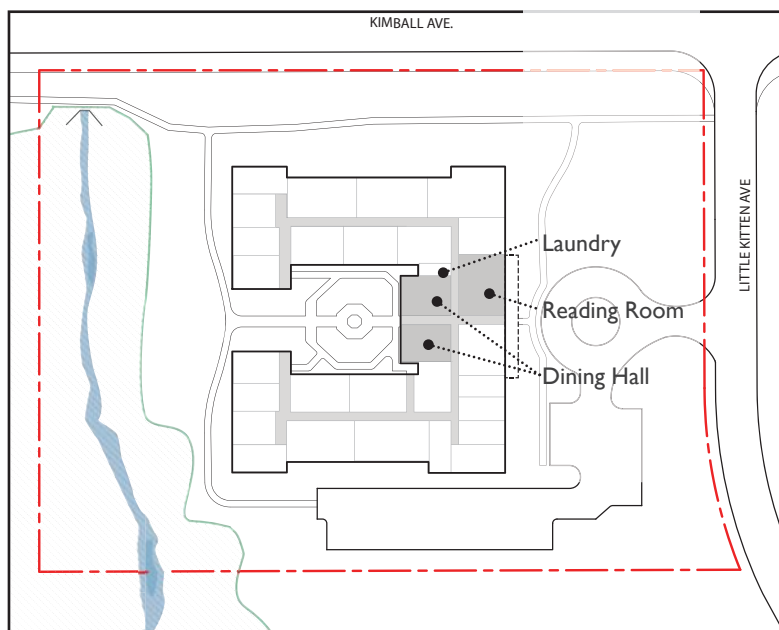


Figure 4.4 | Building Uses (by author)

- Residential Rooms
- Gathering Rooms
- Corridor

Of the 7 participants, 3 have views overlooking the parking lot. One of these residents does not mind this view because there is a mature tree directly outside of the window, where birds perch and visit the bird feeder frequently. Another says that he doesn’t mind the view, but it does not encourage him to be physically active or to go outdoors. Three residents that were participating in this study have rooms that overlook the courtyard or creek area. What was notable from the residents in these rooms was the amount of nature they have visual access to, whether it

is the sunlight that comes in their rooms, the birds that visit the bird feeders in the courtyard, or the deer that pass by the creek. Rooms along the north side of the facility are subject to some noise being located so close to Kimball Ave., the arterial road located to the north of the site.

Q5: DO THE OUTDOOR SPACES ENCOURAGE YOU TO BE PHYSICALLY ACTIVE WHILE ALSO PROVIDING YOU WITH AREAS TO SIT, MEDITATE, OR RELAX?

“The benches outside are great, and they have bud cans out there... I don’t know what else they could offer. If you suggested something to the lady who runs this place, and it was a good idea, I am sure she would do it.”

“No complaints... I like to go walk around.”

“I think it would be nice to have a pool... Even if its not very deep but you could walk in it. It is easier to do your exercises.”

“Yeah, I love the courtyard... make me want to take my dog out there (into the courtyard).”

“Dementia patients with wandering issues who want to go out the front door sit in the courtyard space and it brings their anxiety levels down.”

“I like the idea of marking the edges to reduce the fear of tripping.”

There are different amenities that encourage residents to use the outdoor spaces, but not necessarily be physically active. In the courtyard, the focus group participants noted that the bud cans encourage smokers to use the space. One participant uses the outdoor spaces because she likes to walk her dog, and the residents who have dementia are encouraged to use the courtyard space as a means of calming. Another focus group participant suggested adding a pool as a means of offering a different way to exercise. The last comment suggested was eliminating tripping hazards or making them more apparent in order to encourage more use.

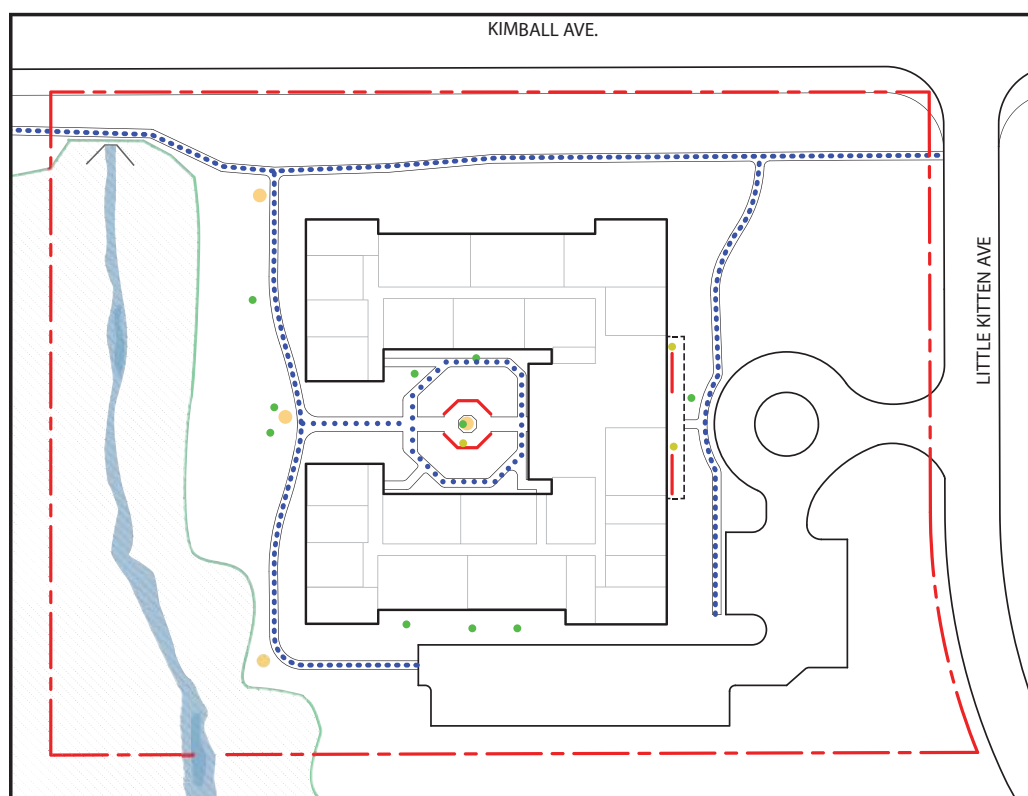


Figure 4.5 | Encouragement (by author)

- Dog walking path
- Seating
- Bird Feeder
- Lighting
- Bud Can

Space I | Courtyard

The courtyard space is connected to the facility. This space is easy to navigate, with wide paths throughout to allow access to residents in wheelchairs and others facing ambulatory, cognitive, or visual impairments. There are roughly 14 seats available, from single seats with cushioning to wooden bench seating. There is medium level of visual interest, with tree cover, bird feeders, and different types of plants and ground cover. This space is enclosed by a fence that requires a code so that residents with cognitive disabilities do not pose flight risks. Visual trip hazards within this space include low site walls and rocks that are used as ground cover.

There were no users of this space during the time of observation due to inclement weather and low temperatures. There are seven bird feeders, one of which was being used (located within the sun). Additional amenities located within the courtyard include three trash receptacles, and propane barbecue pit. There are a couple of light fixtures at the exits of the facility and a light pole at the center that enables residents to use of the space at all hours.

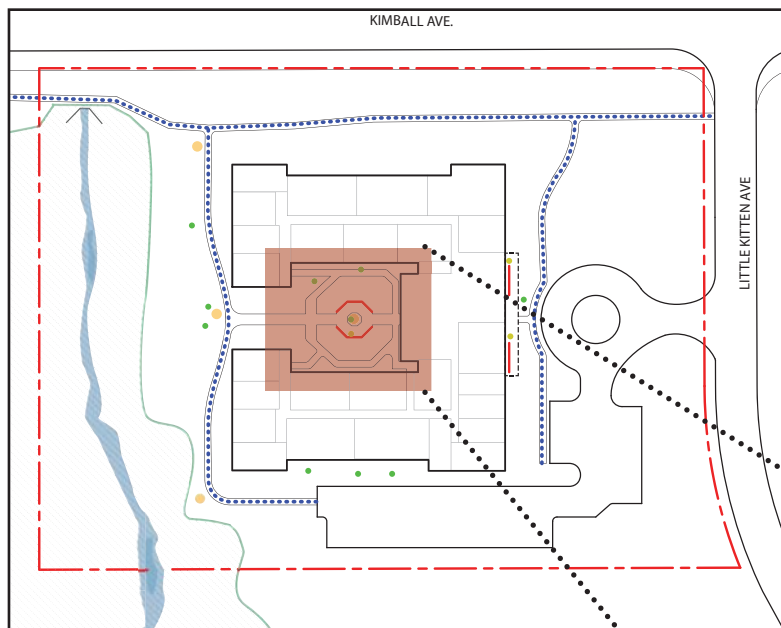


Figure 4.7 | Space I Location (by author)

Comfort and Accessibility of outdoor Space/Trail: # 1 *Courtyard*

<p>Access Distance from facility <u>Connected</u> within 100ft. >100ft.</p> <p>Comfort Difficulty Navigating Easy Medium Hard</p> <p><input type="checkbox"/> Seating Areas Available (# <u>14</u> seats)</p> <p>Level of Visual Interest from seating areas High <u>Medium</u> Low</p>	<p>Safety and Security (OMIT FOR TRAILS) Level of Enclosure (Omit for trails) <u>Enclosed</u> Semi-Enclosed Open</p> <p><input checked="" type="checkbox"/> Presence of visual trip hazards</p> <p><input type="checkbox"/> Separation of pedestrian and vehicular traffic</p>
--	---

HOMESTEAD

Figure 4.8 | Courtyard Audit Results (by author)

This audit tool used to evaluate each space takes into consideration access, comfort, and the level of safety and security.

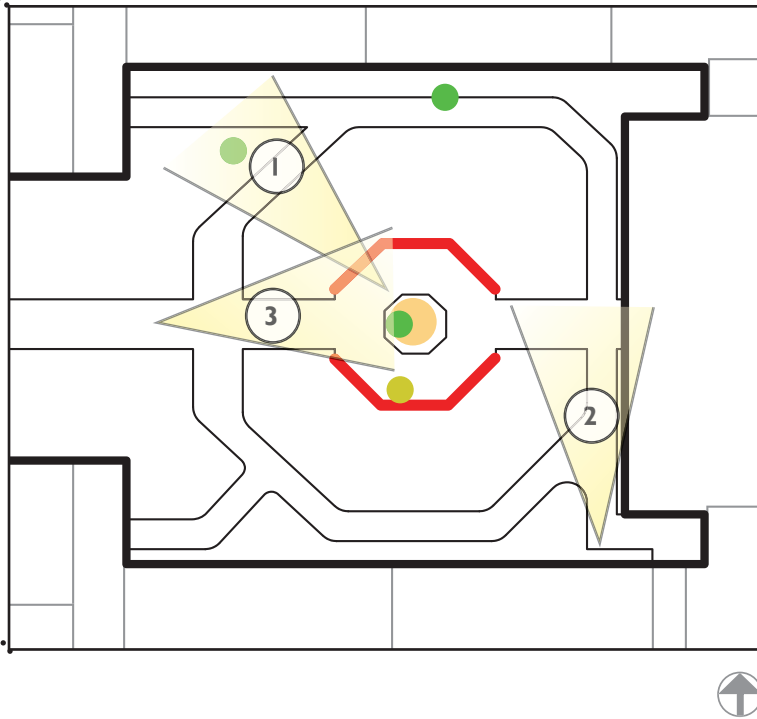
Figure 4.9 | Courtyard Bird Feeder*



Figure 4.10 | Low Site Wall*



Figure 4.11 | Courtyard Lighting*



*Photos by author

Space 2 | Creek

The creek area is located to west of the facility and has the most direct access from the back of the courtyard, though a code is required to exit the courtyard and enter the area adjacent to the creek. This space is accessible to the community as well as the residents of Homestead. There is currently no access to the creek other than visual access due to tree cover. Due to lack of seating elements, the space is mostly used visually by pedestrians passing by on the paths, or residents with rooms with windows facing west.

There is a high level of visual interest including different animals, vegetation, and the presence of water. This space is highly enclosed, with circulation routes limited to the north and south. After observing the space, trip hazards include fallen tree debris as well as rocks from the courtyard space. Observations also found that there is a lot of space that is unused between the creek and the homestead facility.

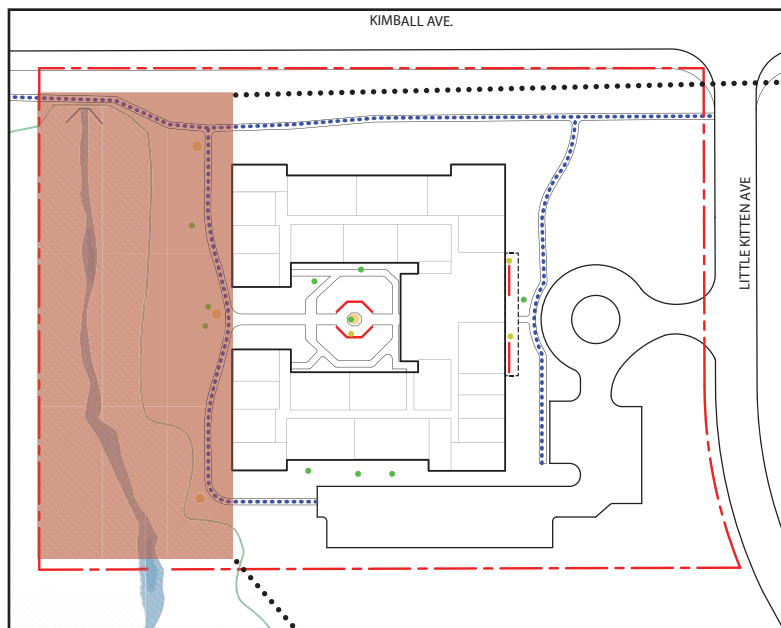


Figure 4.12 | Space 2 Location (by author)

Comfort and Accessibility of outdoor Space/Trail: # 2

<p>Access Distance from facility Connected <u>within 100ft.</u> >100ft.</p> <p>Comfort Difficulty Navigating Easy Medium <u>Hard</u></p> <p><input type="checkbox"/> Seating Areas Available (# _____)</p> <p>Level of Visual Interest from seating areas High Medium Low</p>	<p>Safety and Security (OMIT FOR TRAILS) Level of Enclosure (Omit for trails) <u>Enclosed</u> Semi-Enclosed Open</p> <p><input checked="" type="checkbox"/> Presence of visual trip hazards</p> <p><input type="checkbox"/> Separation of pedestrian and vehicular traffic <u>NA</u></p>
--	---

Figure 4.13 | Creek Space Audit Results (by author)

This audit tool used to evaluate each space takes into consideration access, comfort, and the level of safety and security.

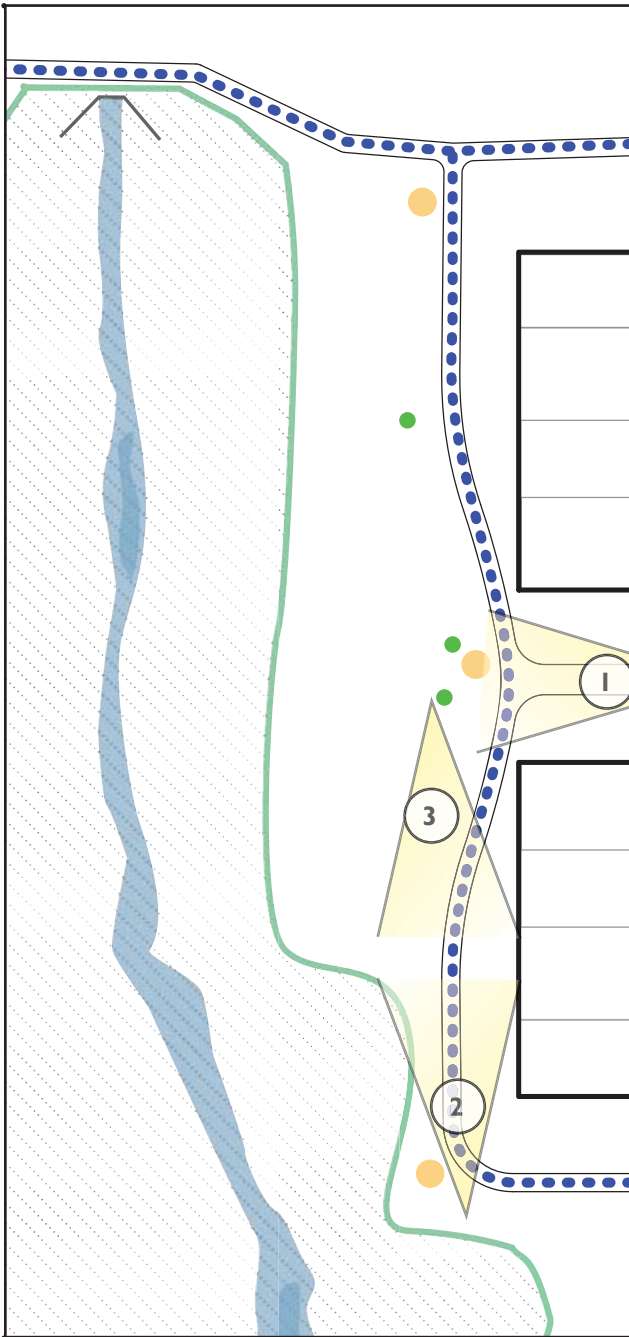


Figure 4.14 | Exit to Creek*

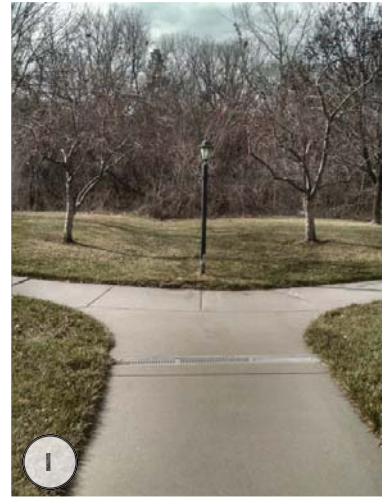


Figure 4.15 | Northern View*

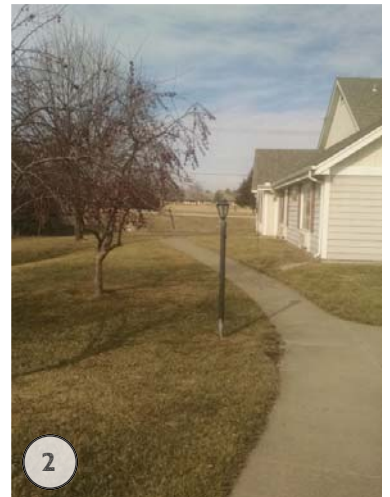
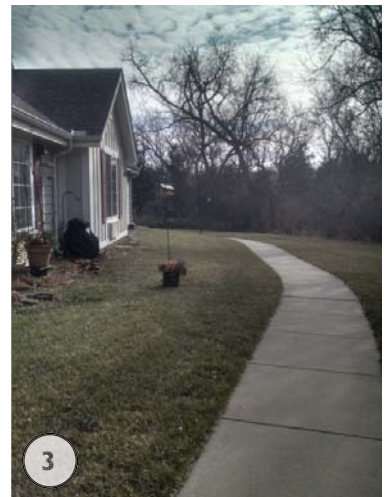


Figure 4.16 | Southern View*



*Photos by author

Space 3 | Exterior Paths

The pathways are about four feet in width, concrete, and are relatively flat, making them accessible for all users. Overall, the paths have a high level of visual interest, with the best natural view to the west of Homestead towards the creek. The views along the south and north sides of the site have the lowest level of visual interest, looking over either a parking lot or Kimball Ave. There are minimal trip hazards, mostly just white sheet rocks from the courtyard or front planter beds. The pathways on site connect to the surrounding sidewalks to the north, but are disconnected to the sidewalks along the Little Kitten Ave.

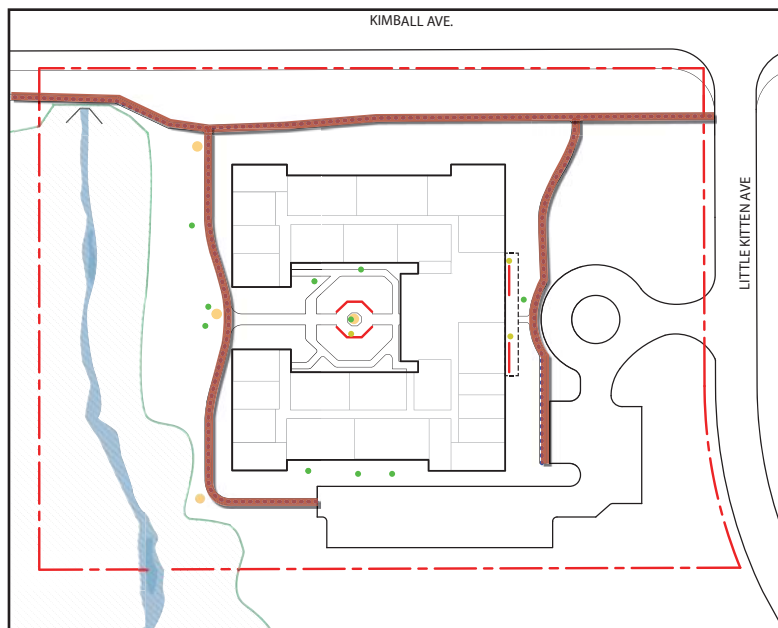


Figure 4.17 | Space 3 Location (by author)

Comfort and Accessibility of outdoor Space/Trail: # 3 Path

<p>Access</p> <p>Distance from facility Connected <u>within 100ft.</u> >100ft. window</p> <p>Comfort</p> <p>Difficulty Navigating <u>Easy</u> Medium Hard</p> <p><input type="checkbox"/> Seating Areas Available (# <u>NONE</u>)</p> <p>Level of Visual Interest from seating areas <u>High</u> Medium Low</p>	<p><i>Lifedoor's along Back near window</i></p> <p>Safety and Security (OMIT FOR TRAILS)</p> <p>Level of Enclosure (Omit for trails) <u>Open</u> 2 sides Enclosed <u>Semi-Enclosed</u> Open</p> <p><input type="checkbox"/> Presence of visual trip hazards <i>Rock from courtyard</i></p> <p><input checked="" type="checkbox"/> Separation of pedestrian and vehicular traffic <i>3 lamp Posts along path</i></p> <p><i>near creek ANIMALS Garden</i></p>
--	--

Figure 4.18 | Exterior Path Audit Results (by author)

This audit tool used to evaluate each space takes into consideration access, comfort, and the level of safety and security.

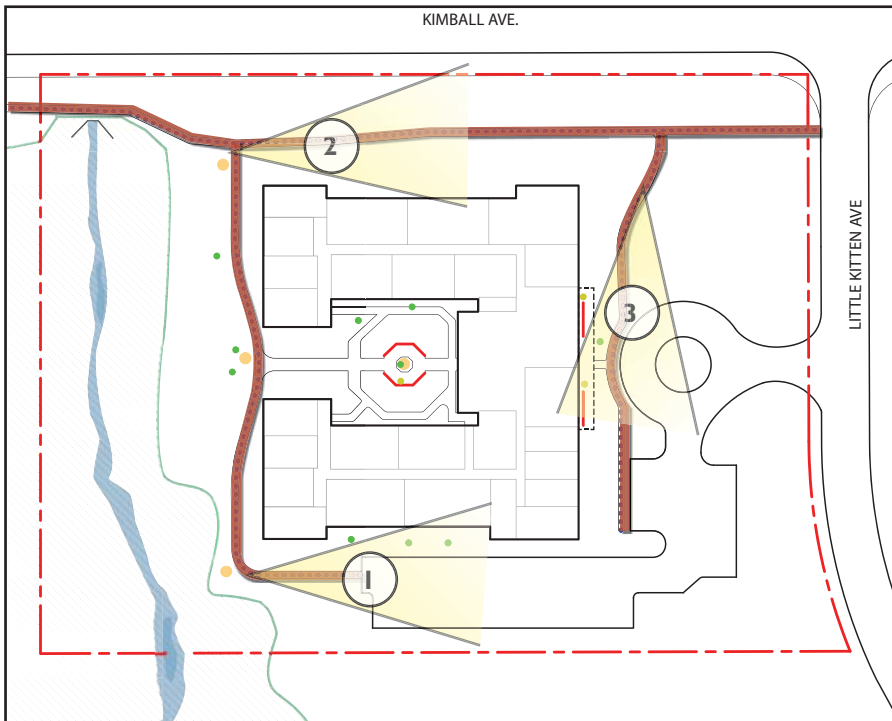
Figure 4.19 | View Towards Parking*



Figure 4.20 | View Along Kimball*



Figure 4.21 | Front View*



*Photos by author

Space 4 | Front Porch

The Front porch is intended to be a manicured space to show off the front façade of the assisted living facility. There is seating available at the front of the facility, with areas to wait to be picked up, or take a smoke break. There is a moderate level of visual interest in this space, with the opportunity for plant beds, tall trees, and landscape rocks for texture. These rocks, as well as the fallen leaves, act as visual trip hazards as they are located within the walking paths.

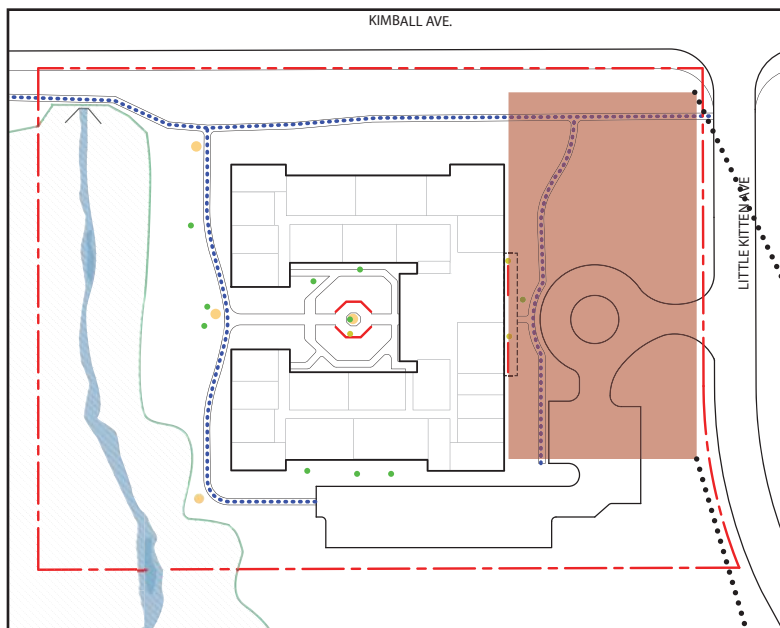


Figure 4.22 | Space 4 Location (by author)

Comfort and Accessibility of outdoor Space/Trail: # 4

<p>Access Distance from facility <u>Connected</u> within 100ft. >100ft.</p> <p>Comfort Difficulty Navigating <u>Easy</u> Medium Hard</p> <p><input type="checkbox"/> Seating Areas Available (# <u>10</u>)</p> <p>Level of Visual Interest from seating areas High <u>Medium</u> Low <i>PLANTS</i></p>	<p>Safety and Security (OMIT FOR TRAILS) Level of Enclosure (Omit for trails) Enclosed <u>Semi-Enclosed</u> Open</p> <p><input type="checkbox"/> Presence of visual trip hazards <i>LEAVES? ROCKS</i></p> <p><input checked="" type="checkbox"/> Separation of pedestrian and vehicular traffic <i>Side walk</i></p>
---	---

Figure 4.23 | Front Porch Audit Results (by author)

This audit tool used to evaluate each space takes into consideration access, comfort, and the level of safety and security.

Figure 4.24 | Front Bird Bath*



Figure 4.25 | Front Porch*

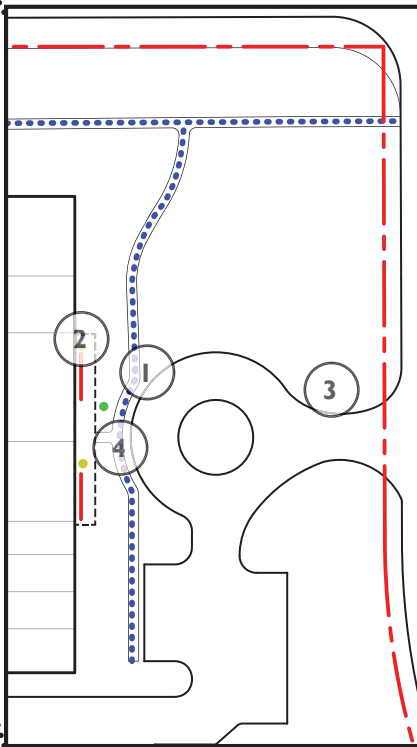


Figure 4.26 | Entry Approach*

Figure 4.27 | Landscape Area*

*Photos by author

Space 5 | South Side of Facility (Window Gardens)

This space can be categorized as utility space. There is currently no access to the green space in this area. Residents with rooms along the south side of the facility look over a stagnant parking lot, with only a couple of trees serving as a buffer. There are a few utility boxes along this south side as well as a dumpster to the very south of the site. There is a fence separating the Homestead facility and the surrounding neighborhood. Without connection to the path leading to the creek space, pedestrians using the path would have to walk in the parking lot to get to the front of the facility for the closest path.

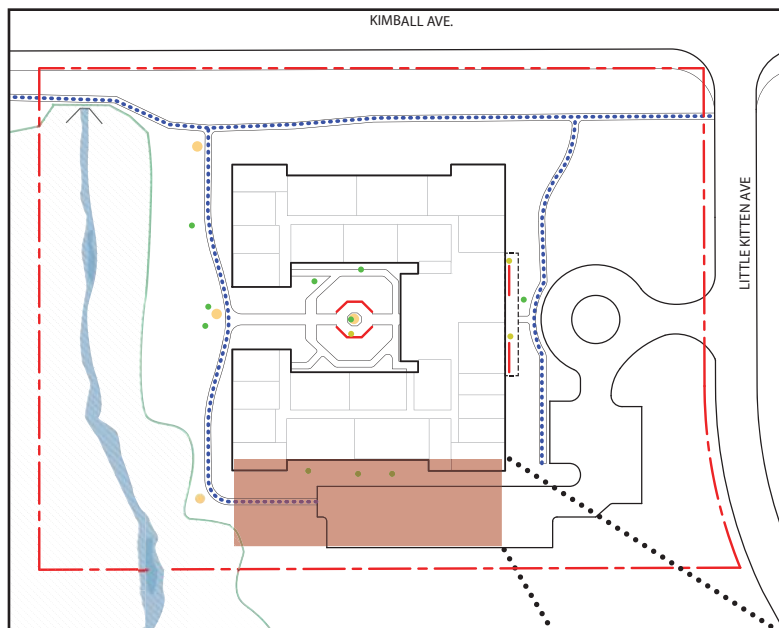


Figure 4.28 | Space 5 Location (by author)

Comfort and Accessibility of outdoor Space/Trail: # 4

<p>Access Distance from facility <u>Connected</u> within 100ft. >100ft.</p> <p>Comfort Difficulty Navigating <u>Easy</u> Medium Hard</p> <p><input type="checkbox"/> Seating Areas Available (# <u>10</u>)</p> <p>Level of Visual Interest from seating areas High <u>Medium</u> Low <i>PLANTS</i></p>	<p>Safety and Security (OMIT FOR TRAILS) Level of Enclosure (Omit for trails) Enclosed <u>Semi-Enclosed</u> Open</p> <p><input type="checkbox"/> Presence of visual trip hazards <i>LEAVES? ROCKS</i></p> <p><input checked="" type="checkbox"/> Separation of pedestrian and vehicular traffic <i>side walk</i></p>
---	---

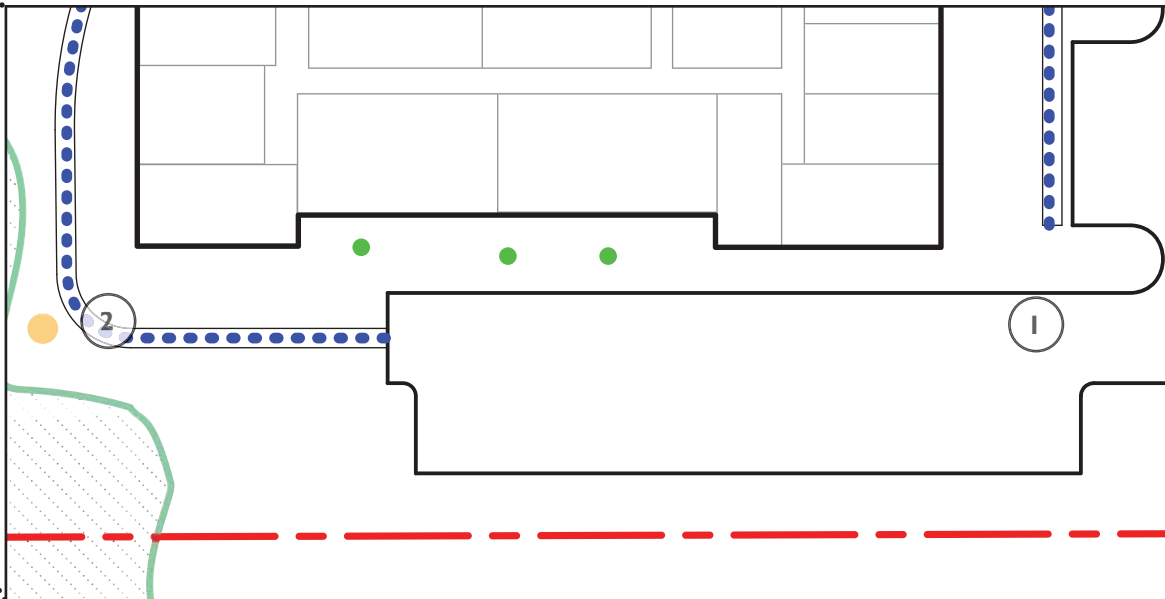
Figure 4.29 | South Side Audit Results (by author)

This audit tool used to evaluate each space takes into consideration access, comfort, and the level of safety and security.

Figure 4.30 | Retaining Wall*



Figure 4.31 | South Parking Lot View*



*Photos by author

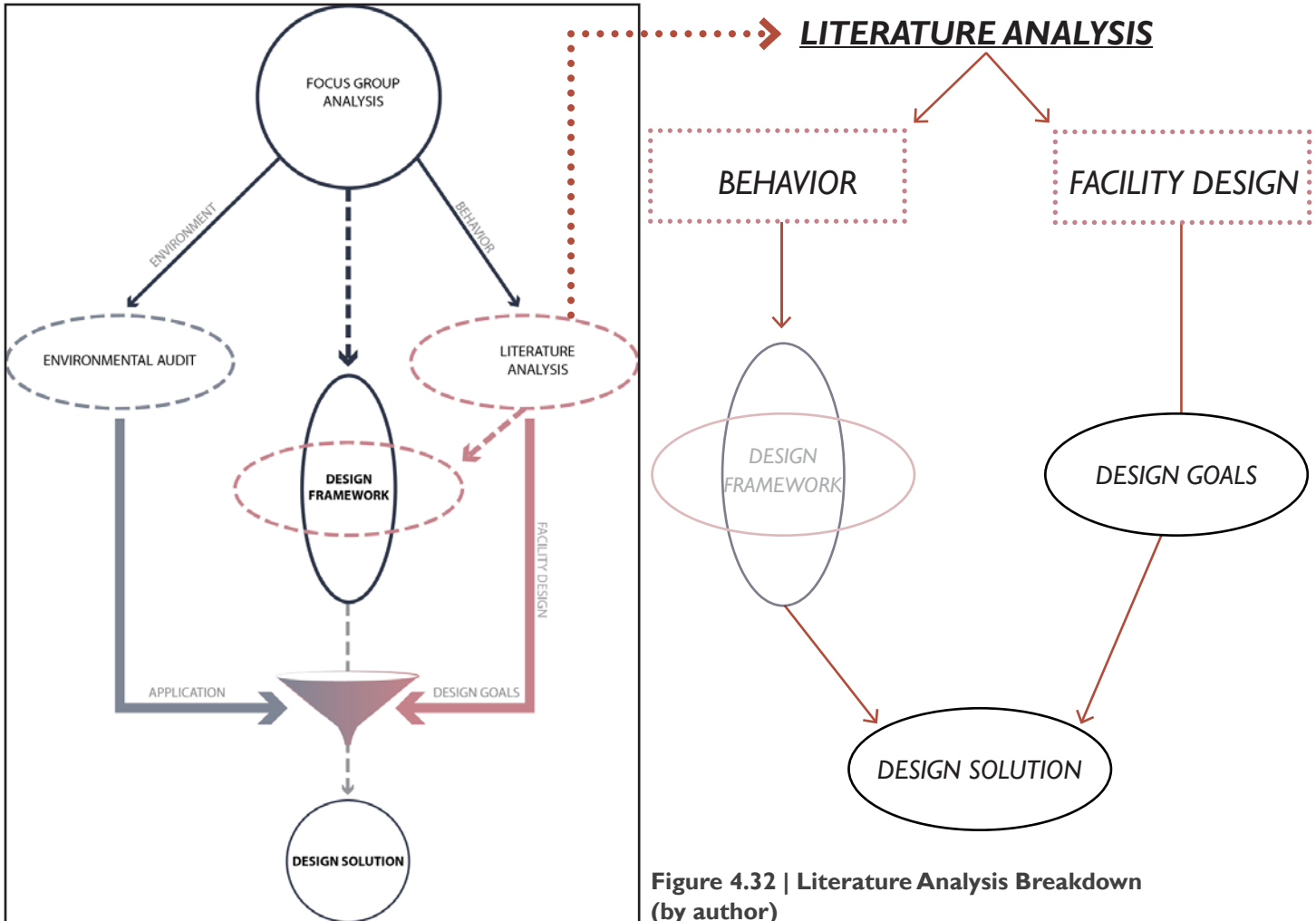


Figure 4.32 | Literature Analysis Breakdown (by author)

This diagram shows how the literature analysis is being broken down into a Behavior and Facility Design section.

Literature Analysis Findings

Overview

The literature review has two focuses, the facility design aspect and the behavior aspect. The facility design aspect will be used to identify goals for the different health outcomes, while the behavior aspect of the literature review will be used to identify recommendations for site amenities and design quality for each space depending on each user’s ability. The users’ ability that are being considered in the Behavior section of the Literature Analysis were identified within the focus group analysis section of the study. (Refer to figure 4.X, which shows the breakdown of the literature analysis method.)

Facility Design

The facility design aspect will be used to identify goals for the different health outcomes, joining typologies and principles to do so.

The site design aspect focuses on identifying different landscape types as well as strategies that can be developed into goals for design.

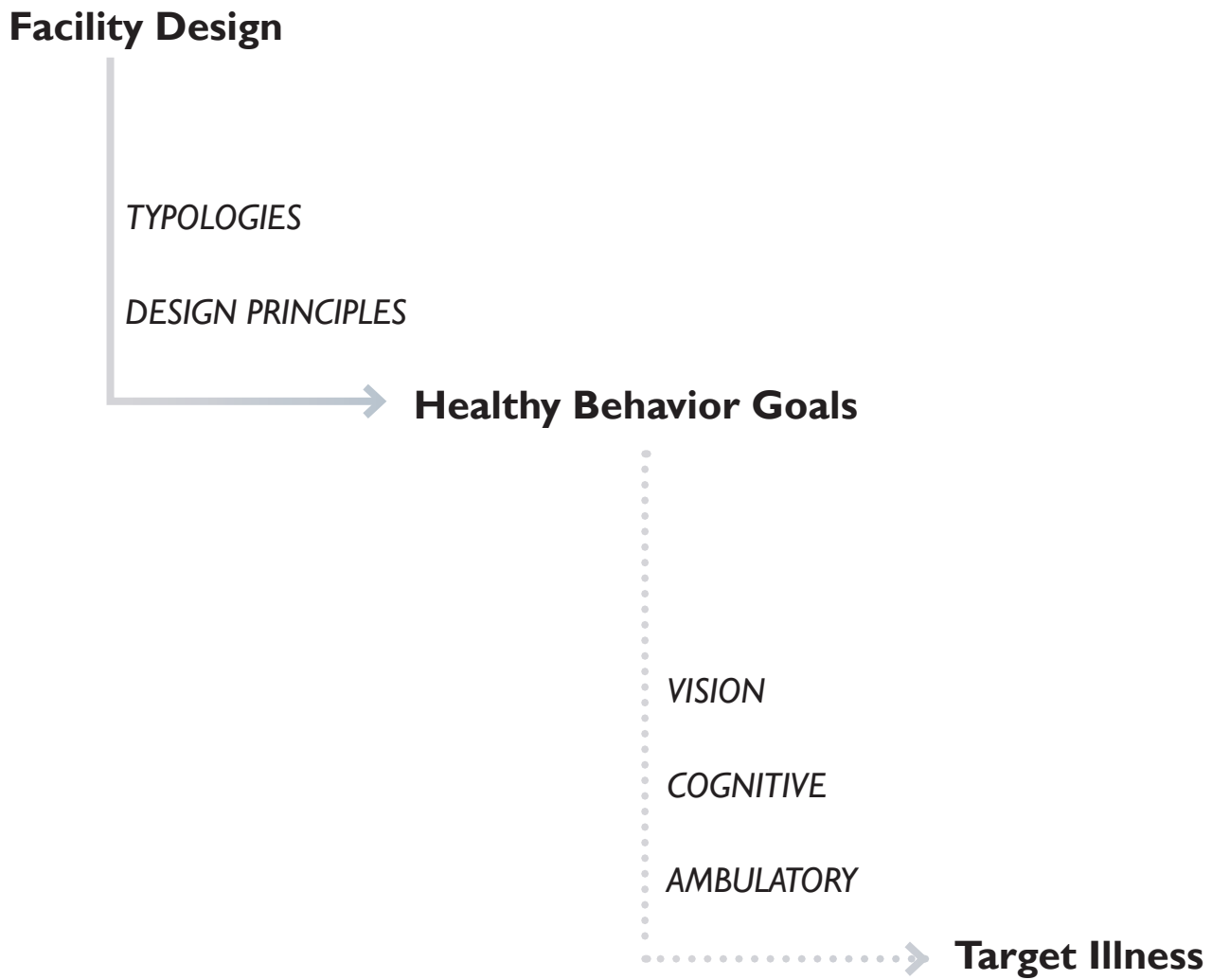


Figure 4.33 | Facility Design Structure (by author)

Facility Design

Healthy Behavior Goals

Typologies

There are thirteen different typologies that may be present at healthcare facilities. These can be broken up into four subgroups; the entry sequence, interior space, roof, and the garden landscape. Each of these landscape typologies have advantages and disadvantages, which can be seen in table 4.1.

Not all of these typologies will be used at each health care facility. Homestead Assisted Living Facility has six of the thirteen typologies including:

Landscape buffer-This typology is the space located between the facility and the street. The primary function of this typology is to serve as a visual and auditory buffer for the facility.

Landscape grounds- This typology is the active and passive walking paths and seating areas surrounding the facility.

Front porch- Located at the front of the facility, this typology is highly manicured and is used to highlight the front façade of the facility.

Courtyard- The courtyard space is considered an interior space in that it is semi enclosed by the facility on multiple sides. The courtyard is predominantly green space, and provides some form of sensory relief.

Surrounding nature- Surrounding nature is inaccessible, other than visually. This nature can be a dense vegetated area, or even an overgrown creek.

Utility space- This space houses the facility's utilities, but can also serve as parking.

Each of these spaces serve a different purpose, to the users and has a distinct characteristic. These spaces can blend together or be very distinguishable. Because of the demographic being considered, distinguishing the different spaces and their uses will be critical.

Typologies	
Entry Sequence	Landscape Grounds
	Landscape Buffer
	The Front Porch
	Entry Garden
Interior Space	Courtyard
	Plaza
Roof	Roof Terrace
	Roof Garden
GardenLandscape	Healing Garden
	Meditation Garden
	Surrounding Nature
	Walk-in Garden
	Utility Space

➔ Target Illness

Description	Advantages	Disadvantage
walking routes, outdoor eating spaces, or spaces for users who are in wheelchairs.	Advantages of this space is it ties the variety of buildings together into a campus like setting; this type of space can serve a variety of users and activities	Costly Maintenance Fees
Buffer zone located between the building and the street which is not intended for use.	Comforting view of Facility	Usually not intended for use
	Provides rooms in the front of the building more privacy and better outdoor views	Normally does not have seating elements or pathways for exercising
This feature is at the front of the building's main entrance, usually serving as a drop-off or bus stop, and could include a covering, overhang, and seating.	Visual cue of main entrance	May be over used depending on amount of other outdoor spaces offered
	Makes building more inviting	
	Seating provides amenity for residents being picked up	May be under used if parking is located under facility or away from the front porch.
Landscaped area that is located at the front of a facility that is designed to be used.	Easily visible and accessible	Exposure to parking and roadway may be overwhelming to residents and other users
	Positive use of space	
	Pleasant image to front of facility	
	Provides residents with places to walk	
This space acts as the core of a building complex that is normally visible upon entering a hospital. This space contains natural feature that provide various types of sensory relief.	Semi-private and secure	Fishbowl experience
	Easily visible and accessible	Privacy of adjacent rooms may be at risk when people are using the space.
	Shielded from wind	
	human scale	
These spaces are furnished for outdoor use and predominantly hard-surfaced. They might include natural elements such as trees, shrubs, or planters, but the space feels more like a paved urban plaza.	Low plant maintenance	May not have therapeutic qualities such as greenery and color.
	Small space designed for heavy use	May resemble shopping mall rather than peaceful passive space
	Persons with disabilities can move easily through the space	
An area that is an accessible outdoor area that is a long narrow balcony. Amenities for this space includes plantings, various seating types, and positioning of seating.	This space makes use of space that usually goes unused.	Weather and climate may play a great factor in when the space can be used. Additionally, microclimate may be an issue as well
	There is a potential for great views	
Area on top of a hospital building that is designed for the use of patients, staff and visitors. Sometimes can be viewed from hospital units and offices	Makes use of space that goes unused	Full exposure to climate and other factors
	Private and uncommon for public use	Temperature may be uncomfortable for users due to heights of adjacent buildings
	Potential for expansive views	
This can be either an outdoor or indoor garden that is specifically designated as a healing garden and designed with the appropriate amenities and plant types	Disruptive activities will not be found in this space	Self-conscious feeling by users of space
	Thought given to therapeutic qualities	If garden is not specifically designated as such, the function may be confusing.
Small quiet enclosed space that specifically labeled with a plaque or some form of signage by the administration or designer	Quiet and contemplative space	Often, only 1 person uses space at a time
	This space has specific activities	Self-conscious feeling by users of space
This type of garden cannot be entered but only viewed from inside the building. These are normally enclosed in small spaces and are less costly than other types of gardens	Green space contained in small area	Greenery can't be viewed or experienced up close, walked through, or heard. Frustrating to 'Look but not Touch'
	Viewed from indoor seating area	
	Low maintenance costs	
Similar to a viewing garden, this typology is a smaller garden that is able to be looked at from the indoor seating area. There is also the option for residents to walk into the garden and sit, but only a few people at a time.	Green outlook for waiting people	Users may get the feeling of being too enclosed or inside of a "fishbowl"
	Very quiet sitting place	
	Lack of use will not invade privacy of adjacent rooms and offices	
This space is used for parking, or utility placement including air conditioning units or dumpsters, etc.	Keeping utilities in same area can save room for other amenities	Normally a larger space that is under utilized by pedestrians
	Access to all utilities is advantage	Uninviting, can be odor filled

Table 4.1 | Adapted Typologies (by author)
(These typologies have been adapted from Marcus and Barnes, 1999)

Facility Design

Healthy Behavior Goals

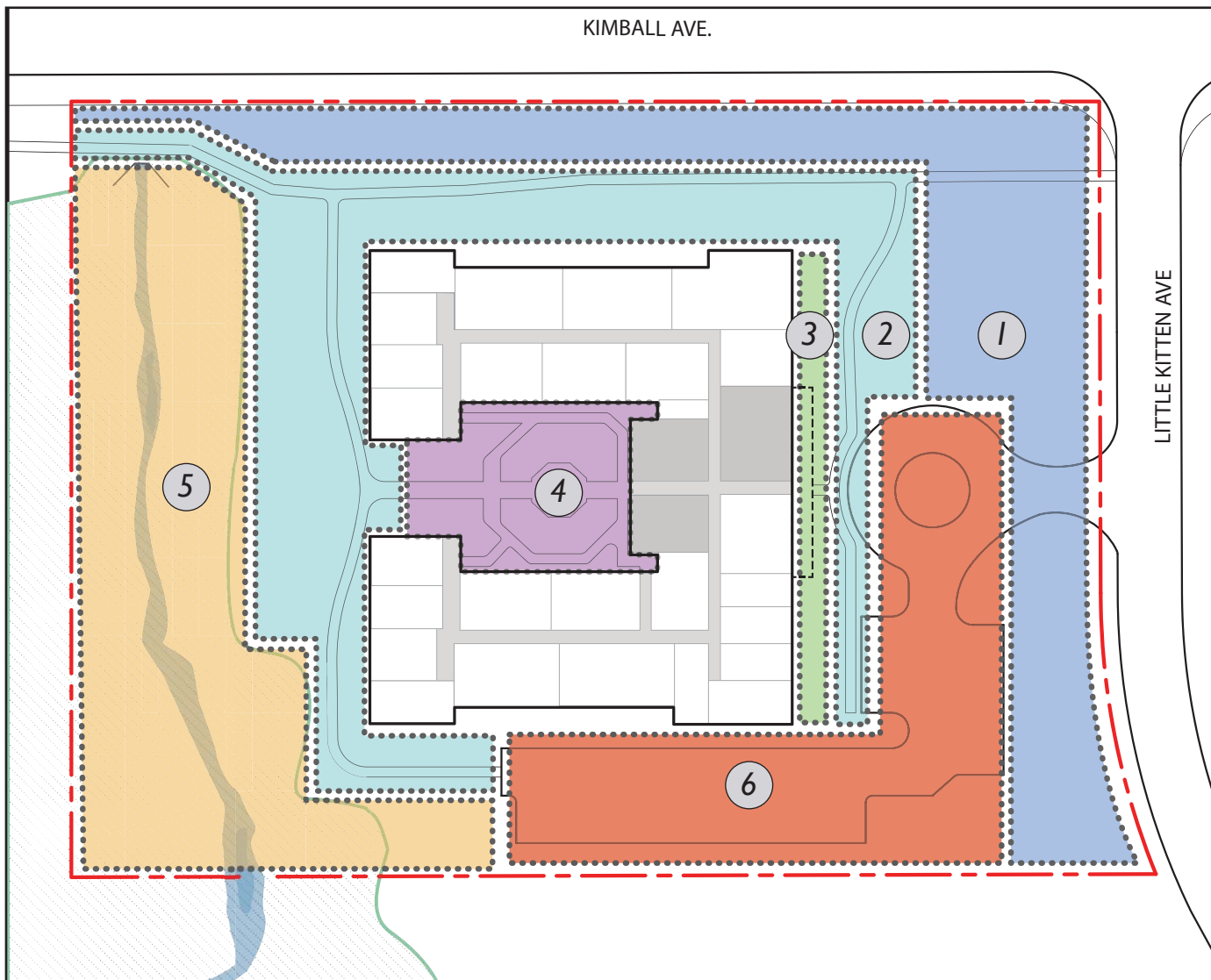


Figure 4.34 | Existing Typologies (by author)

This diagram shows how the existing facility is broken down into the 6 different typologies as listed below.

Existing Typologies

- 1. LANDSCAPE BUFFER
- 2. LANDSCAPE GROUND
- 3. FRONT PORCH
- 4. COURTYARD
- 5. SURROUNDING NATURE
- 6. UTILITY SPACE

➤ Target Users and Illness

Principles

Design principles that assist in making gardens successful include:

Variety- By providing residents with a variety of active or passive spaces, they have more control over the environment they want to be a part of.

Green Material: Hardscape should be minimized to about a third of the site to make residents feel an improved sense of wellness.

Encourage Exercise: By encouraging people to meander through gardens or be active in an outdoor environment, the mental state of each resident could be improved.

Natural Distractions: Natural elements such as plants, water, and flowers have been proven to lower stress levels in those who have contact with them.

Limit Encroachment: Eliminating outside noise and artificial light and replacing them with natural light and sounds lets residents focus on the space and the intended sensory experience.

Minimize Ambiguity: For residents who suffer from illnesses, high levels of mystery when it comes to design can add stress to garden users. Making spaces easy to navigate and removing abstractions can help maximize the positive outcomes wanted from a garden.

Adapted from Marcus and Barnes (1999); Larson and Kreitzer (2007)

By applying these guidelines to the design of a garden, stress and depression can be alleviated and wellness can be improved. Additionally, limiting the distracting elements surrounding the garden makes the user's experience more meaningful. With these over-arching principles in mind, goals for the design outcome can be created.

Behavior

The criteria that was used to influence the behavior aspect of the literature review came from the focus group interview findings, namely, the three common chronic illnesses; dementia, stroke paralysis, and Parkinson's disease. Macular degeneration was also a focus in the behavior section of the literature review due to its prevalence among seniors age 55 and older. These common chronic illnesses can be broken down into three categories; Ambulatory, Cognitive, and Visual. The following ailment synthesis can be seen in table 4.2.

Ambulatory Ability

Stroke Paralysis

Paralysis from stroke is the inability to move a muscle voluntarily. Paralysis of some sort is common after someone experiences a stroke. Rehabilitation and therapy can help regain movement. Nearly 700,000 people in the United States suffer a stroke annually and is the third leading cause of death in the US. The leading cause of death for people who have had stroke are either recurrent strokes, or cardiac disease. The number of people who have had a stroke is projected to increase due to the growing senior citizen population, and the rise of obesity, diabetes, and inactivity levels (Gordon et al., 2004).

Cures/Medication

Recommendations for battling recurrent strokes are to make lifestyle changes and pharmacological therapy interventions. Lifestyle factors that could change include hypertension, diet, cigarette smoking, and physical inactivity. Physical rehabilitation for stroke survivors used to end after a few months post stroke because it was believed that most motor skills would resurface by then, but studies have shown that continued rehabilitation can increase aerobic capacity and motor function (Gordon et al., 2004).

Focus Group Results		Literature Analysis Results	
Disability		Recommendation	Explanation
Cognitive Ability	Dementia	Accessibility to outdoor spaces and path design	Easy access to gardens and minimal door thresholds
			well defined paths and free-flowing looped designs
			well maintained paths within garden to avoid trip hazards
			handrails for garden paths and areas for seating
			Appropriate lighting for paths to ensure security
		Perimeter Fences	Highlight change in heights by using different colors
		Green Material	Boundaries to avoid accidentally leaving outdoor area
			Plants should provide various sensory stimulation
			Plants should allow for touching and feeling
			Plants should relate to a person's memory or experiences
Large section of same plant color rather than one big plant			
Warm colors are easier to see than cool colored plants			
Ambulatory Ability	Parkinsons	Exercise	Exercise can improve physical capacity
			Reduce Stiffness
		Physical therapy	Improve Balance
			Improve posture
	Stroke paralysis	Physical therapy	Prevent complications due to prolonged inactivity
			Decrease recurrent strokes
		Increase aerobic fitness	
Vision Loss	Macular Degeneration	Site Amenities	Seating and handrails should be at standard heights
			Lighting can be adjustable depending on the user
		Create Multi-dimensional Sensory Experience	Acoustic Elements can be used to define space
			Using fragrant elements such as flowers
			Use edible plants in garden spaces
		Hazard Warnings	Use contrasting colors to identify surface level changes
			Limit protruding objects
Indicate change in material			

Table 4.2 | Common Chronic Illness Findings (by author)

This diagram shows how the existing facility is broken down into the 6 different typologies as listed below.

Literature Analysis Results	
General Amenities and Strategies	Recommended activities
Lighting	Walking
Easy Navigation	
Maintainence	
handrails	Gardening
Seating	
Contrasting colors	
Lock	N/A
Edible plants	Gardening
Flowers	
Grasses	
Trees	Meditating
Outdoor activity spaces	Walking
Handrails	dancing
Open Space	Yoga
Wide Pathways	Tai Chi
water exercises	Stepping over obstacles
Active Space	Marching/Big arm swings
Seating	Sports
	Gardening
Seating	Gardening
Auditory Elements	Meditating
	Walking
Lighting	Sitting
Seating	
Plants/trees	Walking with Staff
Birds	
Water Fountain	
Detectable Surfaces	Meditating
Contrasting Colors	
Handrails	

Goals and Recommendations:

1. Preventing complications of prolonged inactivity

- Exposure to orthostatic or gravitational stress (intermittent sitting and standing)
- Walking or remedial gait retraining

2. Decreasing recurrent stroke and cardiovascular events in stroke patients

- Reduction of risk factors
- Aerobic conditioning program
- Dieting

3. Increase aerobic fitness

- Leisure-time physical activity

Parkinson's

Parkinson's disease affects the nervous system, affecting people's mobility including posture, transfers, balance, and walking. The disease leads to fear of falling, inactivity, social isolation, or risk of osteoporosis. Parkinson's disease is a progressive disorder, meaning that as time goes on, it is likely the condition will worsen. Though there is currently no cure for the disease, certain medications, and sometimes surgery, could help improve symptoms of the illness. Another recommendation is the implementation of physical therapy and active and passive exercise, with the goal being to improve balance and range of motion. Another outcome of exercising is improved physical capacity (Keus et. al., 2007; Mayo Clinic Staff, 2016).

Cognitive Ability

Dementia

Dementia, caused by damage to brain cells which interferes with the cells ability to interact with one another, is a broad term used to describe a person's state of

declining cognitive ability, from memory to thinking. The two most common types of dementia include Alzheimer's disease and vascular dementia, which sometimes occurs after a stroke. Symptoms of dementia vary from person to person, but normally include 2 of the following indicators; memory loss, communication or language deficit, ability to focus, judgment, or visual perception. This illness is progressive, with symptoms gradually getting worse over time. As dementia patients are declining in mental state, they require more specialized assistance, making them ineligible for some assisted living facilities. Homestead houses residents with early stages of dementia.

Vision Impairment

Macular Degeneration

Macular degeneration is an incurable eye disease that is the leading cause of vision loss. The center of the retina, the macula, affects the central vision of the eye controlling our ability to read, drive, recognize faces, or see detail in objects. This disease causes the deterioration of the macula, causing the loss of a person's central vision. This disease is most prevalent in people age 55 and older. As age increases, so does the risk of developing this disease. There are three stages of age related macular degeneration (AMD): early AMD, where people don't experience vision loss; intermediate AMD, where people might experience vision loss, but most symptoms may not be noticeable; and late AMD, where people will notice a loss in vision.

Age related macular degeneration could be caused by both hereditary and environmental factors, yet an exact cause of the disease is unknown. Other risk factors for macular degeneration, aside from a family history of age related macular degeneration, are race and smoking. Caucasians are more likely to develop the disease than African-Americans and Hispanics. People who smoke are twice as likely to develop AMD. There are no medications that can cure this disease, but there are ways to reduce the risk of developing macular degeneration including dieting, exercising, and not smoking. Citizens

are recommended to walk at least a half hour a day, or participate in more strenuous activities like yoga, aerobic activities, or sports. When spending time outdoors, citizens are cautioned to wear hats or sunglasses to protect your eyes from harmful UV and blue light (American Macular Degeneration Foundation, 2016).

Vision Impairment Recommendations

While many resources have been expended on re-searching ambulatory disabilities, not many resources have been spent on the visually impaired. The concept of designing for all people ranging in ability is called Universal Design. There are three categories that recommendations fall into: site amenities, creating a multi-dimensional experience, and hazard warnings. According to the World Blind Union, there are eight site considerations that come into play when designing for the visually impaired, but for this study, the following 5 will be used and fall into the preceding categories:

1. **Site Amenities**
 - a. Lighting
2. **Create a Multi-Dimensional Experience**
 - a. Acoustics
3. **Hazard Warning**
 - a. Color Contrast
 - b. Limit Protruding objects
 - c. Detectable warning surfaces

Lighting

Providing lighting within spaces allows users to experience a space for a greater period of time throughout the day. When using lighting within a space, recommendations are to avoid glare and reflection by limiting the amount of glossy surfaces, limiting shadows by placing light sources appropriately, distributing light levels evenly, and lastly, allowing light levels to change depending on the preference of the user by using a dimmer switch.

Acoustics

Acoustic elements include but are not limited to moving water, wind chimes, crickets or birds, and different forms of vegetation. By using these acoustic elements, users are provided a different sensory experience allowing them to focus on the space. Furthermore, using acoustic element can also help those dealing with visual impairments to define spaces.

Color Contrast

Color contrast can be used as a means of hazard detection, by drawing attention to signage, defining different routes, define spaces or use, or even to detect level changes. Site specific recommendations are to contrast handrails with the surroundings walls, contrast furniture with the color of the ground plane, and have a lighter ground plane color against a darker perimeter. Lastly, using color pallets that are simple is encouraged to help avoid confusion.

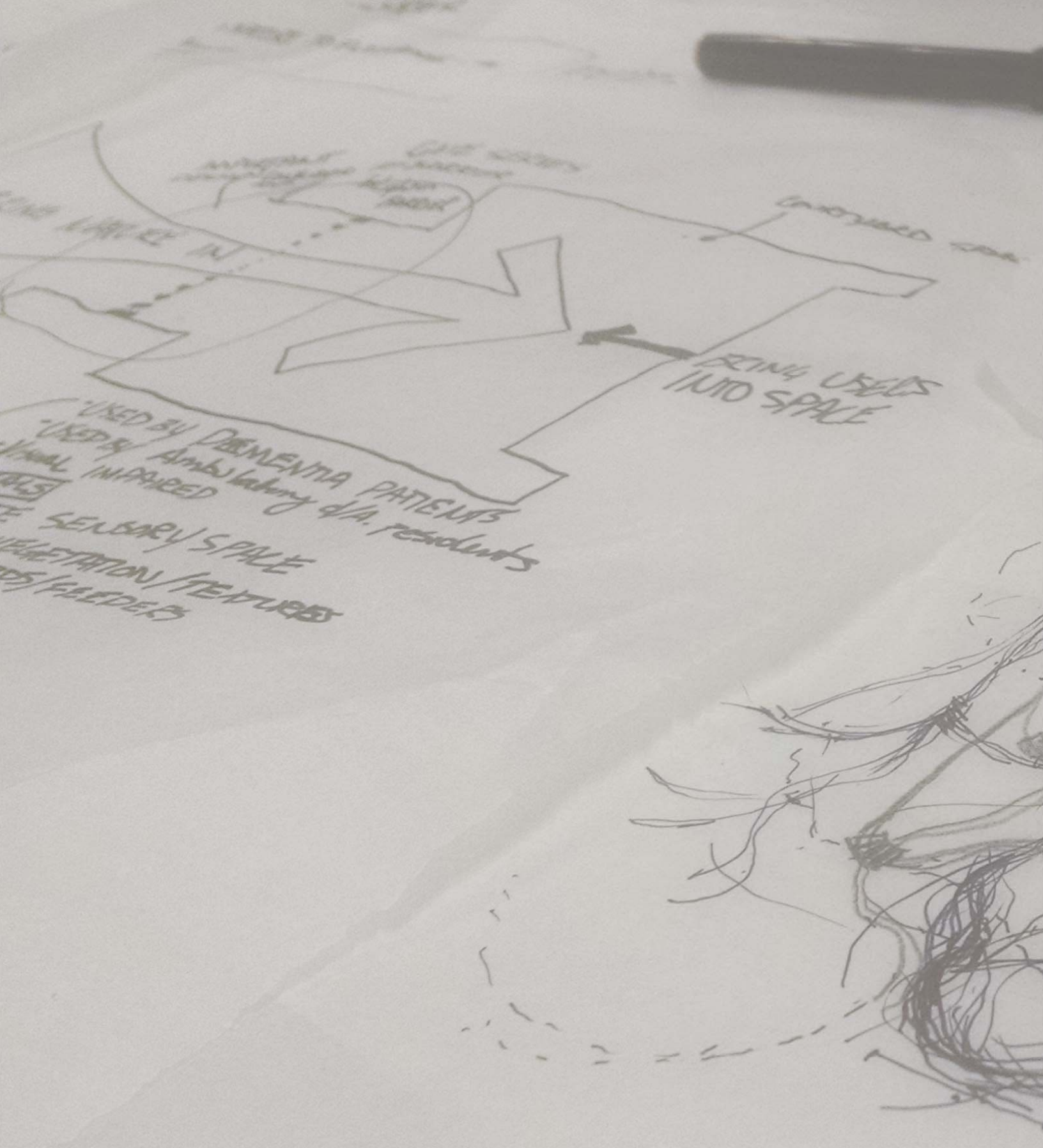
Protruding Objects

Possible protruding objects can include but are not limited to signs, canopies, over hanging branches, or even walls or the seating surface overhang of a seat wall. Recommendation for avoiding impact between the visually impaired and these objects are to 1) ensure that the overhanging elements are not low enough that they come into contact with pedestrian walking routes, 2) guide users with handrails, and 3) avoid placing objects within the walkways.

Detectable warning surfaces

Detectable warning surfaces provide a change in material under foot to notify the users that there is a change coming whether it is in ground surface type, a raise or depression in a surface, or if there is another form of obstruction in the walking path. This surface is used in similar situations as the color contrasting principles and can sometime be interchanged.

(Adapted from World Blind Union, 2016)



5. Design Solutions

Linking Findings and Objectives

The focus group interview was used as a means of solving the research hypotheses. The following section ties the answers of the focus group questions, along with the findings from the environmental audit, to the respective objectives.

Objective 1.1

Identify if the lack of information, spatial readability and familiarity of the existing green open spaces limits the uses of the residents.

Findings and Analyses (Q1, Q2)

The focus group analysis findings concluded that three of the seven residents said they do not use the green outdoor open space because of their fear of tripping, and their inability to distinguish trip hazards. This is the same reason residents do not use the other outdoor spaces. The environmental audit findings supported the fact that the courtyard space is used the most often because the findings showed that space was the most navigable and accessible for residents living within the facility.

Objective 1.2

Identify whether the lack of physical activity resources acts as a barrier that limits different uses by the residents.

Findings and Analyses (Q2, Q3)

The largest barrier that limits outdoor physical activity (as mentioned by the focus group participants) was the low site walls within the courtyard space. Participants did, however, state that they would like more variety of spaces to do different activities, either gardening, or even social spaces. There was even mention of adding a pool that could be used for physical therapy or exercise.

Objective 1.3

Identify which undesirable elements or if the absence of desired elements makes it difficult for residents to use outdoor spaces.

Findings and Analyses (Q2, Q3)

This hypothesis was most supported by the residents in the focus group interview. Aside from the presence of tripping hazards, another barrier that was mentioned in the focus group meeting was the lack of shade in summer. There was also talk about a lack of seating along the paths outside the facility boundaries, which was supported by the environmental audit. Only two spaces have seating elements, the courtyard space and the front porch. The courtyard space has a lot of seating available, but it is restricted to the center of the space.

Objective 2.1

Identify whether senior citizens who have better visibility to green open space are more willing to engage in physical activity than those who have worse visibility.

Findings and Analyses (Q1, Q4)

Three of the participants have rooms that have pleasant views of outdoor spaces. Of these three participants, two stated that they are encouraged to go outside when the weather is nice. The other participant said that he or she didn't use the outdoor space because an ailment that affected their physical ability. The other four participants have rooms that look over less attractive outdoor areas such as parking lots. For the most part, those participants do not use the outdoor spaces, aside from one participant who uses the courtyard space, but not the paths surrounding the facility.

Objective 2.2

Identify whether senior citizens who have better accessibility to green open space are more likely to engage in physical activity.

Findings and Analyses (Q1, Q2, Q5)

The courtyard space was stated as being the most used, with evidence from the environmental audit to support the fact that it's the most accessible space from the Homestead building. The focus group also stated that the courtyard spaced was sometimes used as a cut through space, going from residents' rooms to the dining hall and gathering spaces.

Objective 2.3

Identify how much senior citizen value green space accessibility regarding their health outcomes including physical activity.

Findings and Analyses (Q1)

Almost all the residents said that having access to the outdoor spaces was very important, no matter if they used the outdoor spaces for physical activity or not. One of the residents stated that they just like having the sunshine come into their window, while another said they like looking out at a bird feeder outside their room. Other participants stated that they like having access to the outdoor space for either their pets, or for when family members come to visit.

FOCUS GROUP QUESTIONS

QUESTION 1:
Outdoor Usage

QUESTION 2:
Barriers

QUESTION 3:
Amenities

QUESTION 4:
Views

QUESTION 5:
Physical Activity

GOALS AND OBJECTIVES

GOAL 1: ID. Barriers Limiting Use

Objective 1.1

Objective 1.2

Objective 1.3

GOAL 2: ID Access to Nature's Affect on Physical Activity

Objective 2.1

Objective 2.2

Objective 2.3

Figure 5.1 | Questions Linked with Objectives (by author)

This diagram shows how each question relates to a different objectives.

Synthesis of Findings

Objective 1.1:

Identify if the lack of information, spatial readability and familiarity of the existing green open spaces limits the residents' uses.

The environmental audit findings supported the fact that the courtyard space is used most because that space was the most navigable and accessible for residents living within the facility.

Objective 1.2:

Identify whether the lack of physical activity resources acts as a barrier that limits different uses by the residents.

The largest barrier that limits outdoor physical activity (as identified by the focus group participants) was the low site walls within the courtyard space. Participants did, however, state that they would like more variety of spaces to do different activities.

Objective 1.3:

Identify which undesirable elements or if the absence of desired elements makes it difficult for residents to use outdoor spaces.

A barrier that was mentioned in the focus group meeting was the lack of shade in summer. There was also talk about a lack of seating along the paths outside the facility boundaries, which was supported by the environmental audit. Only two spaces have seating elements, the courtyard space and the front porch.

FOCUS GROUP QUESTIONS

QUESTION 1:
Outdoor Usage

QUESTION 2:
Barriers

QUESTION 3:
Amenities

QUESTION 4:
Views

QUESTION 5:
Physical Activity

GOALS AND OBJECTIVES

GOAL 1: ID Barriers Limiting Use

Objective 1.1

Objective 1.2

Objective 1.3

GOAL 2: ID Access to Nature's Affect on Physical Activity

Objective 2.1

Objective 2.2

Objective 2.3

GOAL 1: Identify Barriers Limiting Use

These findings can be synthesized into the following three barriers:

1. Ease of Navigability
2. Site Furnishings
3. Variety of Spaces

Objective 2.1:

Identify whether senior citizens who have better visibility to green open space are more willing to engage in physical activity than those who have worse visibility..

2/3 residents with **pleasant views** stated that they are encouraged to go outside when the weather is nice, while just **1/4** residents with views overlooking the **parking lot** use the outdoor spaces.

Objective 2.2:

Identify whether senior citizens who have better accessibility to green open space are more likely to engage in physical activity.

The courtyard space was stated as being the most used, with evidence from the environmental audit to support the fact because it is the most accessible space from the Homestead building.

Objective 2.3:

Identify how much senior citizens value green space accessibility regarding their health outcomes including physical activity.

Almost all the residents said that having access to the outdoor spaces was very important, no matter if they used the outdoor spaces for physical activity or not. Residents like having sunshine in rooms, visual access to vegetation, and visual access to animals (birds, deer, etc.).

FOCUS GROUP QUESTIONS

QUESTION 1:
Outdoor Usage

QUESTION 2:
Barriers

QUESTION 3:
Amenities

QUESTION 4:
Views

QUESTION 5:
Physical Activity

GOALS AND OBJECTIVES

GOAL 1: ID Barriers Limiting Use

Objective 1.1

Objective 1.2

Objective 1.3

GOAL 2: ID Access to Nature's Affect on Physical Activity

Objective 2.1

Objective 2.2

Objective 2.3

Goal 2: Identify Access to Nature's Affect on Physical Activity

These findings pertaining to identifying access to nature's affect on physical activity can be synthesized into the following two statements:

1. Provide access (both visual and physical) from gathering spaces
2. Provide variety of spaces (both active and passive)

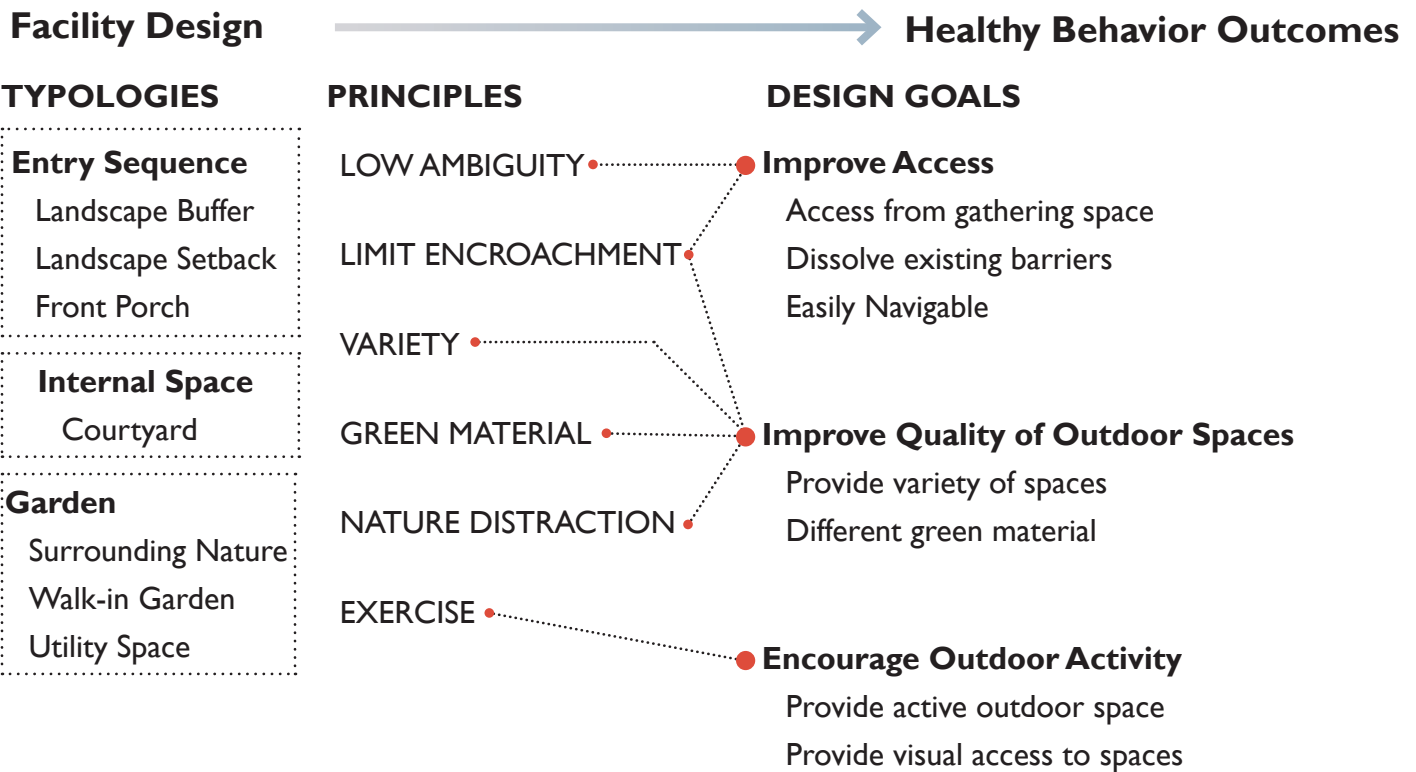


Figure 5.2 | Healthy Behavior Goals (by author)

Design Goals and Objectives

There are three design goals that stemmed from the research aims and hypotheses, and were refined after comparing this with the findings of the focus group results. These design goals include (1) Improve access to nature, (2) improve the quality of outdoor spaces, and (3) encourage outdoor activity. These three goals can be seen in figure 5.2 along with the corresponding objectives.

Focus Users

Once again, there are six landscape types: landscape buffer, landscape grounds, front porch, courtyard, surrounding nature, and the utility space. Of these six landscape types, only three of these space typologies are physically used by the residents on a regular basis, the courtyard space, the front porch, and the landscape grounds. Each

user has a different ability level, some with one of the three disabilities, cognitive, visual, or ambulatory. Figure 5.4 shows which spaces each resident uses.

The literature analysis findings, both the facility design portion and the behavior research, are combined together and applied to the site. The outcome is a list of general amenities for each of the space typologies based on which spaces are being used by the different user groups. Space 4 (Courtyard) has the potential to be physically used by all three user groups. Space 3 (front porch) is used by both the ambulatory and visually impaired residents. Space 2 (landscape grounds) and 6 (utility space) have potential to be physically used by the ambulatory users if circulation is improved but are primarily focused on as visual barriers from parking and Kimball Ave. These spaces and focus users can be seen in figures 5.3 and 5.4

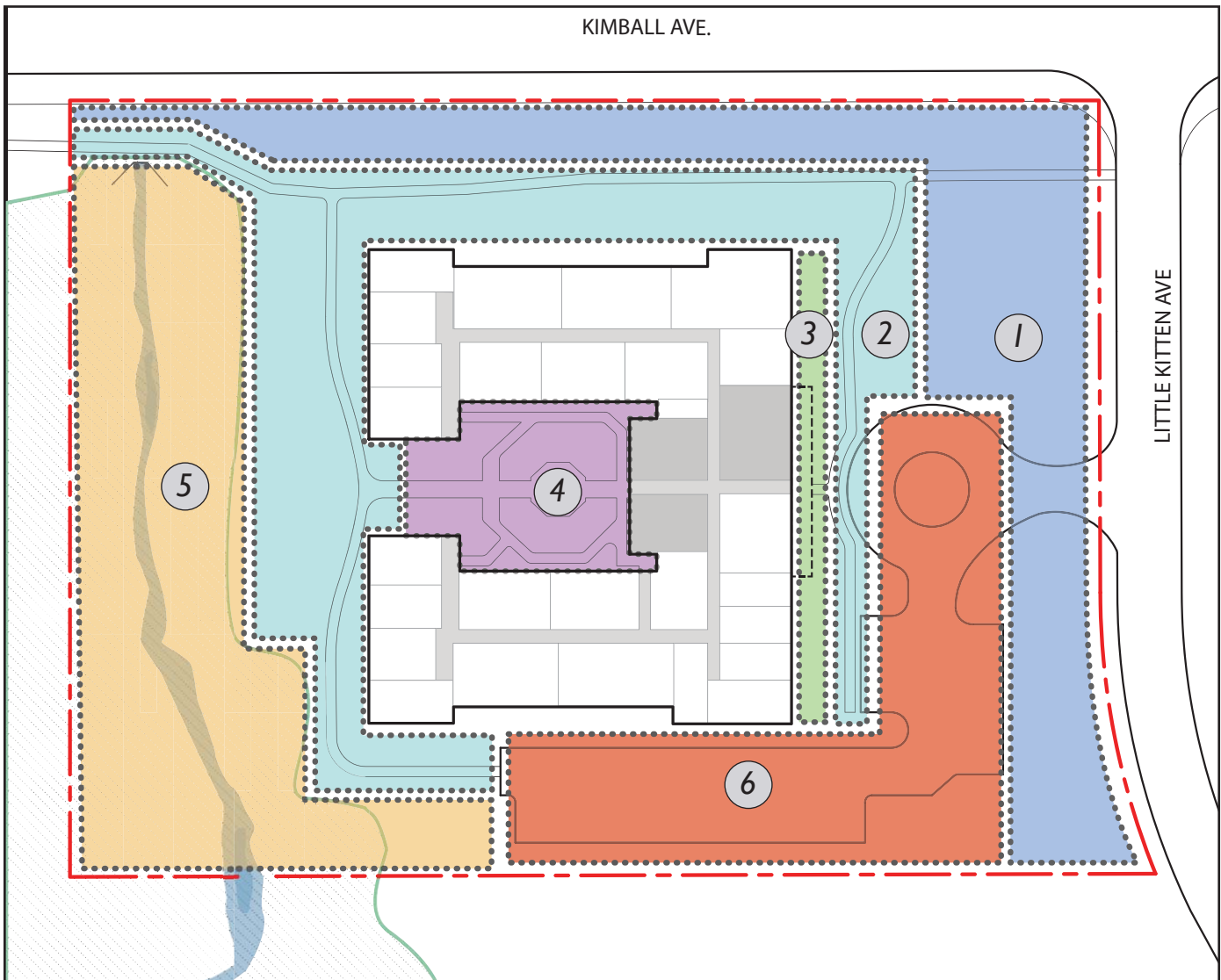
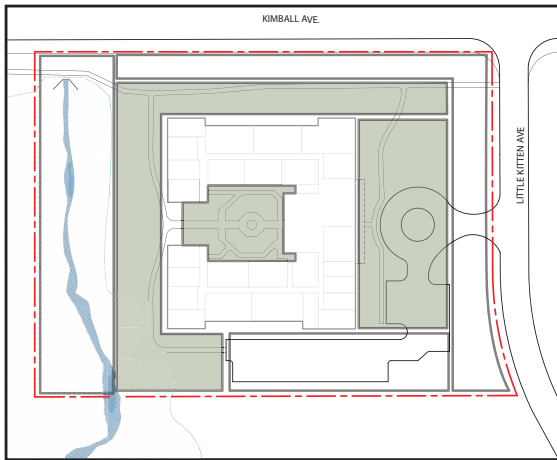


Figure 5.3 | Existing Typologies (by author)

This diagram shows how the existing facility is broken down into the 6 different typologies as listed below.

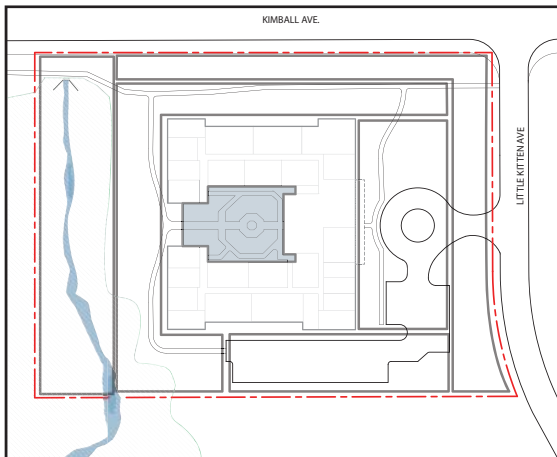
Existing Typologies

- 1. LANDSCAPE BUFFER
- 2. LANDSCAPE GROUND
- 3. FRONT PORCH
- 4. COURTYARD
- 5. SURROUNDING NATURE
- 6. UTILITY SPACE



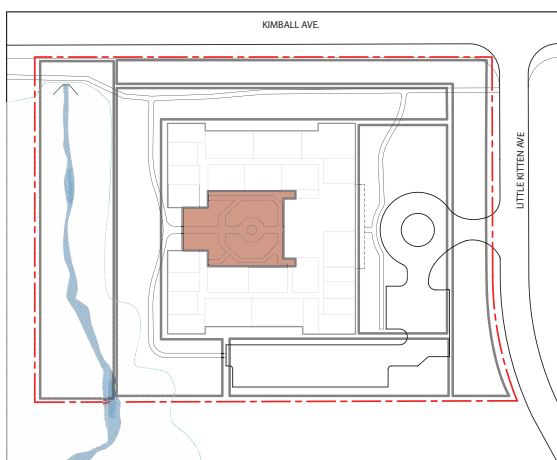
Ambulatory Users

- Courtyard
- Front Porch
- Landscape Setback



Visual Users

- Courtyard
- Front Porch



Cognitive Users

- Courtyard

Figure 5.4 | Spaces for Focus Group Users (by author)

This diagram shows which spaces are used by the different users with the ambulatory, cognitive, and visual impairments.

Key Concepts

There is a large, natural creek space located to the west of the facility. The key concept makes use of this natural space, bringing this natural element into the courtyard space towards the gathering spaces. The goal of this concept centers around design goal number one, improve access to nature. While the strategy for this goal is to provide access from gathering spaces, once within the courtyard, residents should be encouraged to progress from this space into the outdoor spaces surrounding the facility. The key concepts can be seen in figure 5.4.

The user maps on page 57 show that the courtyard space is used by all user groups, therefore design strategies focus on that primary space. The secondary space that is being focused on is the creek space, or the “Surrounding Nature” typology because it is directly connected to the courtyard space, and will be used to draw people into nature. The breakdown of the priority spaces can be seen in figure 5.5.

Outcomes and Recommendations

The literature analysis findings, both the facility design portion and the behavior research, are combined together and applied to the site. The outcome is a list of general amenities for each of the space typologies based on which spaces are being used by the different user groups. Space 1, that courtyard, has the potential to be physically used by all three user groups. Space 2 is the front porch, and is a space used by both the ambulatory and visually impaired residents. Space 3 and 4 have potential to be physically used by the ambulatory users, but are primarily focused on as visual barriers from parking and Kimball Ave. These findings were synthesized into table 5.1, seen on the following page.

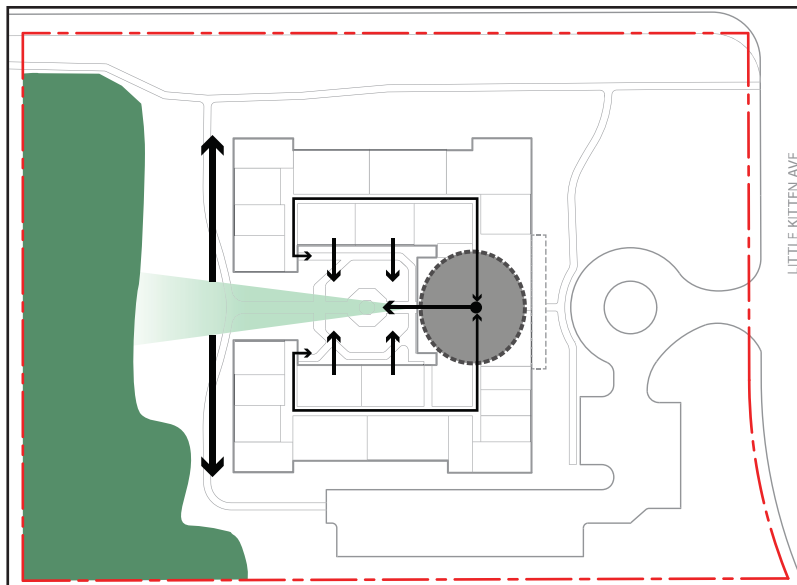


Figure 5.5 | Key Concept (by author)

- Natural Area
- Gathering Space
- Access
- Primary Access to Natural Area

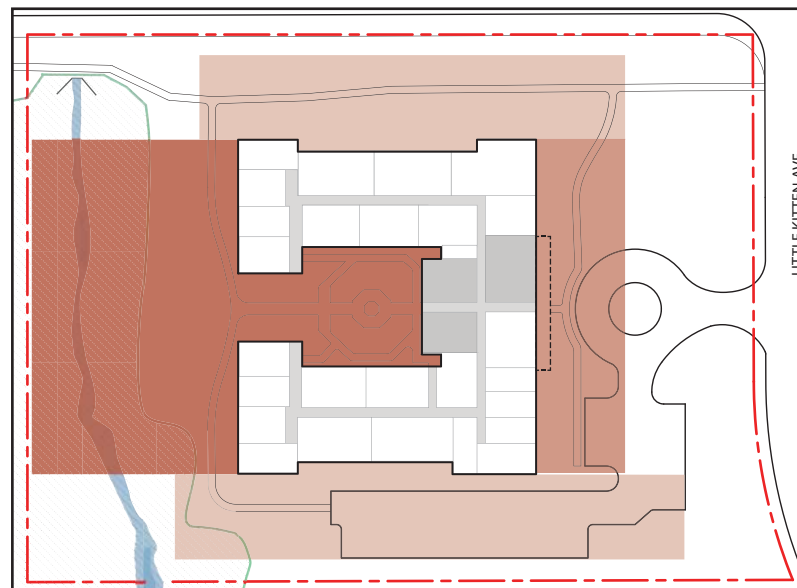


Figure 5.6 | Priority Spaces (by author)

- Physical Access (Primary)
- Visual Access (Secondary)
- Pass Through Space (Tertiary)

Health Outcome

HEALTH OUTCOMES AND RECOMMENDATIONS

Disability		Recommendation	Recommended activities
	Dementia	Accessibility to outdoor spaces and path design	Walking
			Gardening
		Perimeter Fences	N/A
		Green Material	Gardening
			Meditating
Ambulatory Ability	Parkinsons	Exercise	Walking
			dancing
			Yoga
			Tai Chi
	Physical therapy	Stepping over obstacles	
		Marching/Big arm swings	
		Sports	
Stroke paralysis	Physical therapy	Gardening	
		Meditating	
		Walking	
Vision Loss	Macular Degeneration	Site Amenities	Sitting
		Create Multi-dimensional Sensory Experience	Walking with Staff
		Hazard Warnings	Meditating

Table 5.1 | Health Outcomes and Recommendations (by author)

TYOLOGIES

Entry Sequence

- Landscape Buffer
- Landscape Setback
- Front Porch

Internal Space
Courtyard

Garden

- Surrounding Nature
- Walk-in Garden
- Utility Space

DESIGN ELEMENTS

Lighting
Easy Navigation
Maintainence
handrails
Seating
Contrasting colors
Lock
Edible plants
Flowers
Grasses
Trees
Outdoor activity spaces
Handrails
Open Space
Wide Pathways
water exercises
Active Space
Seating
Seating
Auditory Elements
Lighting
Seating
Plants/trees
Birds
Water Fountain
Detectable Surfaces
Contrasting Colors
Handrails

KIMBALL AVE.

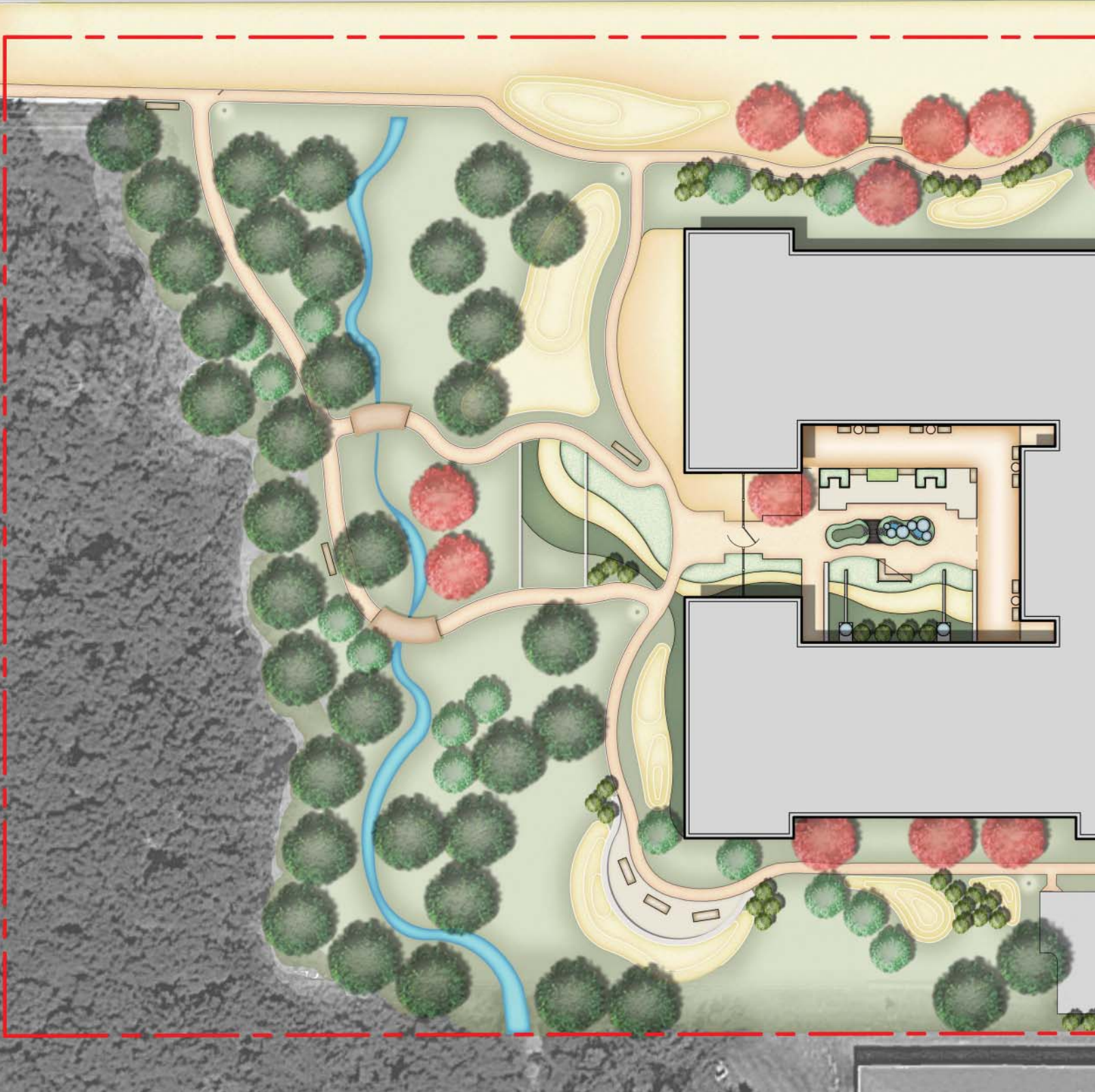


Figure 5.7 | Design Plan (by author)

This diagram shows how each question relates to a different hypothesis.



LEGEND

Amenities

- Seating
- Lighting Fixture
- Fountain
- Path
- Planter Box
- Water Catchment
- Homestead Sign

Vegetation Types

- Ornamental Tree
- Evergreen Tree
- Large Deciduous Tree
- Shrubs
- Manicured aesthetic
- Shade Tolerate/ ground-cover
- Native grasses
- Turf



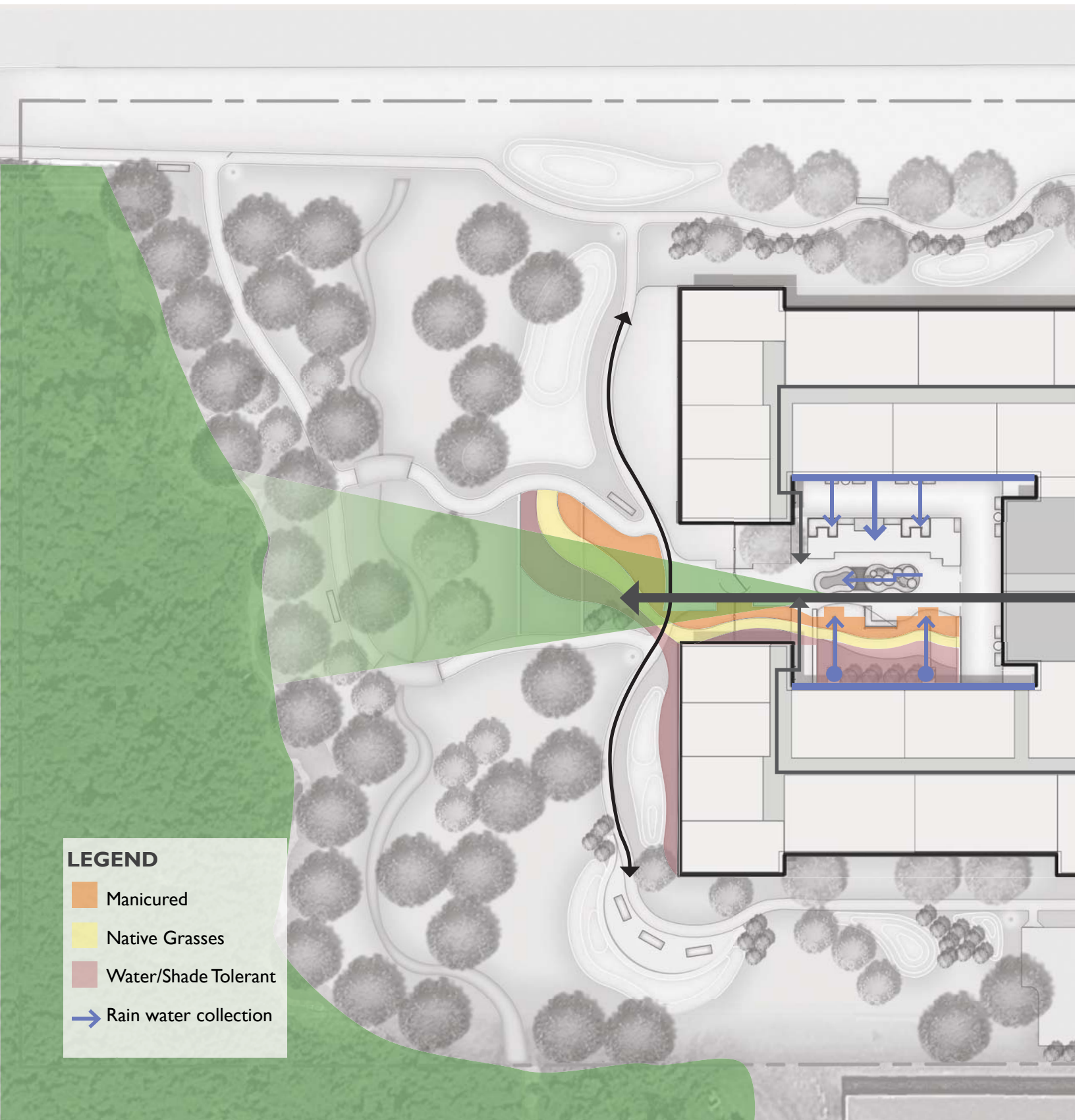
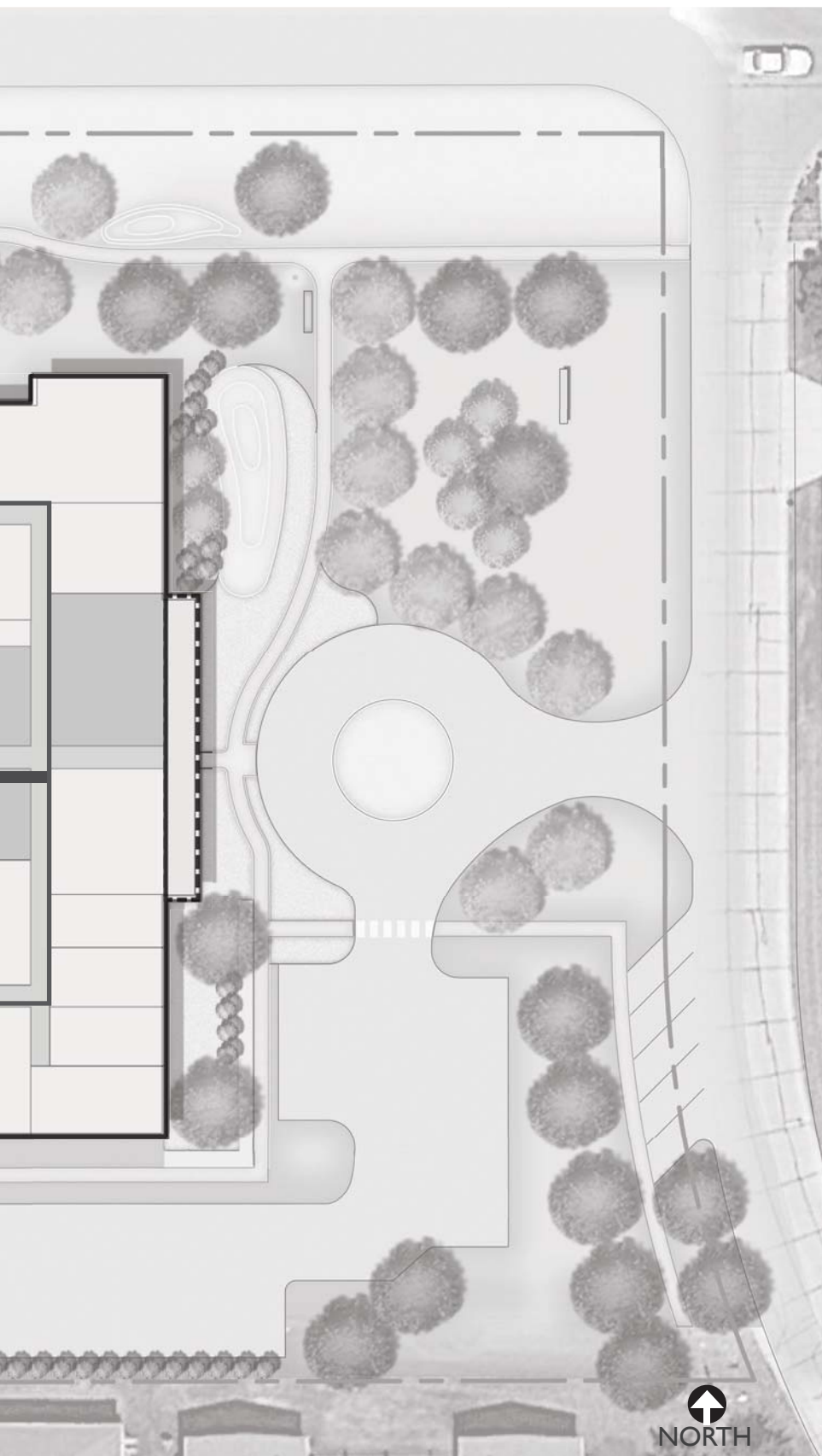


Figure 5.8 | Key Concept 2 (by author)

This diagram shows how each question relates to a different hypothesis.



Key Concepts and Goals

The key concept utilizes the existing surrounding nature to draw residents through the courtyard space. To reinforce this concept, water catchment system mimics this path, being captured along the edges of the building and moving towards the central axis of the space. Here, a fountain moves water through the system towards the creek.

Three different landscape types also reinforce the movement through the courtyard, transitioning from the indoor gathering space towards the creek space. The following goals and strategies were applied in this design:

1. Improve Access to Nature

Strategy 1: access from gather spaces

Strategy 2: Dissolve existing barriers

Strategy 3: Make paths Navigable

2. Improve the Quality of Outdoor Spaces

Strategy 1: provide green material

Strategy 2: provide variety of spaces

3. Encourage Outdoor Activity

Strategy 1: active outdoor space

Strategy 2: visual access to spaces

While the first two goals and strategies can be seen in figure 5.7, the third goal can be seen in figure 5.8 on the following page, where the active and passive spaces are delineated.

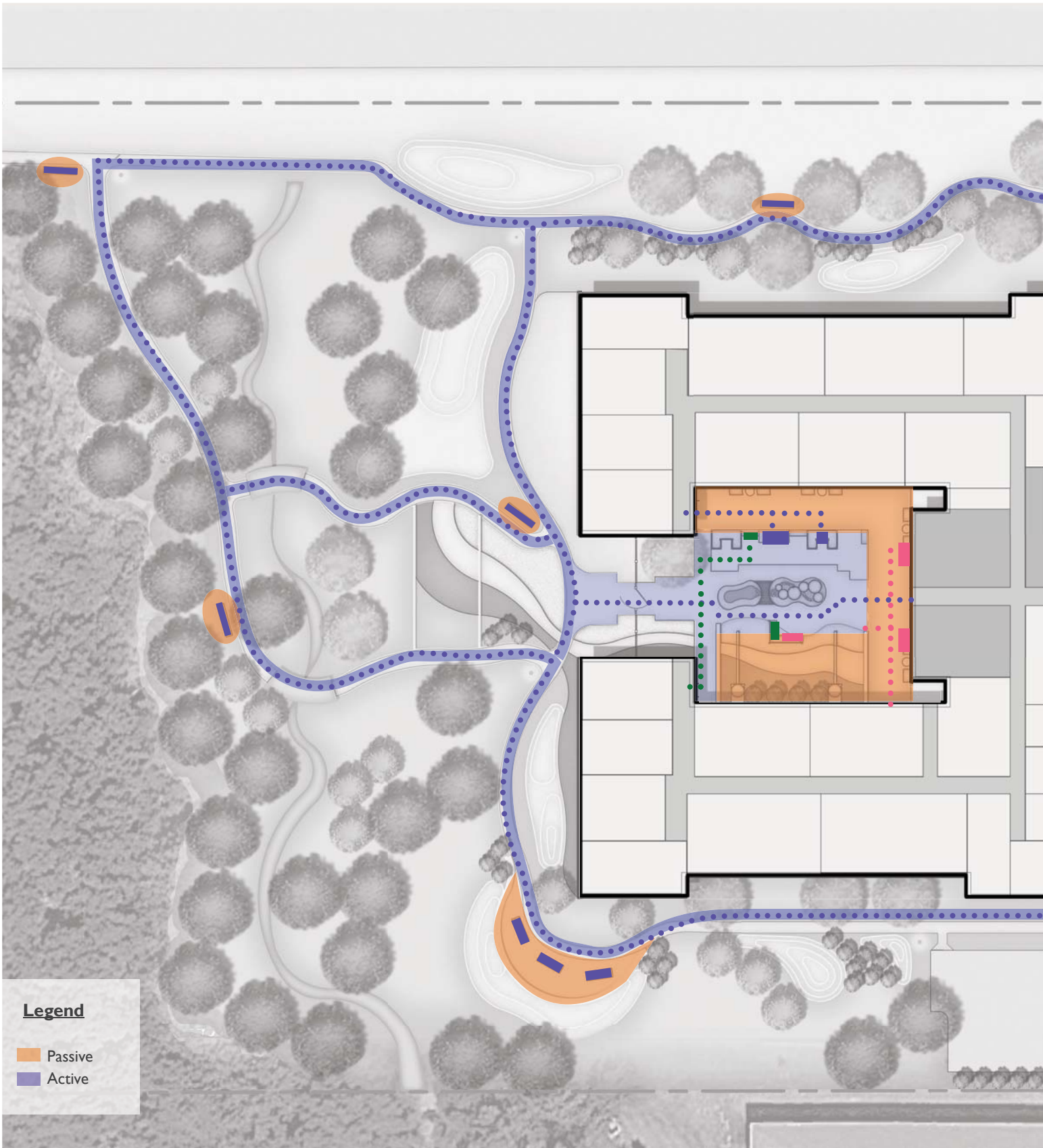
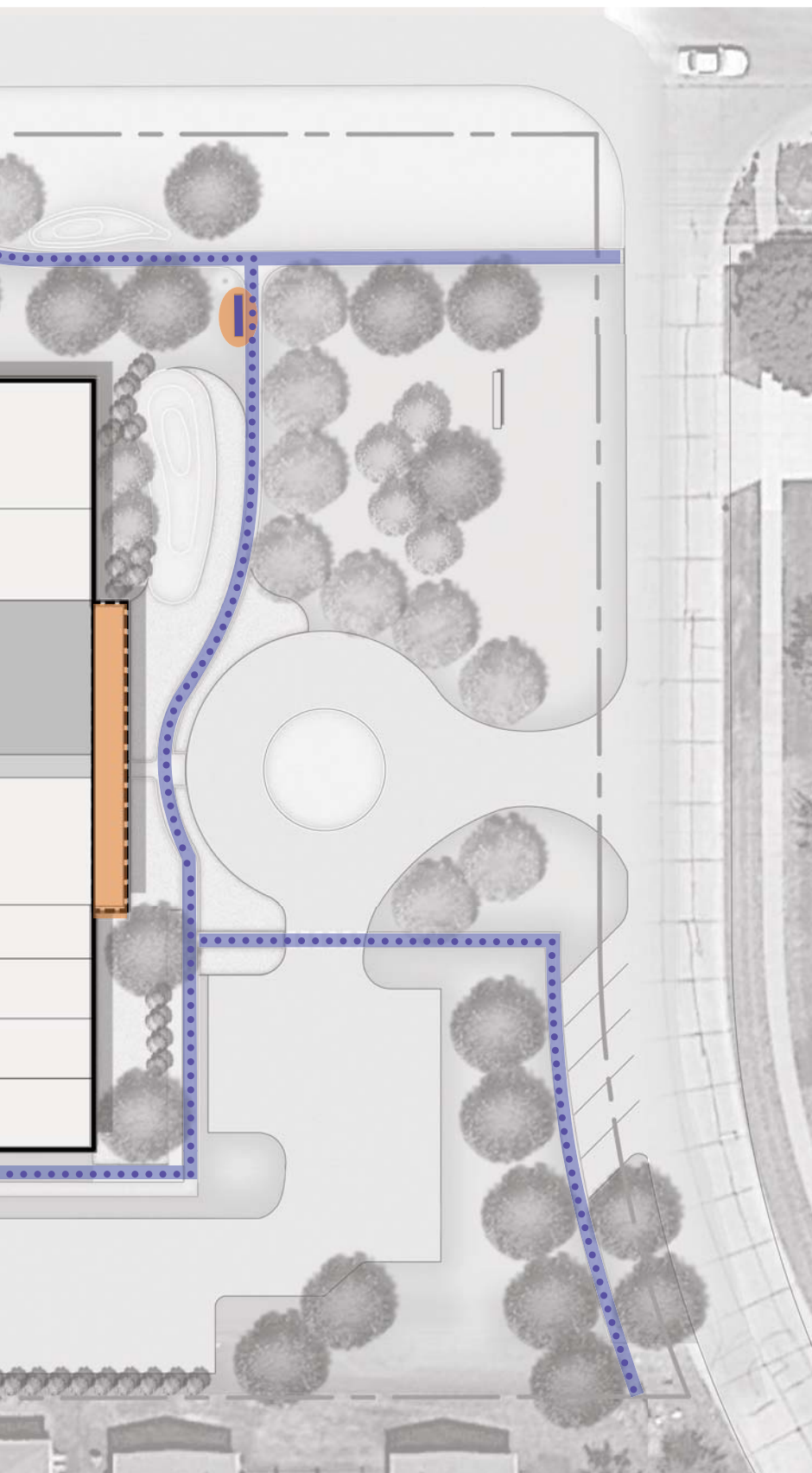


Figure 5.9 | User Profiles (by author)

This diagram shows which targeted health outcome resident uses each space.



This resident has macular degeneration but loves to experience the outdoor spaces, especially smelling the flowers, and feeling the sunshine on her skin. Every morning, she drinks her morning coffee and eats her breakfast under the trellis, listening to the fountains, and the wind blowing through the tall grasses.



A patient recovering from stroke paralysis uses the raised planter boxes to garden, an activity she hadn't been able to do for the longest time because she wasn't able to bend over or sit on the ground. Since these beds are now raised this resident can sit comfortably in her chair and reap the fruits of her labor.



A dementia patient sits and listens to running water of the fountain and smells the fragrant flowers, seeing a mix of grasses. This multi-sensory experience calms his feeling of anxiety.



A resident with Parkinson's has been walking around creek trail, at first, only being able to walk to the first bench along the route. Now, not only two weeks later, this resident has progressed to the point that they can complete the whole loop.

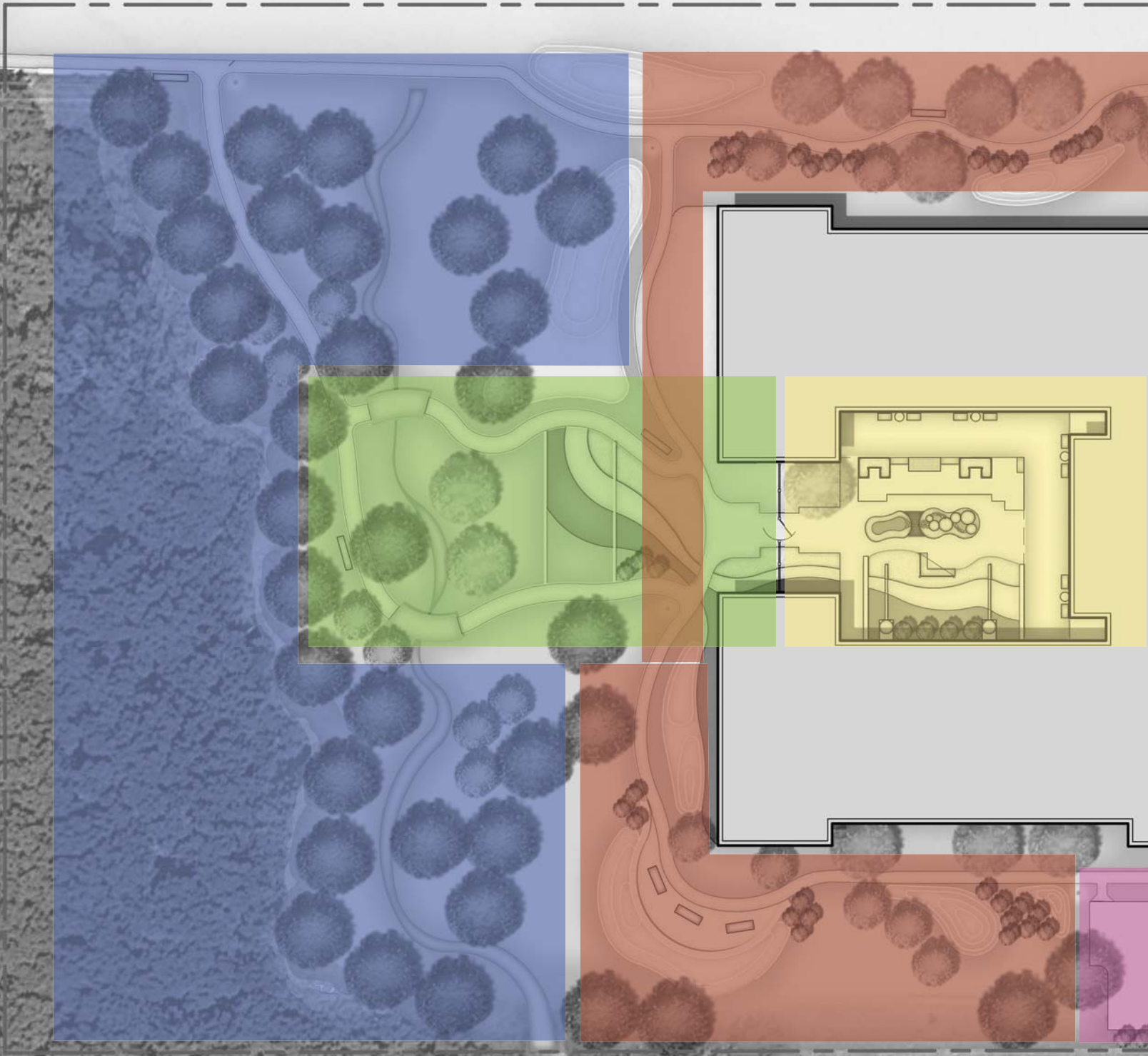
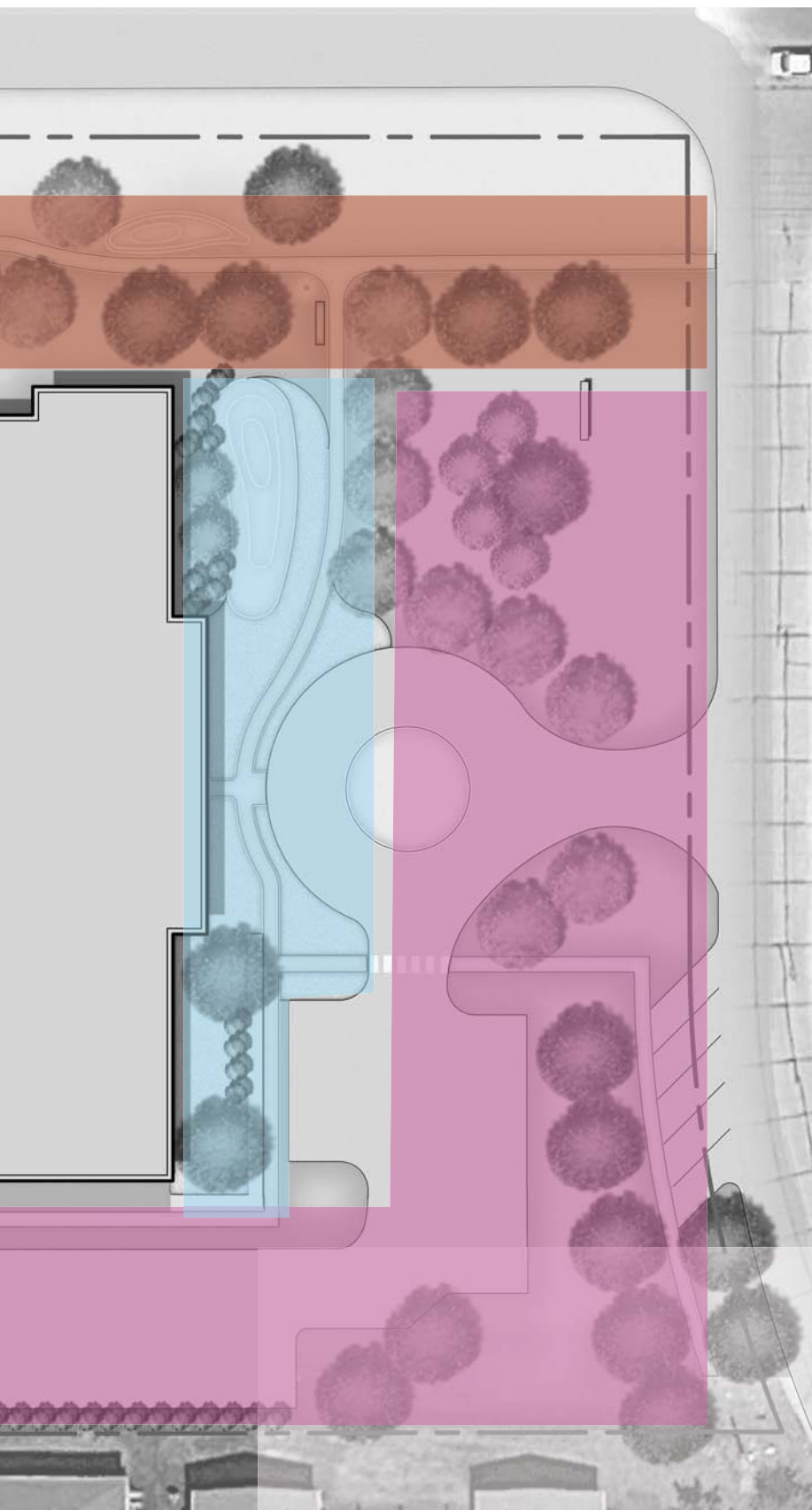


Figure 5.10 | Design Guidelines (by author)
This diagram shows how each question relates to a different hypothesis.



COURTYARD

- Enclosed
- Accommodate all users
- Allow shade and sunlight
- Active and passive

NATURE WALK

- Connects res. to surrounding nature
- Accessible loop-walkways
- Seating along route

SURROUNDING NATURE

LANDSCAPE GROUNDS

- Loops perimeter of facility
- Accessible paths
- Buffered from unattractive elements
- Some level of ambiguity

ENTRY SPACE

- Seating for pick-up
- Manicured look
- Accentuated approach

UTILITY SPACE

- Keep parking stalls
- Shield utilities from res. rooms
- Separate ped. and vehicular traffic



Space 1 | “Courtyard”

The courtyard space has the most amenities of all other spaces because it is accessed by the most users. The primary axis through the center of the courtyard is still intact, reinforced by the water feature. Seating elements are located around the site. A common barrier that was discovered by the focus group interview was the potential trip hazards in the form of low site walls. All surfaces are at a minimum height of 18” to account for those barriers. These spaces can be seen in Figure 5.10. The design of this space takes into consideration the three health behavior goals as seen below:

Access- standard heights for seating walls, easily navigable paths, transparent fence enclosure

Quality- Three different landscape types, three different spaces (planting garden, meditation space, covered seating area)

Activity- provide both active and passive space, no obstructions from window views



(A)



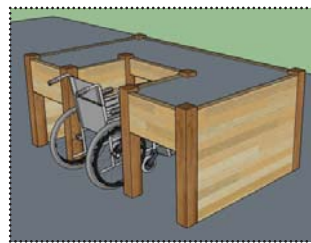
(B)



(C)



(D)



(E)



(F)

Figure 5.11 | Materiality (A-F)



Figure 5.12 | Section A-A: Courtyard (by author)

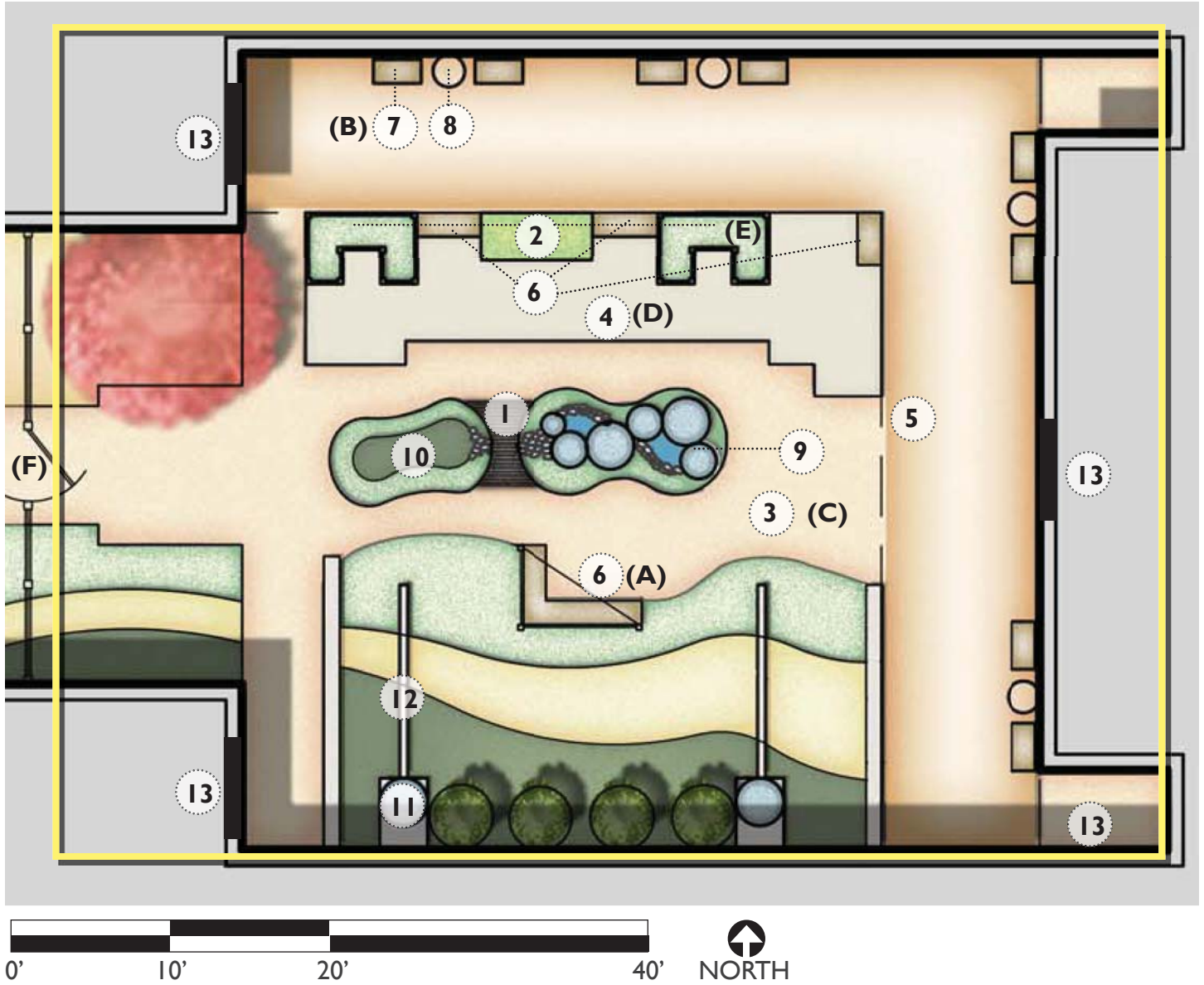


Figure 5.13 | Courtyard Blow-up Plan (by author)

- | | |
|-----------------------|---------------------|
| 1. BRIDGE | 8. TABLE |
| 2. PLANTERS | 9. FOUNTAIN |
| 3. PAVING PATTERN 1 | 10. OVERFLOW SPACE |
| 4. PAVING PATTERN 2 | 11. CATCHMENT BOWLS |
| 5. PERGOLA | 12. LEVEL SPREADER |
| 6. SEATING (VIEWING) | 13. ACCESS POINTS |
| 7. SEATING (LOUNGING) | |

Courtyard Space (Continued)

The design of the courtyard space offers both active and passive space, as well as different activities for residents to participate in. To distinguish the difference in these spaces, different paving patterns were used. Pathways that are used primarily for walking are warm colored, and where spaces are designated as passive, paving is cool colors.

Seating is placed so that they are oriented to some visual element, either fountain, raised planter bed, or vegetation. Most of the seating elements back up to a tall element, either a screen wall or taller vegetation so that residents feel a comforting sense of enclosure. While the placement of the seating element was heavily considered, the exact bench type was not as important. All seating elements should be wide enough for residents to sit in, and also provide arm rests for residents to use when getting up or sitting down.

The pergola has been placed so that it can act as a transition, encouraging residents to use the outdoor space. With this overhead covering, residents can sit and watch as others use the raised planter beds in the afternoon sun.

The site catches water in their gutter system, bringing it to the ground plane. Piping connects to the gutter and runs parallel to the trellis, emptying rainwater into the planter beds. On the south side of the courtyard, the gutter system collects water and empties into catchment bowls. Water is then carried along the level spreader into a landscape bed. Additionally, all paving within the courtyard is permeable so that all water is captured with the option to add an underground storm water catchment tank.



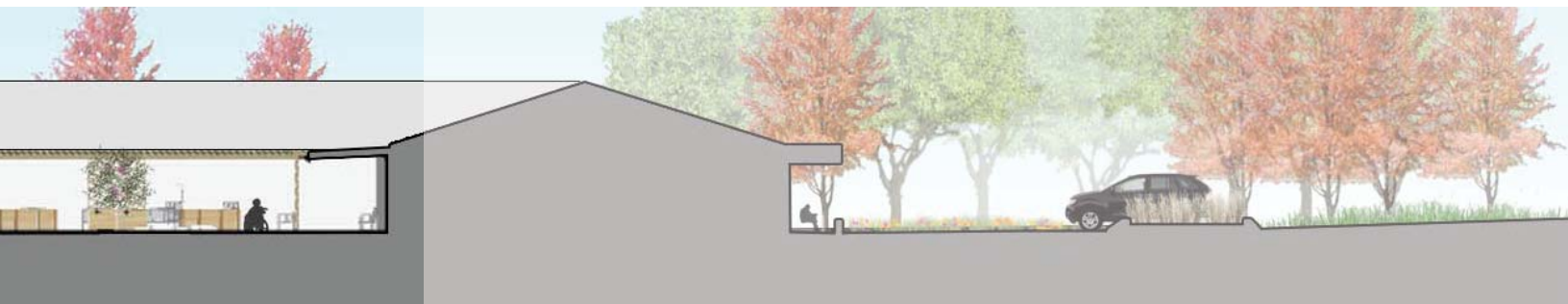
Figure 5.14 | Perspective Through Courtyard (by author)

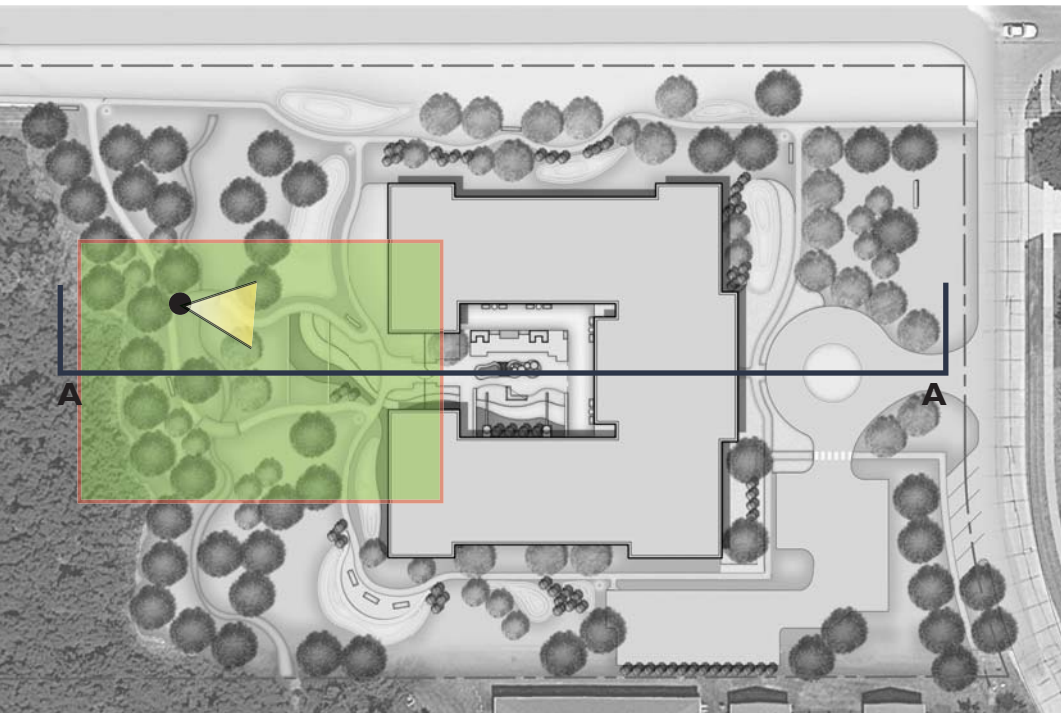
The fountain is made up of a series shallow bowls with water moving from taller to shorter bowls. Once the water flows from the shortest bowl, a small pond is supposed to catch the water. In the event of a larger storm, water moves under the bridge along a sheet of river rock and is collected in a rain garden planter bed. The area is surrounded by fountain grass, making the





water area less physically accessible to the resident for safety purposes. The tallest bowl sits at approximately 36 inches, so that residents using the space can see the water from seating areas. The water level within the bowls is shallow to attract birds to use the fountain.





Space 2 | “Nature Walk”

The nature walk typology is the space linking the social and gathering spaces to the natural environment. This space takes advantage of its surroundings by utilizing some of the “Surrounding Nature” typology space. The primary loop pathway is wide to account for all residents. Seating is available for residents who might need to stop and rest when utilizing the different paths.

Below are the ways that this design of the space follows the design goals:

Access- sidewalk provide access to “Surrounding Nature”; walkway path widths account for all users; paths are looped, making them easily navigable

Quality- provides active walking paths, while also providing seating; different levels of enclosure transitioning from enclosed to semi-enclosed to open moving from west to east; three different landscape types

Activity- pathways are inviting, using the existing creek as well as the planting swatches to draw users into space



Figure 5.15 | Section A-A: Nature Walk (by author)

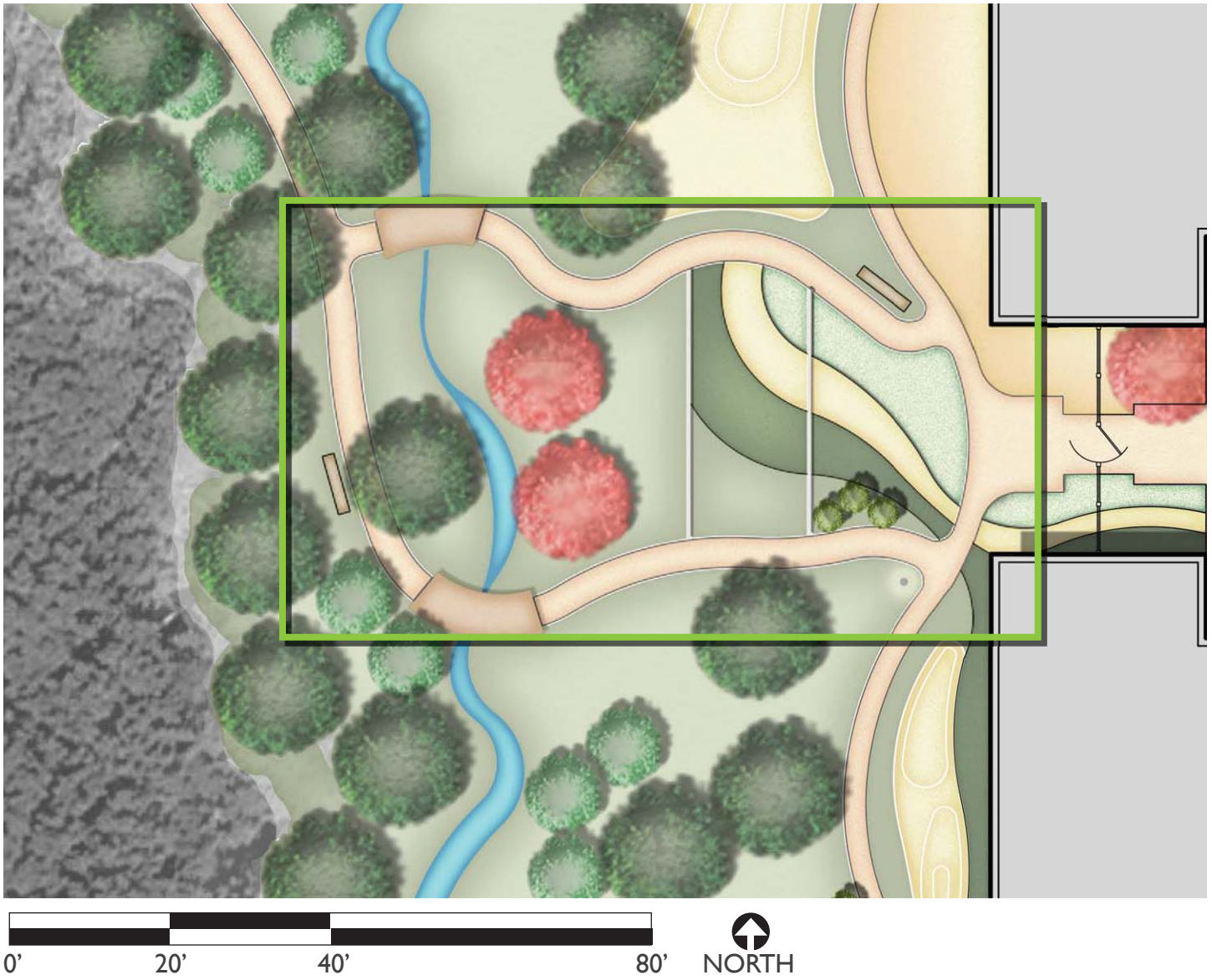


Figure 5.16 | Nature Walk Blow-up Plan (by author)

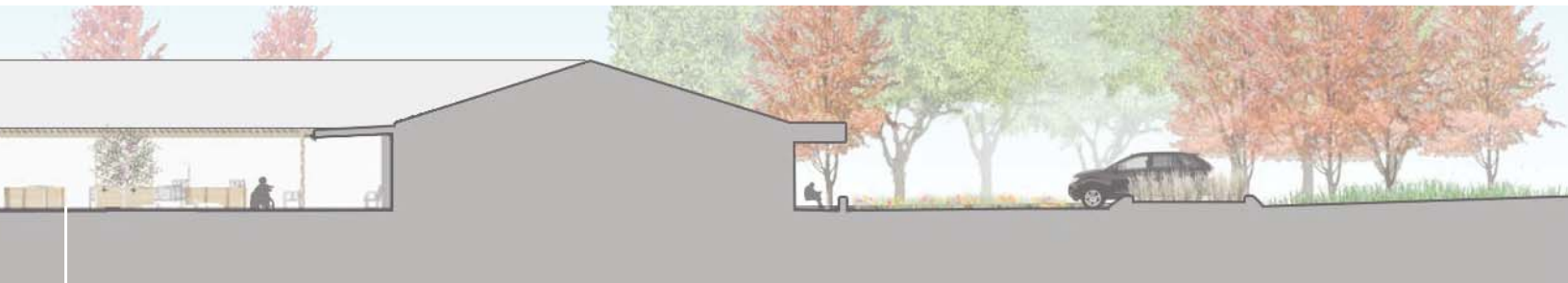




Figure 5.17 | View Through Nature Walk (by author)

Nature Walk (Continued)

The intent of the nature walk is to better connect the facility to the existing natural environment, or surrounding nature typology. Utilizing pathways that are wide enough for residents, access to this more natural space is enhanced. Along the pathways are areas for resting, sitting, and observing nature along the path. Seating elements mimic the seating located within the courtyard space, with armrests to use to get in and out of the chair.

Proposed pathways along the nature walk have handrails for residents who are in need of this apparatus. A bridge along this route was added to connect residents to the opposite side of the creek as well as a means to heighten the level of ambiguity and improve aesthetic quality.

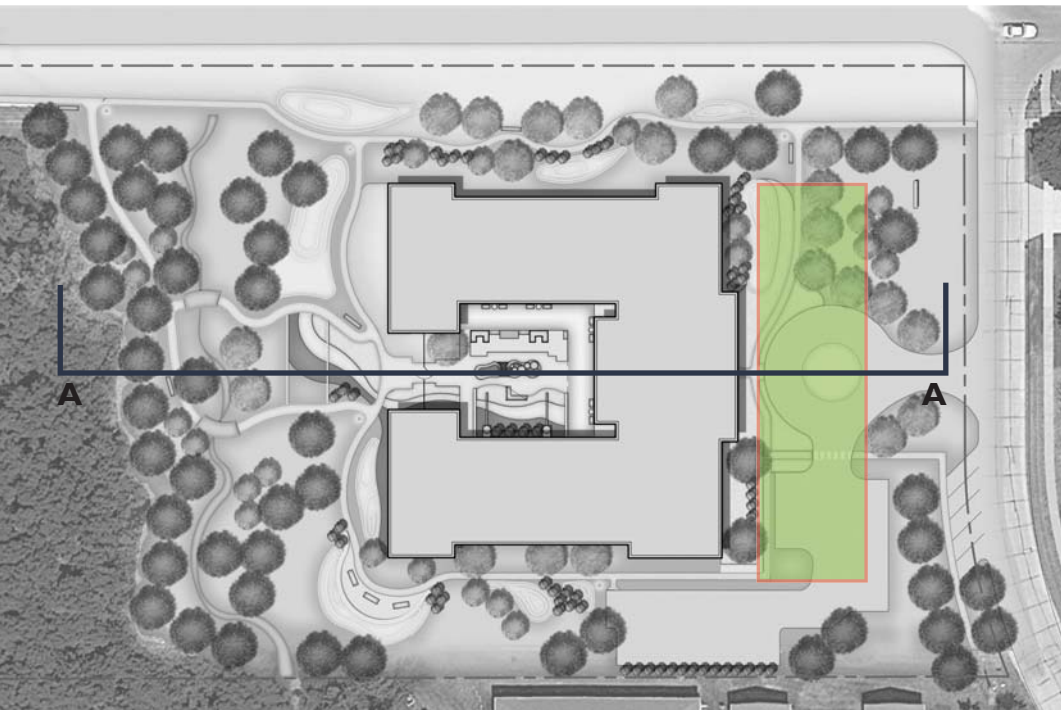
Along this pathway is a variety of plant material. Trees transition from ornamental to larger, mature trees as they move from east to west. Native tall grasses, rain





garden plants, shrubs, and flowers were used to add visual interest. Because of the variance in height and plant material, the users of the space will be more inclined to keep the users focused on the environment while they use the space. Because of the significant grade change, retaining walls are in place. The path leading west is sloped to account for this grade change as well.





Space 3 | “Entry Space”

The “Entry Space” is heavily manicured, focusing visitors of Homestead on the front of the facility. A native grass berm and a mix of trees and shrubs are used, not only as a way to draw users to the entrance, but also as a visual buffer for residential rooms along the front of the Homestead building.

Ornamental trees line the entrance to the facility to guide approaching visitors to the front of the building. A sidewalk has been added to bring visitors to the front entrance of the facility from the on-street parking stalls located along little Kitten Ave.

Along the south side of this entry space, the retaining wall and landscape area were kept the same, but a pathway was added to make a consistent loop around the facility. While the landscape area is kept the same, the types of ground cover and planting strategy has changed. The existing planting design had used river rock, which posed as a trip hazard. In this design proposal, this space is heavily planted with flowers and fountain grasses, using mulch rather than rock because it is a finer grain and less of a trip hazard than rock.



Figure 5.18 | Section A-A: Entry Sequence (by author)

The porch space has not been changed, so that residents still have a covered seating area where they can wait to be picked up. The goals for designing this space, and strategies used to accomplish these goals can be seen on the following page.

Access- Sidewalk/crosswalk connects parking along Little Kitten to front of the facility; first experience through central corridor of the facility

Quality- provide different green material, bringing in birds, butterflies, and other fauna through the use of a showier, flowery landscape

Activity- provides seating area to look out over landscape beds

The designed “Entry Space” can be seen in figure 5.16 to the right.

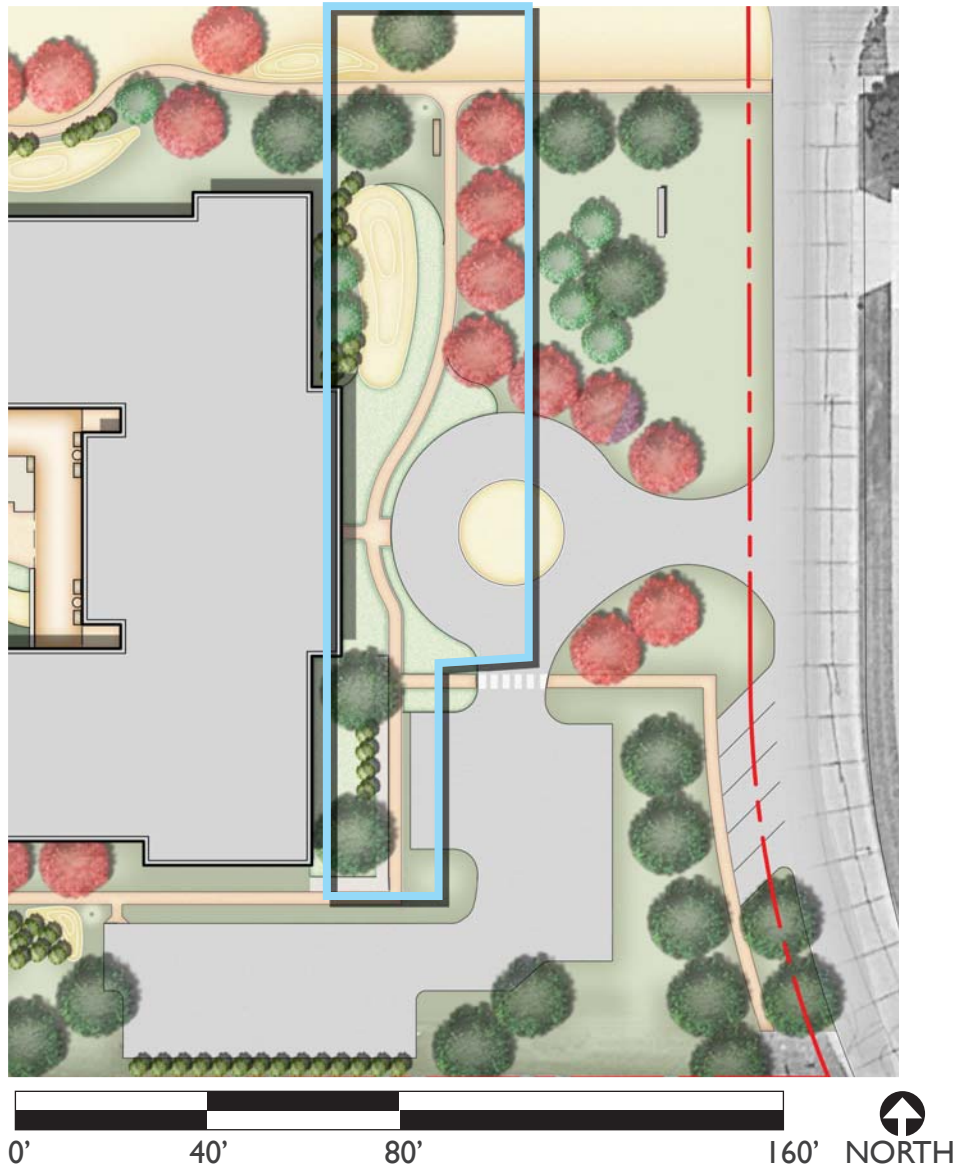


Figure 5.19 | Front Porch Blow-up Plan (by author)

This diagram shows how each question relates to a different hypothesis.



Space 4 | “Landscape Grounds” (South)

The strategy behind the design of this space was to provide access around the whole building, where it had previously been disjointed. Because the space is used as an access path from the parking lot to the rear of the facility, the path was kept primarily straight. The parking area was shortened to allow residents visual access to a planted area rather than just a parking lot. The parking stalls that had previously been located here were relocated along Little Kitten Ave.

Access- proposed extension of path that circulates entire facility; leave existing access to rear of facility; paths are straight and easily navigable

Quality- use of various green materials to screen unattractive utilities; both active and passive spaces are available to residents (paths and seating area)

Activity- Proposed paths along the south side can be used as active spaces; residents whose windows overlook the space have visual access to this space, while also being screened from unattractive views



Key Map

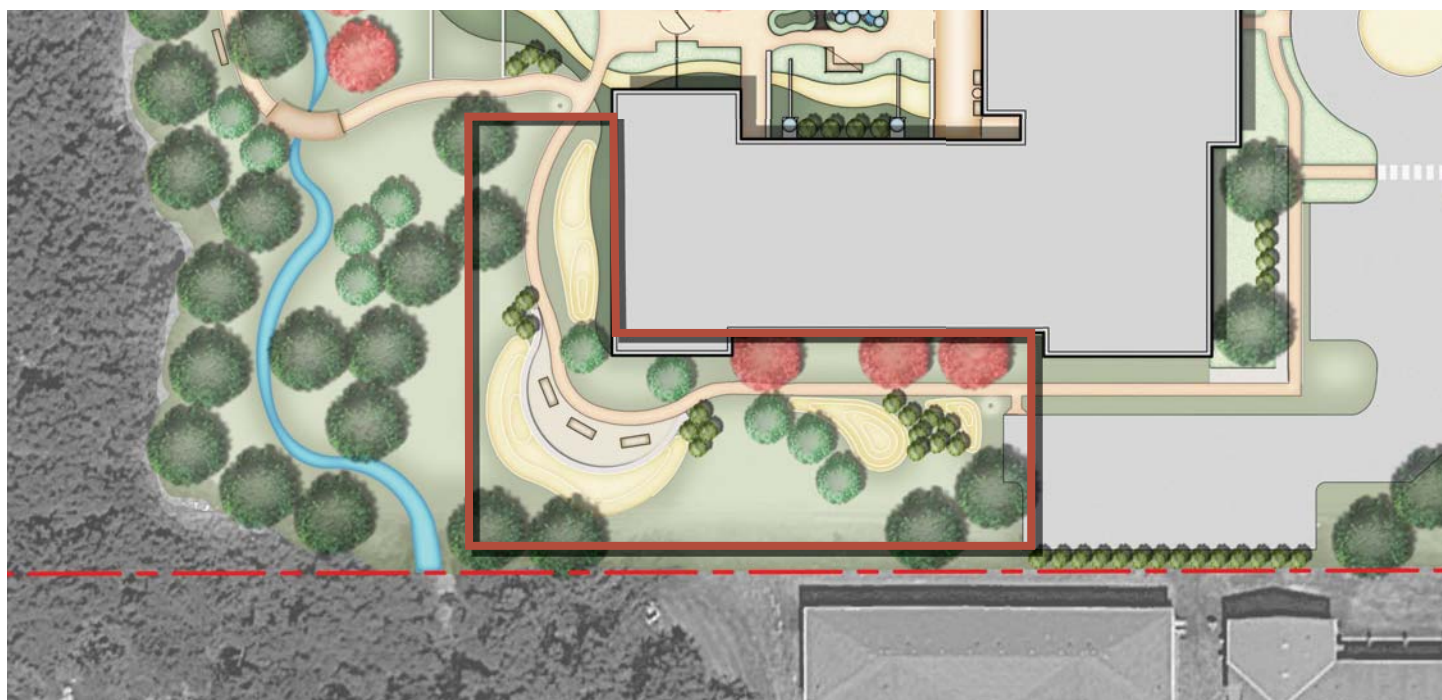


Figure 5.20 | South Landscape Grounds (by author)

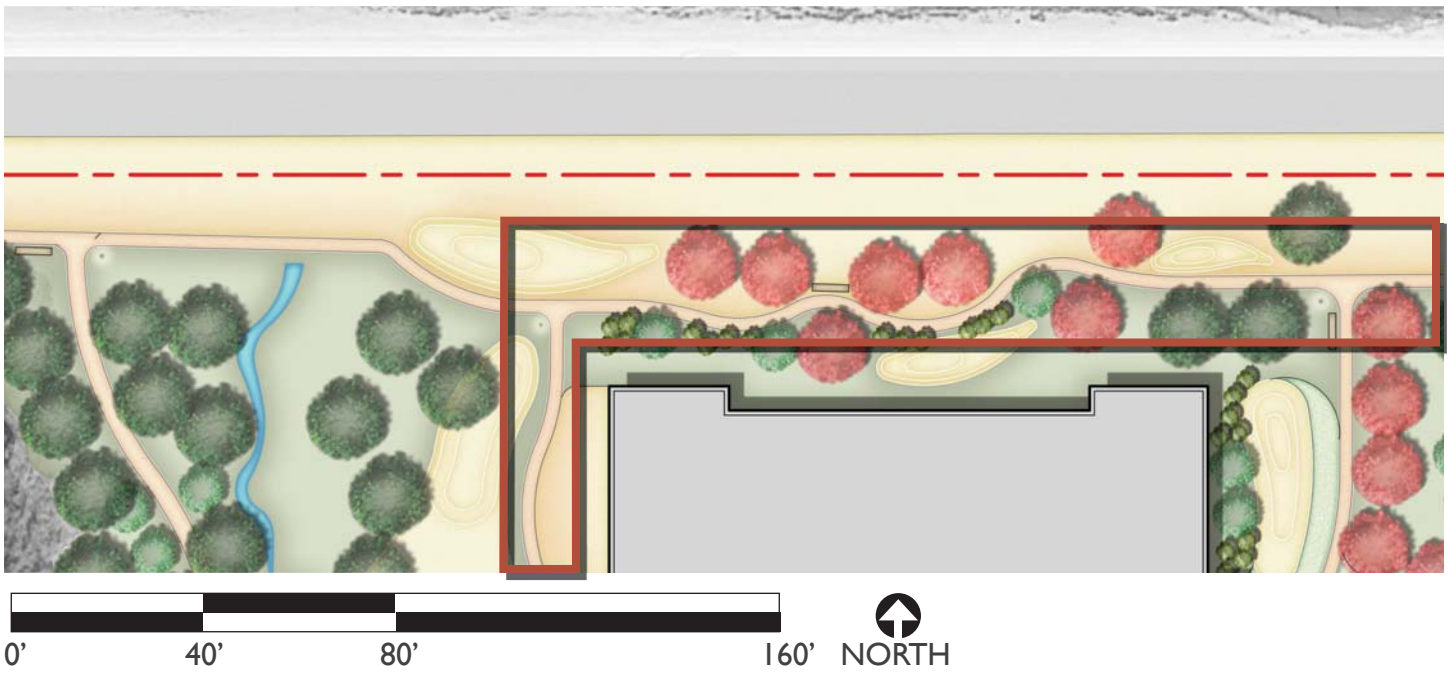


Figure 5.21 | North Landscape Grounds (by author)

Space 4 | “Landscape Grounds” (North)

The north side of Homestead is exposed to a main arterial road, Kimball Ave. For this reason, the primary function of this space is to screen the path and facility from this heavily used roadway. Using various plant material, the pathway is separated from both the facility and Kimball Ave. The vegetation used to separate the path from the residential rooms that look over this space are more sparse and of lower heights.

Access- the space is visible for the residents whose rooms are to the north side of the facility

Quality- use of various green materials keeps users focused on the space and provides a positive distraction; both active and passive spaces are available to residents (paths and seating area)

Activity- proposed paths along the south side can be used as active spaces; residents whose windows overlook the space have visual access to this space



Key Map



Utility Space

The utility space provided parking for both residents and staff. When redesigning this space, a primary goal was to keep all as many parking stalls as there were existing. Because this space infringes on residents' views from their bedroom windows, some of the parking stalls were moved to the street, while the remaining existing stalls were screened from these residents' rooms using planting material and other visual buffer elements.

This space also cut off circulation around the entire facility. To accommodate residents' desire to walk around the whole facility, the existing parking stalls and driveway were moved South by about 6 feet to allow for a sidewalk to be implemented so that users could be better separated from the vehicular traffic. Lastly, the space is used as an access point to the rear or the courtyard space, to help move residents in and out of the facility. This design provides a direct path as well as a handicapped ramp so that residents can still move in and out of the rear of the facility.

In order to provide better access to the surrounding neighborhood and to the proposed parking along Little Kitten Ave., a sidewalk and crosswalk were added. This also accomplishes the goal of separating pedestrians from vehicular traffic.

Phasing Plan

While the implementation of the design solution would be quite costly, some of the amenities that were specified could be implemented over time. The phases would focus first on the priority spaces such as the courtyard and creek areas, then the secondary spaces along the north and south sides of the facility, followed lastly by the tertiary space along the front, which is already intended to be a manicured landscape. Phase 1 would include the implementation of amenities uncovered by the focus group meeting within the courtyard, since that space was identified as the most frequently used space by the residents.

PHASE 1 | COURTYARD

The first phase that should be implemented is the courtyard space because it is the space that is most used, according to the focus group interview findings. The design of this space facilitates the use of all three disability groups (cognitive, ambulatory, and visual) and is also most accessible for all users. Within phase 1, there are priorities as to the order of which amenities get implemented first. The first priority is to provide the amenities that the focus group identified including the residential gardens, water element, seating, and shade structure. The second priority is to install a water collection system and earthwork for the courtyard landscape space. The final aspect to be implemented is the different planting types.

PHASE 2 | NATURE WALK

Phase 2, the space alongside the creek, is the second phase that should be implemented. This space is important because the space is adjacent to the courtyard space and is also a primary piece to the overall concept of providing residents with access to nature. There are three priorities to focus on for this space as well, first being the pathways. The pathways provide physical access throughout the creek space, with pathways wide enough for the residents to use. The second priority is the landscape design and landform portion of the design, providing a visual connection as well as a natural backdrop between the courtyard space and the creek space.

The third priority is the site elements, such as seating and lighting.

PHASE 3 | ENTRYWAY

The entryway is the last phase because the space is already manicured and meant to accentuate the front façade of the assisted living facility. The first priority for this space is to incorporate the pathways so that the areas around the facility can be connected. Following this is the implementation of the landforms and landscape material. This second priority is meant to serve as a backdrop as people drive up to the facility as well as a visual barrier for the residents, so they have a view of green material rather than parking lot.

PHASE 4 | NORTH/SOUTH SIDE FACILITY

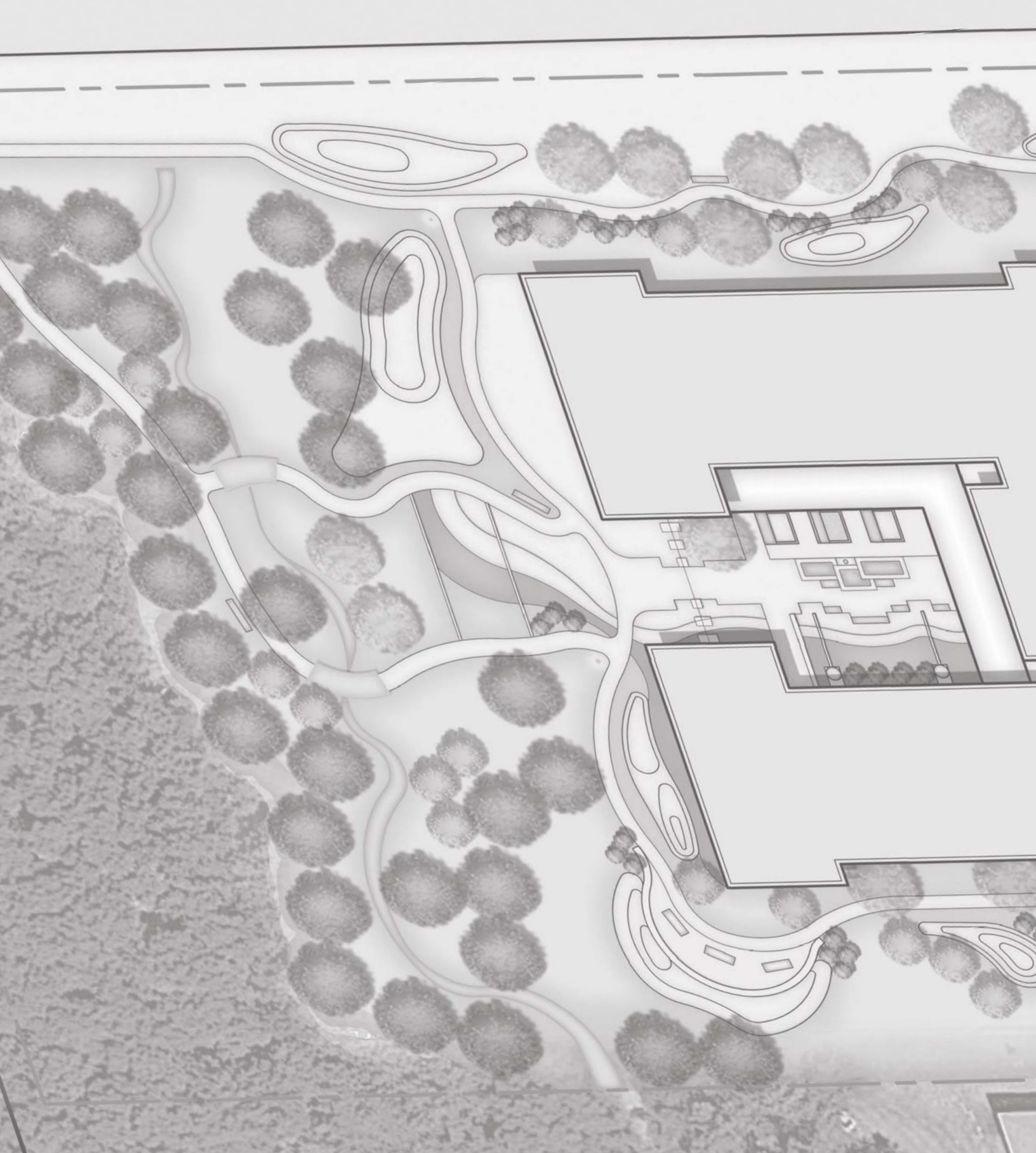
Phase 3, located along the north and south side of the facility, focuses on the pass through spaces that also serve as a visual buffer between the residential rooms and Kimball Ave to the north and the surrounding residential community to the south. First priority for this phase is implementing the pathway, as it is the physical connection to the rest of the spaces. The second priority is implementing the landforms and landscape material, which serve as the buffer. The third priority is the site level elements, including the seating and lighting elements.

MAINTENANCE OPTIONS

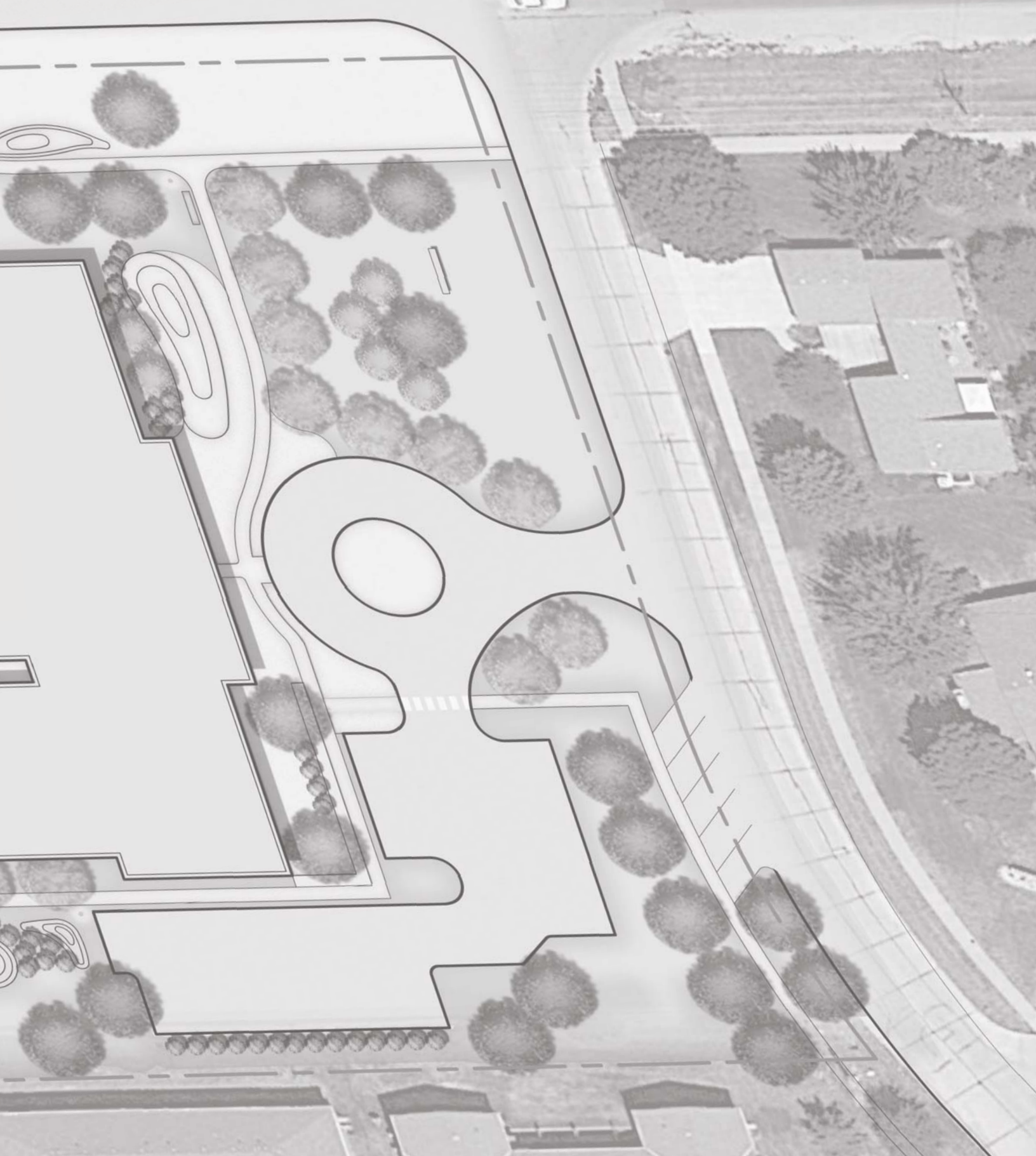
While the grounds are considered private for the residents of Homestead Assisted Living facility, the proposed planting options include a variety of landscape types. The garden space could be maintained by the UFM Community Learning Center, who supervises the Manhattan Community Garden project. Because of the variety of landscape types, some of the proposed landscapes could be considered learning landscapes, offering horticulture students who might be learning about the establishment of a natural prairie with the opportunity to maintain and establish this type of landscape.

The areas outside of the facility walls (creek space, and pathways leading around the facility) are accessible to the whole community, not just the residents living within the assisted living facility. For this reason, the implementation of the proposed pathways and creek space should benefit the community outside the facility. Funding sources and volunteer groups could be used to implement these designs as a means of community improvement.

These strategies are based on the premise of bringing in community groups to the facility, which could be beneficial to the residents as it would provide them interaction with the outside world beyond the facility walls. There is even opportunity for after school programs in elementary, middle, or high school students to come and work for either service or educational opportunities.



6. Conclusion



Key Findings

Research

The research aims for this project were to (1) identify barriers limiting use of the outdoor spaces, and (2) research how access to nature affects physical outdoor activity. From these aims, there were three hypotheses that corresponded to a question asked in the focus group meeting. These findings, alongside the literature analysis, were used to produce design goals.

Design

The three design goals were to (1) improve access to outdoor environment, (2) improve the quality of the outdoor spaces, and (3) encourage outdoor activity. These goals and research findings were utilized in the design outcome to create five spaces designed with the users' ability and purpose in mind. While these typologies were combined with the user abilities to suggest amenities that go in each space, the typologies are applicable to the design of other care facilities.

Limitations

The results of the focus group were generalizable, with a sample population that displayed the full spectrum of residents within Homestead Assisted Living Facility. Additionally, the illnesses and disabilities considered in this study were in line with the national trend. While the results were generalizable for the facility, they may not have been sufficient for all assisted living facilities. Homestead is a traditional type of facility with a similar scale and structure compared to other assisted living facilities, but there are also many other assisted living facilities that cater to an even greater variety of residents ranging in their abilities and disabilities.

With the limited time for data collection and the seasonal time constraint, observations of the users were limited. Because of this limitation, the qualitative study was not as in depth as it could have been. The literature analysis was heavily relied upon to supplement results that were uncovered in the focus group interview,

where the environmental audit could have been used, had the time of year been appropriate.

Recorded results were sometimes difficult to decipher due to residents speaking softly or the background noise from other residents talking, or from the staff who were cleaning the dining room in which this study was being conducted. These conditions could have been improved by communicating the need for a space that had the desired characteristics. The time of year that this meeting occurred also served as a limitation as the trees were bare and the temperature was cooler, contributing to the overall mood of the residents and responses of the participants.

With the limited time for data collection and the seasonal time constraint, observations of the users were limited. Because of this limitation, the qualitative study was not as in depth as it could have been. The literature analysis was heavily relied upon to supplement results that were uncovered in the focus group interview, where the environmental audit could have been used, had the time of year been appropriate. Additionally, the main idea was to provide access to nature for the residents, but there was little consideration given for the design of the interior of the facility or how to incorporate nature into the indoor spaces of the facility.

Because of the accelerated schedule, only the key spaces were designed in depth, while other spaces were designs to reinforce overarching concepts. While the main idea was to provide access to nature to the residents, there was little consideration made for the interior of the facility or how to incorporate nature into the indoor spaces of the facility. The time constraint also limited to less feedback given by the residents and staff during the design development portion of this project.

Future Study

With these limitations in mind, future studies could be done to address which site level amenities would be best suited for the demographic at this facility, such as recommended seating types, or specific lighting requirements for persons with the specified disabilities. While different landscape types were proposed, further research could be done to determine which types of plants would work best within this assisted living community setting. These different landscapes would open up the opportunity for experimental studies to see what kinds of plants or landscapes residents enjoy more, a manicured, flowery landscape, or a naturalized landscape with native grasses.

The current cost to live at Homestead is lower than other facilities such as Meadowlark Hills. If the design recommendations were to be implemented, this cost of living would probably increase for each resident. Future studies could look at funding sources or volunteer groups that could help implement designs to better the community.

Implications and Conclusion

Based on the results, this study provides design guidelines for future assisted living facilities that will enhance visual and physical access to nature. These guidelines relate to the different typologies as seen listed below:

A. Courtyard

- a. Primary access from gathering spaces
- b. Easily navigable
- c. Facilitates use by all
- d. Mix of active and passive space
- e. Aesthetically pleasing
- f. Multi-sensory stimulating

B. Nature Walk

- a. Wide paths
- b. Handrails
- c. Areas for seating
- d. Shaded areas
- e. Less disturbed natural areas
- f. Some level of ambiguity/ interest

C. Surrounding Nature

- a. Heavily vegetated
- b. Relatively untouched/naturalized
- c. Physically inaccessible

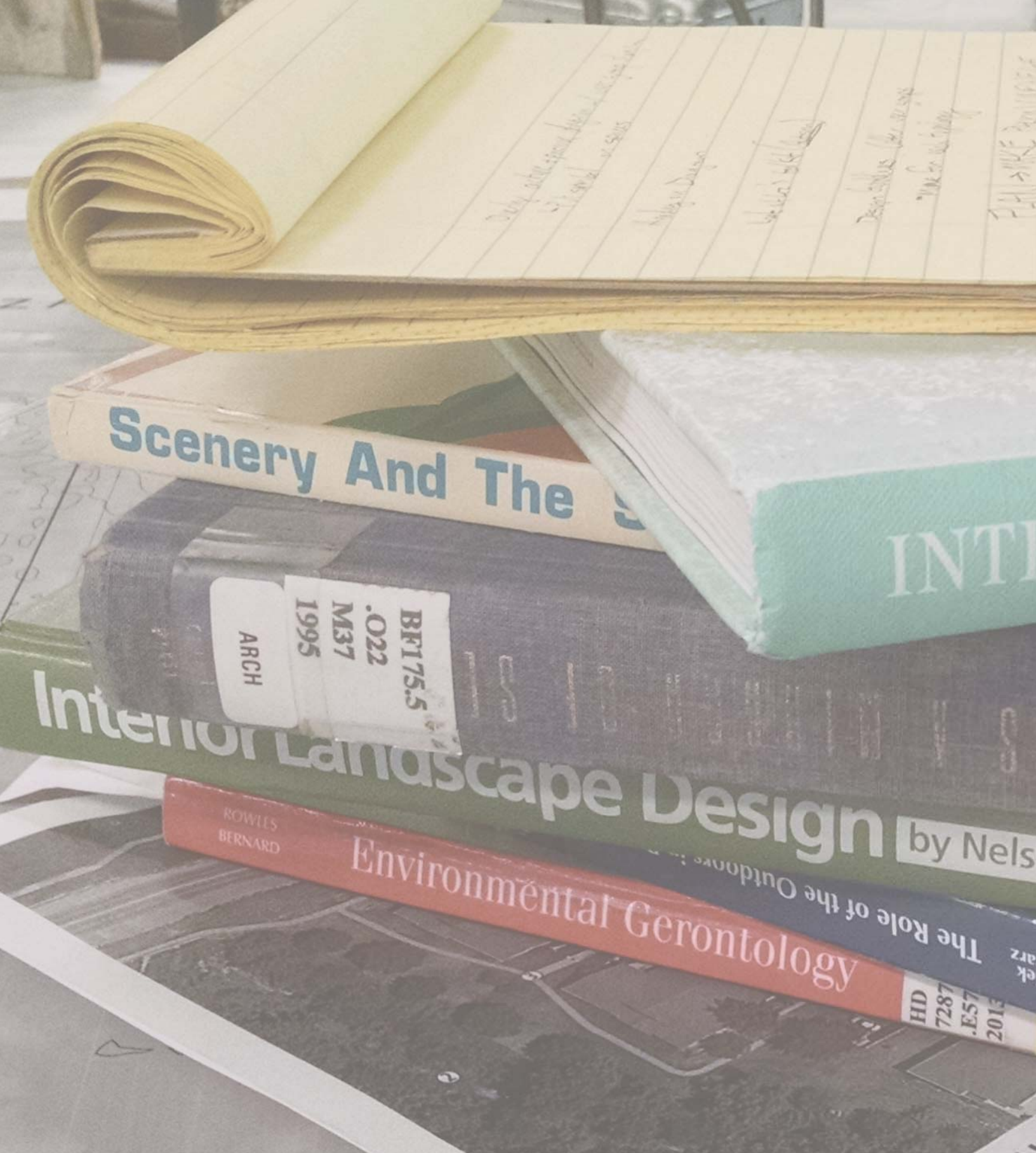
D. Front Porch

- a. Distinguished area for seating and walking
- b. Manicured to accentuate building
- c. Visual buffer area between residents and parking lot

E. Landscape Ground

- a. Secluded yet connected
- b. Buffer vegetation
- c. Pathways that meet ADA requirements

These guidelines are generalizable and applicable to other assisted living facilities that have similar space typologies. After distinguishing which space typologies are present at the facility, the next step is to identify the residents' ability and purpose for using each space. For this study, a focus group review was used to gather that information, and then run through a literature analysis and environmental audit. This process can be used to determine which design elements each space should have. While the synthesis portion could be applicable to other facilities whose residents facing dementia, Parkinson's disease, stroke paralysis, or macular degeneration, other studies should investigate in further detail the abilities of the specified facility. By using these guidelines and the generalizable findings that this study offers, future assisted living facilities can enhance the visual and physical access to nature, which, in turn, can improve health among residents living in these health care facilities.



7. Bibliography

How
1. Cour
2. Creek
3. Exterior Po
Porch
Window Gard

Handwritten notes on lined paper, including the word "FINE" and a simple architectural sketch of a house with a gabled roof.

ERIOR LANDSCAP
SB 419.25
M35
2001
ARCH

OFI
Irich

HONOR
SOCIETY

on Hamn
SB 419.25
.H57
1992
ARCH
GROW
HILL

Rod Schw
KINGER
PUBLISHING COMPANY

Living

source: Bert Die

Bibliography

Alzheimer's Association. "Dementia – Signs, Symptoms, Causes, Tests, Treatment, Care | Alz.org." *Alz.org*, 2016. <http://www.alz.org/what-is-dementia.asp>.

American College of Preventive Medicine. "ACPM Principles on Preventive Medicine and Health Reform: Four Truths About Prevention," September 28, 2015. <http://healthyamericans.org/assets/files/ACPMstatement.pdf>.

American Macular Degeneration Foundation. "Macular Degeneration." *Macular.org*, 2016. <https://www.macular.org/what-macular-degeneration>.

Ball, Mary M., Molly M. Perkins, Frank J. Whittington, Bettye Rose Connell, Carole Hollingsworth, Sharon V. King, Carrie L. Elrod, and Bess L. Combs. "Managing Decline in Assisted Living: The Key to Aging in Place." *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 59, no. 4 (July 1, 2004): S202–12. doi:10.1093/geronb/59.4.S202.

Ball, Scott M. *Livable Communities for Aging Populations: Urban Design for Longevity*. 1 edition. Hoboken, N.J.: Wiley, 2012.

Benedetti, Francesco, Cristina Colombo, Barbara Barbini, Euridice Campori, and Enrico Smeraldi. "Morning Sunlight Reduces Length of Hospitalization in Bipolar Depression." *Journal of Affective Disorders* 62, no. 3 (February 2001): 221–23. doi:10.1016/S0165-0327(00)00149-X.

Bureau, U. S. Census. "American FactFinder - Results." Accessed November 16, 2015. <http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk>.

Caffrey, Christine, Manisha Sengupta, Eunice Park-Lee, Abigail Moss, Emily Rosenoff, and Lauren Harris-Kojetin. "Residents Living in Residential Care Facilities: United States, 2010." Centers for Disease Control and Prevention, US Dept. of Health and Human Services, 2010. <http://www.cdc.gov/nchs/data/databriefs/db91.pdf>.

Center for Disease Control. "National Center for Health Statistics. Healthy People 2000 Final Review," 2001. <http://www.cdc.gov/nchs/data/hp2000/hp2k01.pdf>.

Center for Medicare Advocacy. "Non-Profit vs. For-Profit Nursing Homes: Is There a Difference in Care? || CMA." Accessed January 31, 2016. <http://www.medicareadvocacy.org/non-profit-vs-for-profit-nursing-homes-is-there-a-difference-in-care/>.

Centers for Disease Control and Prevention. "The State of Aging and Health in America 2013." Atlanta, GA: Centers for Disease Control and Prevention, US Dept. of Health and Human Services, 2013. <http://www.cdc.gov/aging/pdf/state-aging-health-in-america-2013.pdf>.

Collins, Claudia C., and Angela M. O'Callaghan. "The Impact of Horticultural Responsibility on Health Indicators and Quality of Life in Assisted Living." *HortTechnology* 18, no. 4 (October 1, 2008): 611–18.

Cooper, Paul. *Interiorscapes: Gardens Within Buildings*. London: MITCH, 2006.

Cranz, Galen, Young, Charlene. "The Role of Design in Inhibiting or Promoting Use of Common Open Space: The Case of Redwood Gardens, Berkeley, CA." *The Role of the Outdoors in Residential Environments for Aging*, 2005, 71–93. doi:10.1300/J081v19n03_05.

Detweiler, Mark B., Taral Sharma, Jonna G. Detweiler, Pamela F. Murphy, Sandra Lane, Jack Carman, Amara S. Chudhary, Mary H. Halling, and Kye Y. Kim. "What Is the Evidence to Support the Use of Therapeutic Gardens for the Elderly?" *Psychiatry Investigation* 9, no. 2 (June 2012): 100–110. doi:10.4306/pi.2012.9.2.100.

Eric Carlson. "Assisted Living: Problems and Policy Issues." Case, n.d.

Frumkin, Howard. "Beyond Toxicity: Human Health and the Natural Environment." *Journal of Preventive Medicine*, 2001. <http://willsull.net/resources/270-Readings/Frumkin2001.pdf>.

Galson, Steven K. "Self-Management Programs: One Way to Promote Healthy Aging." *Public Health Reports* 124, no. 4 (2009): 478–80.

Gordon, Neil F., Meg Gulanick, Fernando Costa, Gerald Fletcher, Barry A. Franklin, Elliot J. Roth, and Tim Shephard. "Physical Activity and Exercise Recommendations for Stroke Survivors An American Heart Association Scientific Statement From the Council on Clinical Cardiology, Subcommittee on Exercise, Cardiac Rehabilitation, and Prevention; the Council on Cardiovascular Nursing; the Council on Nutrition, Physical Activity, and Metabolism; and the Stroke Council." *Stroke* 35, no. 5 (May 1, 2004): 1230–40. doi:10.1161/01.STR.0000127303.19261.19.

Grant-Savelle, Stacey. "Outdoor Space." *UWM*, 2015. https://www4.uwm.edu/dementiadesigninfo/data/white_papers/Outdoor%20Spaces.pdf.

Hammer, Nelson. *Interior Landscape Design*. New York, NY: McGraw-Hill, 1992.

Hammer, Nelson R. *Interior Landscapes: An American Design Portfolio of Green Environments*. Gloucester, MA; Cincinnati, OH: Rockport Pub, 1999.

Jerome L. Kaufman. "Planning and An Aging Population." Informational. American Society of Planning Officials, 1961.

Joseph, Anjali, Craig Zimring, Lauren Harris-Kojetin, and Kristen Kiefer. "Presence and Visibility of Outdoor and Indoor Physical Activity Features and Participation in Physical Activity Among Older Adults in Retirement Communities." *The Role of the Outdoors in Residential Environments for Aging*, 2005, 141. doi:10.1300/J081v19n03_08.

Kane, Robert L., and John R. Mach. "Improving Health Care for Assisted Living Residents." *The Gerontologist* 47, no. suppl 1 (December 1, 2007): 100–109. doi:10.1093/geront/47.Supplement_1.100.

Kearney, Anne, Winterbottom, Daniel. "Nearby Nature and Long-Term Care Facility Residents: Benefits and Design Recommendations." *The Role of the Outdoors in Residential Environments for Aging*, 2005, 7–28. doi:10.1300/J081v19n03_02.

Keus, Samyra H.J., Bastiaan R. Bloem, Erik J.M. Hendriks, Alexandra B. Bredero-Cohen, and Marten Munneke. "Evidence-Based Analysis of Physical Therapy in Parkinson's Disease with Recommendations for Practice and Research." *Movement Disorders* 22, no. 4 (March 15, 2007): 451–60. doi:10.1002/mds.21244.

Larson, Jean, and Mary Jo Kreitzer. "Healing by Design: Healing Gardens and Therapeutic Landscapes." *Implications* 02, no. 10 (March 2007): 1–7.

Lavizzo-Mourey, Risa, and J. Michael McGinnis. "Making the Case for Active Living Communities." *American Journal of Public Health* 93, no. 9 (September 1, 2003): 1386–88. doi:10.2105/AJPH.93.9.1386.

Lee, KoFan. "The Role of Outdoor Recreation in Promoting Human Health." *Illuminare: A Student Journal in Recreation, Parks, and Leisure Studies* 9, no. 1 (2011): 47–58.

Marcus, Clare Cooper, and Marni Barnes. "Gardens in Healthcare Facilities: Uses, Therapeutic Benefits, and Design Recommendations." The Center for Health Design, Inc., 1995. <https://www.healthdesign.org/sites/default/files/Gardens%20in%20HC%20Facility%20Visits.pdf>.

Marcus, Clare Cooper, and Marni Barnes. *Healing Gardens: Therapeutic Benefits and Design Recommendations*. New York, NY: John Wiley & Sons, Inc., 1999.

Marcus, Clare Cooper, and Marni Barnes. "Introduction: Historical and Cultural Perspective on Healing Gardens," n.d.

Mayo Clinic Staff. "Parkinson's Disease Symptoms - Mayo Clinic." *Mayo Clinic*, 2016. <http://www.mayoclinic.org/diseases-conditions/parkinsons-disease/basics/symptoms/con-20028488>.

Mitchell, Judith M., and Bryan J. Kemp. "Quality of Life in Assisted Living Homes A Multidimensional Analysis." *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 55, no. 2 (March 1, 2000): P117–27. doi:10.1093/geronb/55.2.P117.

Myers, Jane E., and Melanie C. Harper. "Evidence-Based Effective Practices With Older Adults." *Journal of Counseling and Development* : JCD 82, no. 2 (Spring 2004): 207–18.

"Paralysis." *Stroke.org*, July 16, 2014. <http://www.stroke.org/we-can-help/survivors/stroke-recovery/post-stroke-conditions/physical/paralysis>.

Rodiek, Susan. *The Role of the Outdoors in Residential Environments for Aging*. Routledge, 2013. http://www.edra.org/sites/default/files/publications/EDRA39-Rodiek_1.pdf.

Rodiek, Susan, and Babyak. "Outdoor Space for Aging: Environmental Assessment and Survey of Assisted Living Residents and Staff." *EDRA* 39 (May 28, 2008): 62–69.

Rodiek, Susan, and Benyamin Schwarz. *The Role of the Outdoors in Residential Environments for Aging*. 1 edition. New York: Routledge, 2006.

Sugiyama, Takemi, and Catharine Ward Thompson. "Environmental Support for Outdoor Activities and Older People's Quality of Life." *The Role of the Outdoors in Residential Environments for Aging*, 2005, 167–85. doi:10.1300/J081v19n03_09.

Therapeutic Landscapes Network. "Gardens In Healthcare and Related Facilities." Database. *Healing Gardens*, 2015. <http://www.healinglandscapes.org/healthcare-gardens/index.html>.

The Role of the Outdoors in Residential Environments for Aging. 1 edition. New York: Routledge, 2006.

Ulrich, Roger S. "Effects of Gardens on Health Outcomes: Theory and Research." In *Healing Gardens: Therapeutic Benefits and Design Recommendations*, 27–86. New York, NY: John Wiley & Sons, Inc., 1999.

Ulrich, Roger S. "View Through a Window May Influence Recovery from Surgery." *Science*. American Association for the Advancement of Science, 1984. <https://mdc.mo.gov/sites/default/files/resources/2012/10/ulrich.pdf>.

U.S. Census Bureau. "Population Estimates, July 1, 2014, (V2014)," September 14, 2015. <http://www.census.gov/quickfacts/>.

U.S. Department of Health and Human Services. "Physical Activity and Health: A Report of the Surgeon General." Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 1996. <http://www.cdc.gov/nccdphp/sgr/pdf/sgrfull.pdf>.

World Blind Union. "Universal Design," 2014. <http://www.worldblindunion.org/English/resources/Pages/General-Documents.aspx>.

Zhe Wang, Susan Rodiek, and Mardelle Shepley. "Residential Site Environments and Yard Activities." Texas A&M University Department of Architecture, 2006. http://www.aia.org/aiaucmp/groups/ek_public/documents/pdf/aiap080045.pdf.

Table References

Table 3.1 Typologies

Holzum, Andrew. *Typologies*. [Chart]. Microsoft Excel. 2016

Adapted from Marcus & Barnes. *Gardens in Healthcare Facilities: Uses, Therapeutic Benefits, and Design Recommendations*. The Center for Health Design, Inc. 1995.

Table 4.1 Adapted Typologies

Holzum, Andrew. *Typologies*. [Chart]. Microsoft Excel. 2016

Adapted from Marcus & Barnes. *Gardens in Healthcare Facilities: Uses, Therapeutic Benefits, and Design Recommendations*. The Center for Health Design, Inc. 1995.

Table 4.2 Common Chronic Illness Findings

Holzum, Andrew. *Common Chronic Illness Findings*. [Chart]. Microsoft Excel. 2016. Source:

World Blind Union. "Universal Design," 2014. <http://www.worldblindunion.org/English/resources/Pages/General-Documents.aspx>.

"Paralysis." *Stroke.org*, July 16, 2014. <http://www.stroke.org/we-can-help/survivors/stroke-recovery/post-stroke-conditions/physical/paralysis>.

Keus, Samyra H.J., Bastiaan R. Bloem, Erik J.M. Hendriks, Alexandra B. Bredero-Cohen, and Marten Munneke. "Evidence-Based Analysis of Physical Therapy in Parkinson's Disease with Recommendations for Practice and Research." *Movement Disorders* 22, no. 4 (March 15, 2007): 451–60. doi:10.1002/mds.21244.

American Macular Degeneration Foundation. "Macular Degeneration." *Macular.org*, 2016. <https://www.macular.org/what-macular-degeneration>.

Table 5.1 Health Outcomes and Recommendations

Holzum, Andrew. *Health Outcomes and Recommendations*. [Chart]. Microsoft Excel. 2016. Source:

World Blind Union. "Universal Design," 2014. <http://www.worldblindunion.org/English/resources/Pages/General-Documents.aspx>.

"Paralysis." *Stroke.org*, July 16, 2014. <http://www.stroke.org/we-can-help/survivors/stroke-recovery/post-stroke-conditions/physical/paralysis>.

Keus, Samyra H.J., Bastiaan R. Bloem, Erik J.M. Hendriks, Alexandra B. Bredero-Cohen, and Marten Munneke. "Evidence-Based Analysis of Physical Therapy in Parkinson's Disease with Recommendations for Practice and Research." *Movement Disorders* 22, no. 4 (March 15, 2007): 451–60. doi:10.1002/mds.21244.

American Macular Degeneration Foundation. "Macular Degeneration." *Macular.org*, 2016. <https://www.macular.org/what-macular-degeneration>.

Figure References

Figure 5.11 Materiality (A-F)

Holzum, Andrew. *Materiality (A-F)*. [Diagram]. Adobe Illustrator; AutoCad. (2016).

A) Victor Stanley. *RB-28*. Victor Stanley, April 20, 2016. <http://www.victorstanley.com/product/rb-28/>.

B) “Kennedy Rocking Chair, Lucky Turquoise - Modern - Rocking Chairs - by Thrive Home Furnishings.” Houzz. Accessed April 22, 2016. <http://www.houzz.com/photos/1180465/Kennedy-Rocking-Chair-Lucky-Turquoise-modern-rocking-chairs>.

C) Westview Concrete. “Permeable 3-1/4’x18.” Westview Concrete. Accessed April 20, 2016. <http://www.westviewconcrete.com/products/hanover-pavers/permeable-pavers>.

D) “3 Types of Pavers for Your Outdoor Space.” Angie’s List | Find a Local Business, Ratings, Reviews, Deals, November 21, 2013. <https://www.angieslist.com/articles/3-types-pavers-your-outdoor-space.htm>.

E) Holzum, Andrew. “Planter Box”. [Sketchup Model]. SketchUp. (2016)

F) Simple Decorating Ideas. “Simple Modern Home Fence Design Considerations.” 4-Homedecor, 2013. <http://4-homedecor.com/simple-modern-home-fence-design-consideration/>.

Appendix References

Appendix A Agenda for Focus Group Meeting

Holzum, Andrew. *Agenda for Focus Group Meeting*. [Memo]. Microsoft Word. (2016).

Appendix B Focus Group Questions

Holzum, Andrew. *Focus Group Questions*. [Memo]. Adobe InDesign. (2016).

Appendix C Questions for Activity Director

Holzum, Andrew. *Questions for Activity Director*. [Memo]. Adobe InDesign. (2016).

Appendix D1 Environmental Audit (Site Map)

Holzum, Andrew. *Environmental Audit (Site Map)*. [Map]. Adobe Illustrator; Google Earth Pro. (2016).

Appendix D2 Environmental Audit (Cont.)

Holzum, Andrew. *Environmental Audit (Cont.)*. [Memo]. Adobe InDesign. (2016).

Appendix D3 Environmental Audit (Cont.)

Holzum, Andrew. *Environmental Audit (Cont.)*. [Memo]. Adobe InDesign. (2016).

Appendix F Focus Group Consent Form

Holzum, Andrew. *Focus Group Consent Form*. [Memo]. Adobe InDesign. (2016).

Appendix G Activity Director Consent Form

Holzum, Andrew. *Activity Director Consent Form*. [Memo]. Adobe InDesign. (2016).

APPENDIX A- AGENDA FOR FOCUS GROUP MEETING

Agenda Focus Group Meeting

1. Pre-meeting

- Arrive at 9:45am
- As participants come in, ask them to fill out Consent form
- Give Activity Director consent form and questionnaire

2. Introduction of self and study: 10- 10:10am

- Goals of this study is to investigate:
 1. Your access to nature
 2. Your access to outdoor physical activity resources such as trails, seating, etc.
 3. Your perceptions regarding both physical and visual access to nature and perception of the different outdoor environments for safety, variety, and the impact these environments have on your health
- Outcome:
 - o The outcome of this study is to provide this facility with recommendations on how it could be improved based on what is discussed today.
 - o I will be compiling the results from this discussion along with other research, and will share it with you once the document is finished.
- Thanks
 - o Again, your participation is voluntary. Thank you in advance for your participation.
- **Before starting, has everyone filled out a consent form?**

3. Directions 10:10-10:15

- This focus group will be asked 5 questions one at a time. We will go around in a circle so that each person gets a chance to answer each question. If a participant wishes to be skipped, they can say “pass” and we will move on to the next person. If you are skipped but want to answer after the rest of the participants have given their answers, you may do so at the end of the round. Each person will have roughly one minute to answer. The question can be repeated as needed.

APPENDIX B- FOCUS GROUP QUESTIONS

Questions for Focus Groups

Andrew Holzum | Master's Degree Candidate

ACCESSIBLE LANDSCAPES FOR AN AGING POPULATION: USING NATURE TO ENHANCE QUALITY OF LIFE IN ASSISTED LIVING FACILITIES

Your participation will help identify the residents personal physical activity levels, barriers that might limit the use of the natural environment, the level of access to natural environments, the quality of existing spaces, and the importance of the natural environment to the residents.

NAME OF FACILITY: _____

NUMBER OF PARTICIPANTS: _____

FOCUS GROUP NUMBER: _____

QUESTIONS TO BE ASKED OF RESIDENTS:

1. Which outdoor space do you use the most and what do you use the space for? If the space is not numbered on this board, please place a post it on the area that you use. How important is having access to this area to you and your physical health?
2. What do you think limits the amount that you use the outdoor spaces or causes you to be the most inactive?
3. What elements do you feel are lacking in the outdoor spaces and what elements would you like to see added? Are you satisfied with the of variety of spaces that the facility offers you?
4. Does the window in your room look over a pleasant natural space, a parking lot or a pathway and are you satisfied with this view? Does this have any effect on the amount of physical outdoor activity?
5. Do the outdoor spaces encourage you to be physically active while also providing you with areas to sit, meditate, or relax?

APPENDIX C- QUESTIONS FOR ACTIVITY DIRECTOR

Questionnaire for Activities Director

Andrew Holzum | Master's Degree Candidate

ACCESSIBLE LANDSCAPES FOR AN AGING POPULATION: USING NATURE TO ENHANCE QUALITY OF LIFE IN ASSISTED LIVING FACILITIES

Your participation will help identify the residents personal physical activity levels, barriers that might limit the use of the natural environment, the level of access to natural environments, the quality of existing spaces, and the importance of the natural environment to the residents.

NAME OF FACILITY: _____

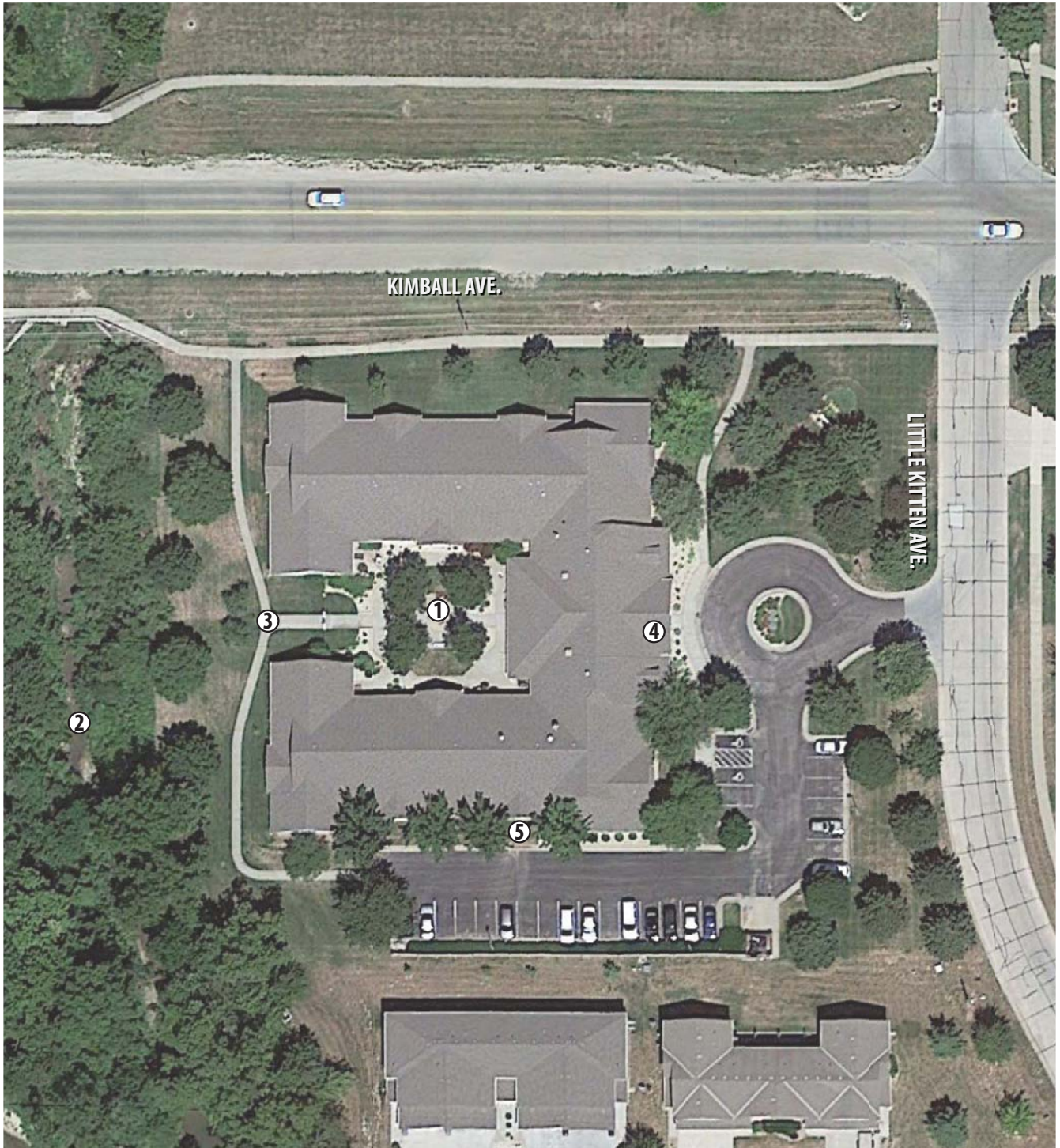
APPROXIMATE NUMBER OF RESIDENTS: _____

QUESTIONS FOR ACTIVITY DIRECTORS:

Please answer these questions to the best of your knowledge.

1. How often do the existing green spaces get used weekly by a resident?
2. How frequently do residents participate in physical activity per week?
3. What is the general age of the residents who use the green space?
4. What are the most common chronic conditions that the residents in your facility face?
5. Do residents in the assisted living facilities have plants within their rooms, or access to window views that overlook a natural environment?
6. What barriers do you think exist that cause the outdoor spaces to be unused and how do you think these barriers can be overcome?

APPENDIX D I - ENVIRONMENTAL AUDIT (SITE MAP)



Homestead Assisted Living

- 1. Courtyard
- 2. Creek
- 3. Exterior Path
- 4. Porch
- 5. Window Gardens

HOMESTEAD

APPENDIX D2- ENVIRONMENTAL AUDIT (CONT.)

Observational Study Tool

To be conducted by Andrew Holzum | Master's Degree Candidate

Contact with the Outside World(outside of facility boundary):

Sidewalks:

- Around Facility
- Leading to Neighboring Community
- Separated from Parking

Location of facility:

- Secluded from Surrounding neighborhoods
- Integrated with neighboring community

Sidewalks:

- Around Facility
- Separated from Parking

Indoor and Outdoor Connection (Visual Accessibility):

Visibility:

- Bedroom Windows look over outdoor areas
- Activity rooms (i.e. workout rooms) look over natural outdoor areas
- Dining room windows look over natural outdoor areas

Natural Elements:

- Indoor plants
- Pictures depicting nature

Freedom, Choice, and Variety:

Availability (Outdoor)

Number of available outdoor spaces:

1 2 3 >3

- Trails/Walking Paths
- Courtyards
- Porch/Patio
- Gardens
- Plaza

Comfort and Accessibility of outdoor Space/Trail: # _____ I _____

Access

Distance from facility

Connected within 100ft. >100ft.

Comfort

Difficulty Navigating

Easy Medium Hard

- Seating Areas Available (#_____)

Level of Visual Interest from seating areas

High Medium Low

Safety and Security (OMIT FOR TRAILS)

Level of Enclosure (Omit for trails)

Enclosed Semi-Enclosed Open

- Presence of visual trip hazards
- Separation of pedestrian and vehicular traffic

Behavior Observations:

Additional Comments:

APPENDIX D3- ENVIRONMENTAL AUDIT (CONT.)

Comfort and Accessibility of outdoor Space/Trail: # 2

<p>Access Distance from facility Connected within 100ft. >100ft.</p> <p>Comfort Difficulty Navigating Easy Medium Hard</p> <p><input type="checkbox"/> Seating Areas Available (#_____)</p> <p>Level of Visual Interest from seating areas High Medium Low</p>	<p>Safety and Security (OMIT FOR TRAILS) Level of Enclosure (Omit for trails) Enclosed Semi-Enclosed Open</p> <p><input type="checkbox"/> Presence of visual trip hazards</p> <p><input type="checkbox"/> Separation of pedestrian and vehicular traffic</p>
---	---

Comfort and Accessibility of outdoor Space/Trail: # 3

<p>Access Distance from facility Connected within 100ft. >100ft.</p> <p>Comfort Difficulty Navigating Easy Medium Hard</p> <p><input type="checkbox"/> Seating Areas Available (#_____)</p> <p>Level of Visual Interest from seating areas High Medium Low</p>	<p>Safety and Security (OMIT FOR TRAILS) Level of Enclosure (Omit for trails) Enclosed Semi-Enclosed Open</p> <p><input type="checkbox"/> Presence of visual trip hazards</p> <p><input type="checkbox"/> Separation of pedestrian and vehicular traffic</p>
---	---

Comfort and Accessibility of outdoor Space/Trail: # 4

<p>Access Distance from facility Connected within 100ft. >100ft.</p> <p>Comfort Difficulty Navigating Easy Medium Hard</p> <p><input type="checkbox"/> Seating Areas Available (#_____)</p> <p>Level of Visual Interest from seating areas High Medium Low</p>	<p>Safety and Security (OMIT FOR TRAILS) Level of Enclosure (Omit for trails) Enclosed Semi-Enclosed Open</p> <p><input type="checkbox"/> Presence of visual trip hazards</p> <p><input type="checkbox"/> Separation of pedestrian and vehicular traffic</p>
---	---

Comfort and Accessibility of outdoor Space/Trail: # 5


<p>Access Distance from facility Connected within 100ft. >100ft.</p> <p>Comfort Difficulty Navigating Easy Medium Hard</p> <p><input type="checkbox"/> Seating Areas Available (#_____)</p> <p>Level of Visual Interest from seating areas High Medium Low</p>	<p>Safety and Security (OMIT FOR TRAILS) Level of Enclosure (Omit for trails) Enclosed Semi-Enclosed Open</p> <p><input type="checkbox"/> Presence of visual trip hazards</p> <p><input type="checkbox"/> Separation of pedestrian and vehicular traffic</p>
---	---

APPENDIX E- IRB APPROVAL LETTER



University Research Compliance Office

TO: Hyung Jin Kim Proposal Number: 8086
 LARCP
 208 Seaton

FROM: Rick Scheidt, Chair 
 Committee on Research Involving Human Subjects

DATE: 02/03/2016

RE: Approval of Proposal Entitled, "Accessible Landscapes for an Aging Population: Using Nature to Enhance Quality of Life in Assisted Living Facilities."

The Committee on Research Involving Human Subjects has reviewed your proposal and has granted full approval. This proposal is approved for one year from the date of this correspondence, pending "continuing review."

APPROVAL DATE: 02/03/2016

EXPIRATION DATE: 02/03/2017

Several months prior to the expiration date listed, the IRB will solicit information from you for federally mandated "continuing review" of the research. Based on the review, the IRB may approve the activity for another year. If continuing IRB approval is not granted, or the IRB fails to perform the continuing review before the expiration date noted above, the project will expire and the activity involving human subjects must be terminated on that date. Consequently, it is critical that you are responsive to the IRB request for information for continuing review if you want your project to continue.

In giving its approval, the Committee has determined that:

- There is no more than minimal risk to the subjects.
 There is greater than minimal risk to the subjects.

This approval applies only to the proposal currently on file as written. Any change or modification affecting human subjects must be approved by the IRB prior to implementation. All approved proposals are subject to continuing review at least annually, which may include the examination of records connected with the project. Announced post-approval monitoring may be performed during the course of this approval period by URCO staff. Injuries, unanticipated problems or adverse events involving risk to subjects or to others must be reported immediately to the Chair of the IRB and / or the URCO.

APPENDIX FI- FOCUS GROUP CONSENT FORM

KANSAS STATE UNIVERSITY

PROJECT TITLE:

Accessible Landscapes for an Aging Population:
Using Nature to Enhance Quality of Life in Assisted Living Facilities

EXPIRATION DATE OF PROJECT:

APPROVAL DATE OF PROJECT:

PRINCIPAL INVESTIGATOR:

Hyung Jin Kim, Assistant Professor, Department of Landscape Architecture/Regional and Community Planning,
Kansas State University

CONTACT AND PHONE FOR ANY PROBLEMS/QUESTIONS: Andrew Holzum; lacjr@ksu.edu; 785-532-3224

IRB CHAIR CONTACT/PHONE INFORMATION:

- Rick Scheidt, Chair, Committee on Research Involving Human Subjects, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224.
- Jerry Jaax, Associate Vice President for Research Compliance and University Veterinarian, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224.

PURPOSE OF THE RESEARCH: Your participation will help identify your personal physical activity levels, barriers that might limit your use of the natural environment, your level of access to natural environments, the quality of existing spaces, and the importance of the natural environment to you.

PROCEDURES OR METHODS TO BE USED: This focus group interview will be conducted by the interviewer (Andrew Holzum, Graduate Student) to see what barriers might be limiting how much outdoor spaces get used (such as patios, gardens, courtyards, etc.). Five questions will be asked of the six residents participating in each of the focus groups. This interview will be conducted in a round table manner, where we will go around in a circle to ensure that each participant has an opportunity to answer each question. Participants in the focus groups are expected to contribute valid responses pertaining to each question when it is their turn to answer. These responses will be audio recorded so that they can be referenced when analyzing the results of the study. The interview will last about an hour to an hour and fifteen minutes. Participants may withdraw from the interview at anytime, and the information collected will remain confidential.

LENGTH OF STUDY: Each focus group interview will last approximately an hour to an hour and fifteen minutes.

RISKS OR DISCOMFORTS ANTICIPATED: There are no foreseeable risks associated with your participation in this study.

BENEFITS ANTICIPATED: Your feedback will be used to identify design recommendations for the assisted living facility in which you live.

APPENDIX FI - FOCUS GROUP CONSENT FORM (CONT.)

EXTENT OF CONFIDENTIALITY: Your names will not be referenced in the final report. All responses will be recorded through the use of a tape recorder, but the information gathered from these recordings will not reference the particular individual.

TERMS OF PARTICIPATION: I understand this project is research, and that my participation is completely voluntary. I also understand that if I decide to participate in this study, I may withdraw my consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits, or academic standing to which I may otherwise be entitled.

I verify that my signature below indicates that I have read and understand this consent form, and willingly agree to participate in this study under the terms described, and that my signature acknowledges that I have received a signed and dated copy of this consent form.

PARTICIPANT NAME: _____

PARTICIPANT SIGNATURE: _____

DATE: _____

WITNESS TO SIGNATURE: (PROJECT STAFF) _____

DATE: _____

APPENDIX G1- ACTIVITY DIRECTOR CONSENT FORM

Consent Form

KANSAS STATE UNIVERSITY

PROJECT TITLE:

Accessible Landscapes for an Aging Population:
Using Nature to Enhance Quality of Life in Assisted Living Facilities

EXPIRATION DATE OF PROJECT:

APPROVAL DATE OF PROJECT:

PRINCIPAL INVESTIGATOR:

Hyung Jin Kim, Assistant Professor, Department of Landscape Architecture/Regional and Community Planning, Kansas State University

CONTACT AND PHONE FOR ANY PROBLEMS/QUESTIONS: Andrew Holzum; lacjr@ksu.edu; 785-532-3224

IRB CHAIR CONTACT/PHONE INFORMATION:

- Rick Scheidt, Chair, Committee on Research Involving Human Subjects, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224.
- Jerry Jaax, Associate Vice President for Research Compliance and University Veterinarian, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224.

PURPOSE OF THE RESEARCH: Your participation will help identify the residents personal physical activity levels, barriers that might limit the use of the natural environment, the level of access to natural environments, the quality of existing spaces, and the importance of the natural environment to the residents.

PROCEDURES OR METHODS TO BE USED: The questionnaire will be filled out by the activities director to determine the general health of the residents who live in the Assisted Living Facility at which the study is being conducted. Five question will be asked regarding the frequency that outdoor spaces are being used, frequency of physical activity, quality of existing living spaces, and individual factors of the residents. These questions will require short write-in answers. The expectations of the activity director is that they will contribute valid responses pertaining to each question to the best of their ability. The answers of these questions will be used in the analysis portion of the study, and will appear in the final report. The interview will last about an hour to an hour and fifteen minutes. Participants may withdraw from the interview at anytime, and the information collected will remain confidential.

LENGTH OF STUDY: Each focus group interview will last approximately an hour to an hour and fifteen minutes.

RISKS OR DISCOMFORTS ANTICIPATED: There are no foreseeable risks associated with your participation in this study.

APPENDIX G1 - ACTIVITY DIRECTOR CONSENT FORM (CONT.)

BENEFITS ANTICIPATED: Your feedback will be used to identify design recommendations for the assisted living facility in which you live.

EXTENT OF CONFIDENTIALITY: Your names will not be referenced in the final report. All responses for the four assisted living facilities will be recorded and analyzed, but the information gathered from these questions will not reference the particular individual.

TERMS OF PARTICIPATION: I understand this project is research, and that my participation is completely voluntary. I also understand that if I decide to participate in this study, I may withdraw my consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits, or academic standing to which I may otherwise be entitled.

I verify that my signature below indicates that I have read and understand this consent form, and willingly agree to participate in this study under the terms described, and that my signature acknowledges that I have received a signed and dated copy of this consent form.

PARTICIPANT NAME: _____

PARTICIPANT SIGNATURE: _____

DATE: _____