

## ABSTRACT

Title of Thesis: A LANDSCAPE DESIGN FOR HEALTH AND WELLNESS AT THE FRIENDS HOUSE RETIREMENT COMMUNITY

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Nature can play a vital role in people's health. The need to access nature, and the barriers to doing so, change with each stage of life. Research highlights the importance of access to the outdoors and engagement with nature for older adults in achieving physical and psychological well-being.

As people live longer and the senior population grows, there is increasing demand for well-designed residential communities that maximize residents' health and quality of life. It is particularly important to find solutions that afford access to nature for those facilities.

This thesis explores the role that landscape architecture can play in improving the quality of life for seniors at residential facilities, retirement centers and nursing homes. The project employs research-informed strategies for providing safe, easy and rewarding access to nature at the Friends House Retirement Community in Sandy Spring, Maryland.

A literature review, site visits, and site inventory and analysis led to development of a design proposal that affords a restorative outdoor environment for Friends House where residents can engage with nature and each other. The site's significant natural and cultural resources are preserved and amplified.

A LANDSCAPE DESIGN FOR HEALTH AND WELLNESS AT THE FRIENDS  
HOUSE RETIREMENT COMMUNITY

by

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## List of Abbreviations

ADA: Americans with Disabilities Act

FHRC: Friends House Retirement Community

UDP: Universal Design Principles

# Chapter 1: Introduction

## Introduction

This Master of Landscape Architecture thesis proposes a new landscape design for the Friends House Retirement Community in Sandy Springs, Maryland. Nature engagement has many physiological and psychological benefits (Kuo, 2015). The needs of individuals and groups change throughout the life course, and so do the benefits of nature connection. For example, children benefit from nature's endless opportunities for exploration, discovery, and active play; hospital patients find respite in the sense of life and vitality which they feel separated from indoors; older adults find meaningful connection with the natural world and other people through walking, gardening and socializing outdoors (Cooper Marcus & Sachs, 2014).

Designers can and should use research to maximize the health-promoting properties of outdoor spaces. Evidence-based design, or research-informed design, is especially important when the end user is from a vulnerable population. Older adults, as a population, share physical, cognitive and emotional challenges that can all be aided by nature engagement (Hall & Knuth, 2011). When the design for such engagement is sensitive, empathetic and evidence-based, outcomes for good health and well-being are optimized.

This thesis includes a literature review on the topic of healing gardens and other restorative landscapes, as well as on gardens specifically designed for older adults. In the Methods chapter, I will introduce the site, Friends House Retirement Community

(FHRC). I will discuss how site inventory and analysis, together with the literature review, provided a design program as well as goals and objectives for the landscape at FHRC. In the Results section, I will describe the proposed design, which includes a new Healing Garden in an area that was, until recently, filled with buildings; renovation of the Community Garden, an existing vegetable garden; and a series of connecting pathways, plantings and furnishings that bring the site's disparate elements together into a more unified whole. In the Discussion and Conclusion, I will tie my design back to the literature review, identify limitations to the project, and suggest potential opportunities for future research and design work.

## Chapter 2: Literature Review

### Important Definitions

To clarify the most common definitions used in the project, it is important to consider the following key words:

Healing Garden: The American Horticultural Therapy Association (AHTA) defines healing gardens as “plant dominated environments including green plants, flowers, water, and other aspects of nature. They are generally associated with hospitals and other healthcare settings, designated as healing gardens by the facility, accessible to all, and designed to have beneficial effects on most users” (Jellicoe, 1975, p. 1).

According to the University of Maryland Rehabilitation and Orthopedic Institute, a healing garden is a garden within a caregiving facility where visitors can “explore their personal needs” for relaxation, rejuvenation and meditation. Studies show a relationship between a patient's physical environment and their ability to manage pain and heal (2019).



Historically, gardens emphasized hospitality. Horowitz (2012) writes that in the 18th and 19th centuries, the need for hygiene during medical treatment increased. Changes included cross ventilation, access to sunlight and gardens (Horowitz, 2012). One of the advancements in the 20th century was the improved technology in medical sciences. According to the World Health Organization (2017), public green spaces can provide a wide range of health benefits including active lifestyle, mental wellbeing, hastening physical restoration, getting fresh air, and getting vitamin D.

Interaction with nature is the fundamental reason for choosing design features such as walking pathways, seating and gathering areas, gardens, and views to the borrowed landscape. Residents can enjoy walking, gardening, and relaxing physical activities such as yoga and Tai Chi.

Restorative Environment: In the current design, the term “restoration” means to simply sit and be, to feel better by being in harmony with nature. The connection between the three healing, community, and memorial gardens and the pathway that connects them to the building in this project is the restorative environment.

Community Gardening: It is important to consider the original use of the property of the Friends House. Historically, Quakers who were seeking a land to grow tobacco and corn. This tradition of farming is continued by the current community garden. So, modifying the community garden and adding some design elements to other parts of the site is according to the concept of adding healing and restorative spaces in the open space.

Universal Design Principles: The Universal Design Principles (UDP) is series of instructions to create the environment usable for all users. It includes guidelines and 7 principles to reduce the risk of unintended actions.

*The Restorative Benefits of Nature for All People*

Sachs (2019) posits that going outside a building to “get fresh air” or engaging with nature and wildlife is a restorative experience. Gonzalez and Kirkeloved (2013) argue that nature provides benefits through human experiences. They suggest that human can get “active and passive experiences” through interaction with nature and it is still true for modern word. (P.1), meaning that it is essential in human nature to be in touch with the natural environment. Zhang (2017) also discusses the concept that human nature is in harmony with the natural environment in terms of well-being and health: “...there are synergies between human health and natural environments based on, for example, demonstration of the greater health effects of being physically active in a natural environment compared with being physically active indoors” ( P.1).

The field of landscape architecture promotes human health and well-being in multiple ways by implementing design solutions that connect people with nature. Researchers and practitioners in this field believe, based on research as well as experience, that time spent outdoors and engaging with plants and other natural elements can increase physical, mental and social well-being (Hall & Knuth, 2019). Strayer states that “Nature can help heal people from different physical and mental issues. Spending time in nature can help us recover from stress, mental fatigue, and

negative feelings, allowing us to recharge and restore mental abilities in short term” (2012, p. 129).

According to Kabisch et al. (2019), engaging with green spaces and plants in both the native and improved landscape has a positive influence on many quality of life limitations, such as feelings of isolation, anxiety or depression. The authors also believe that time spent in nature can lead to “anxiety and stress reduction, attention deficit recovery, fractals and visual responses, decreased depression, enhanced memory retention, greater happiness and life satisfaction, mitigation of PTSD<sup>1</sup>, increased creativity, enhanced productivity and attention, reduced effects of dementia, and improved self-esteem” (Hall & Knuth, 2019, p. 30). In other words, nature assists us in feeling healthy and is an important tool for improving well-being. A study by Robbins (2020) has shown that spending even two hours per week in nature can significantly enhance a person’s physical health and mental well-being, including reducing blood pressure, anxiety and stress and improving mood and self-esteem.

Simply viewing vegetation can result in stress reduction and mental restoration. The amount of green space in residential areas, as well as access to a garden, are known to benefit mental health (Thompson et al., 2015). According to Thompson et al. (2015), there are three main behavioral mechanisms related to human interactions with the natural environment. These include physical activities such as walking in green space, the opportunity of frequent social contact with people while engaging with nature and seeking relaxing environments. Thompson et al. demonstrate that this engagement of people with nature and related activities

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<sup>1</sup> PTSD : Post traumatic stress disorder

“allow[s] them to recover from demanding situations and tasks, and natural environments are frequently sought for this purpose” (p. 1). This is part of the reason that nature is relaxing and enhances mental restoration. Active engagement with nature is also beneficial. According to Bravo (2015), in the field of therapeutic horticulture, “gardening provides a creative and stimulating activity to enrich the physical, mental, and social aspects of our lives” (p. 3).

In short, visual and physical exposure to and engagement with nature can provide us with a better state of mental health and personal awareness. As John Muir said, “Climb the mountains and get their good tidings. Nature’s peace will flow into you as sunshine flows into trees. The winds will blow their own freshness into you, and the storms their energy, while cares will drop away from you like the leaves of Autumn” (Mang, 1991, p. 3).

### *The Health Benefits of Nature Engagement for Older Adults*

It is critically important for older adults to access nature easily. Landscape architects must provide design services for all people regardless of their personal identity, status or ability. It is also important to design for the needs of specific populations, using the best available evidence. Elderly people, hospitalized patients, and other more vulnerable groups tend to spend less time outside than younger or healthier individuals (Cattan et al., 2005). In older adults, a decline in functional and/or cognitive abilities can be a factor in decreased outdoor engagement. Studies show that spending time in nature has significant positive effects on physical and mental health in older adults and social health (Colley et al., 2017; Kweon et al., 1998).

Because the elderly population is increasing, it is important to promote outdoor engagement for older adults (Wolf & Housley, 2016). Cooper Marcus and Sachs (2014) that “ten thousand Baby Boomers in the United States turn sixty-five every day” (p.1 29). The advantages of integrating senior facilities and nature are countless. For example, it can benefit the marketing of such facilities as seniors look to reduce costs of healthcare as they age. Residents are also looking for social support and engagement (Rifky et al., 2016). Researchers demonstrate that nature in forms of horticultural therapy, gardening activities, social contact in outdoor environments, or simply taking frequent walks in nature can benefit older adults in terms of their mental and physical health (Detweiler et al., 2012; Thompson et al., 2015). In a study of older adults, it has been acknowledged that higher longevity has been reported for those individuals that have access to nearby parks, tree-lined streets, and spaces for taking frequent walks, where they can also mingle and socialize (Eronen, 2014). Moreover, preliminary research on the use of therapeutic gardens for older adults suggests “...benefits of horticultural therapy and garden settings in reduction of pain, improvement in attention, lessening of stress, modulation of agitation, lowering doses of needed medications, antipsychotics, and reduction of falls” (Detweiler et al., 2012, p. 8).

Feelings of loneliness and isolation are a particularly salient health issue among older adults. Cattan and colleagues (2005) note, “Poor mental health, particularly depression, is known to be a major predictor of loneliness in old age” (2005, p. 42). In a study conducted by the University of California–Los Angeles, Cattan (2005) explains that loneliness is a frequently used term among older adults and that a feeling of isolation is common among aging groups. Engaging with nature,

however, can have the opposite effect; for example, interacting with nature as a part of group activities can motivate older people to be more socially active. Additionally, Wolf (2016) indicates that “older people have much to share and contribute in their communities. Ensuring their access to community green spaces, parks, and walkways provides a wealth of physical, mental, and social benefits that not only benefit each individual but also improves community quality of life” (p. 7).

Krause and Shaw (2000) argue that it is important to provide nearby natural settings for older adults as these can help them restore feelings that Krause describes as personal control and self-esteem. Engaging older people with outdoor physical activities, such as gardening, is one example of a social activity that can be a beneficial in reducing loneliness. A growing body of evidence supports the idea that access to natural environments can contribute to a better state of mental well-being through a number of meditative approaches and direct influence (Carrus et al., 2013).

Moreover, feelings of isolation can give way to feelings of self-awareness and self-esteem if enough outdoor amenities are provided to older populations to enable them to spend time in nature and enjoy social interaction. In assisted-living facilities, as Cooper Marcus and Sachs argue, “the sensitive placement of seating, tables, movable furniture, and planting can enhance the use of the outdoors for programmed social events, informal meetings with other residents or visiting family members, and getting away from what, for some, may be the pressures of congregational living or sharing a room with a stranger” (2014, p. 129).

Nature is also important for the physical health for older people. As Rodiek discusses, urban green spaces can, for example, reduce stress, improve moods, and

increase the level of physical activity, which in turn prevent cardiovascular diseases and mental disorders and reduce mortality among older adults (2014). Sunlight and fresh air also are critical. Sunlight enables the body to produce Vitamin D, which is important for bone strength. Cooper Marcus and Sachs (2014) state that daylight is effective, regardless of the amount of sunlight, in balancing circadian rhythms, “thus leading to better sleep patterns and up to a 70 percent reduction in the use of sleeping pills.” (p. 129).

### *Understanding Health Challenges for Older Adults Related to Interaction with Nature*

Several studies show promising ideas and suggestions for the design of safe, accessible outdoor spaces for older populations. However, to provide design guidelines that are functional for this group of people, it is also important to address the limitations that older adults face when accessing the outdoors (Cooper Marcus & Sachs, 2014). The elderly, often with various health conditions, are more vulnerable to the effects of high heat and humidity, since mobility limitations make it difficult for them to escape from heat and associated dangers, such as sunburn, in certain latitudes (Benmarhnia et al., 2015; Cooper Marcus & Sachs, 2014).

They also may encounter problems in their immune system from interaction with certain plants and pollen. In addition, loss of muscle mass and bone density, as well as having balance problems, can make older adults susceptible to falling. Other health-related factors such as reduction of eyesight and depression can impede older adults’ participation in outdoor activities (Letts et al., 2009).

Environmental conditions such as poor paving, insufficient lighting and inconsiderate pedestrians or cyclists can enhance fear of falling and other feelings of

insecurity, leading to a fear of going outdoors (Letts et al., 2009). This is why Cooper Marcus and Sachs emphasize “the great importance of having outdoor space that is easily accessible, safe to negotiate, and attractive to spend time in” (2014, p. 129). Other studies have highlighted the issue of entry doors that are hard to open or that prevent wheelchair use at that entrance. One study by Rodiek and colleagues of outdoor accessibility in assisted living facilities found that “where residents could easily cross the door threshold, residents spent on average of more than three hours a week outdoors, compared to facilities where this was not so” (Cooper Marcus & Sachs, 2014, p. 129). Rodiek (2005), in her study of assisted living facilities in Texas, reported that residents complained of several obstacles preventing them from spending time outdoors. Among them were doors being hard to open, insufficient outdoor seating and a lack of protection from the sun. As Rodiek and colleagues state in a later article: “Specifically, doors that are hard to open may undermine an individual’s sense of mastery and control over the environment and increase feelings of helplessness, insecurity, alienation, and dependence on others, while reducing satisfaction” (2014, p. 2).

Design guidelines for assisted living and skilled nursing facilities, released by the Center for Medicare and Medicaid Services (CMMS), provide standards for designing outdoor facilities for older populations. But the need for independent access to the outdoors needs to be considered. In many assisted living facilities, residents rely on staff to help them get outside (Bardenhagen, et al., 2017). In short, individuals need to have a sense of freedom in terms of their access to the outdoors.



Although most residents of Friends House Retirement Community do not have dementia, research on outdoor spaces for people with cognitive impairment and dementia provides important information for the most vulnerable of older garden users. In general, what benefits the most vulnerable users also benefits those who are more able-bodied (Cooper Marcus & Sachs, 2014).

*How Nature Can Play A Positive Role in Older Adults with Dementia*

According to Harvard Health Publishing, dementia is “a pattern of mental decline caused by different diseases or conditions” (Harvard Health, 2019, p. 1). Memory loss in older people is not necessarily a normal part of aging (Harvard Medical School, 2019). It should be noted that cognitive impairment (mild, moderate, and severe), dementia, and Alzheimer’s Disease are interrelated but different (Alzheimer’s Association, 2020). According to Alzheimer’s association, Alzheimer is the most common reason for dementia, Patients with Alzheimer’s have sever symptom’s such as disorientation, confusion and behavior changes, and they will show other symptoms such as problem swallowing and speaking in later phases. : “ Alzheimer’s is a degenerative brain disease that is caused by complex brain changes following cell damage. It leads to dementia symptoms that gradually worsen over time. The most common early symptom of Alzheimer’s is trouble remembering new information because the disease typically impacts the part of the brain associated with learning first” (www.alz.org).

Although there is no known cure for dementia, numerous treatments have been shown to reduce the pace of or prevent the disease (Calkins et al., 2007). People with dementia often suffer from a lack of ability to engage in social interactions or

meaningful and enjoyable activities. At the same time, participating in such activities can be beneficial. For instance, they can “generate instantaneous pleasure, increase dignity, activate memories, restore social roles and the building of relationships” (Gonzalez & Kirkevold, 2013, p. 2699).

Dementia in senior living facilities needs to be addressed for the design to benefit residents. Gardens in such facilities provide opportunities for exercise and socializing, as well as outdoor activities like gardening and filling bird feeders. These activities can benefit both residents and staff. Healing or restorative gardens allow individuals to experience nature, specifically plants and flowers, as well as fresh air. Gonzalez and Kirkevold insist that “the optimal garden design is when the garden offers the possibilities for restless individuals to wander in a safe and secure environment” (2008, p. 3).

People with dementia in assisted living facilities often rely on family and staff for safe outdoor visits. Even if they are allowed to go outside unattended, residents with dementia (and even those without dementia) might feel insecure or frightened about going outside (Cooper Marcus & Sachs, 2014). A fully enclosed garden, such as a courtyard garden, can be a solution to assist residents in safely enjoying the outdoors.

Engaging with nature can help restore people’s senses and cognitive ability, including improved memory retention of patients suffering from strokes and dementia (Detweiler & Warf, 2005). Activities such as gardening and landscaping have been shown to reduce incidents of aggressive behavior and improve cognitive capacity (Gigliotti & Jarrott, 2005). A study by Gonzalez and Marit (2013) found a

reduction in agitation among garden users with dementia in an assisted living facility. However, the same results did not appear for wheelchair users within the same facility, who spent less time in the garden due to a lack of access. After a more secure, accessible garden was established in the same facility, staff saw a 30% reduction in fall severity as well as a reduction in inappropriate use of certain medications among the same residents with dementia.

### *Residential Facilities for Older Adults*

The objective of this project is to design a restorative environment for senior residents at Friends House Retirement Community who might be vulnerable and/or experiencing isolation, dementia or a lack of physical abilities. An additional goal of the project is to draw attention to the design of senior residential facilities and demonstrate that integrating a facility with its natural setting brings benefits to residents. Even though aging often requires various specialized services, studies show that residential retirement and other senior facilities are often criticized for lack of attention, flexibility and services (Mitchell, 2020). Also, literature argues about the lack of facilities in retirement homes since they focus mainly on “illness” (Martinez et al., 2019), while there is a variety of appropriate attention that can be included in their design requirements. Access to nature can be a design feature that plays an important role in the health and well-being of older adults.

Due to an aging population, the need for retirement centers is growing, and the number of these facilities are increasing all over the U.S. to meet the demand. For example, the following map shows the number of retirement communities in the areas of

Silver Spring, College Park and Hyattsville, Maryland. There are at least 16 assisted living facilities in Montgomery County alone (Figure 1).

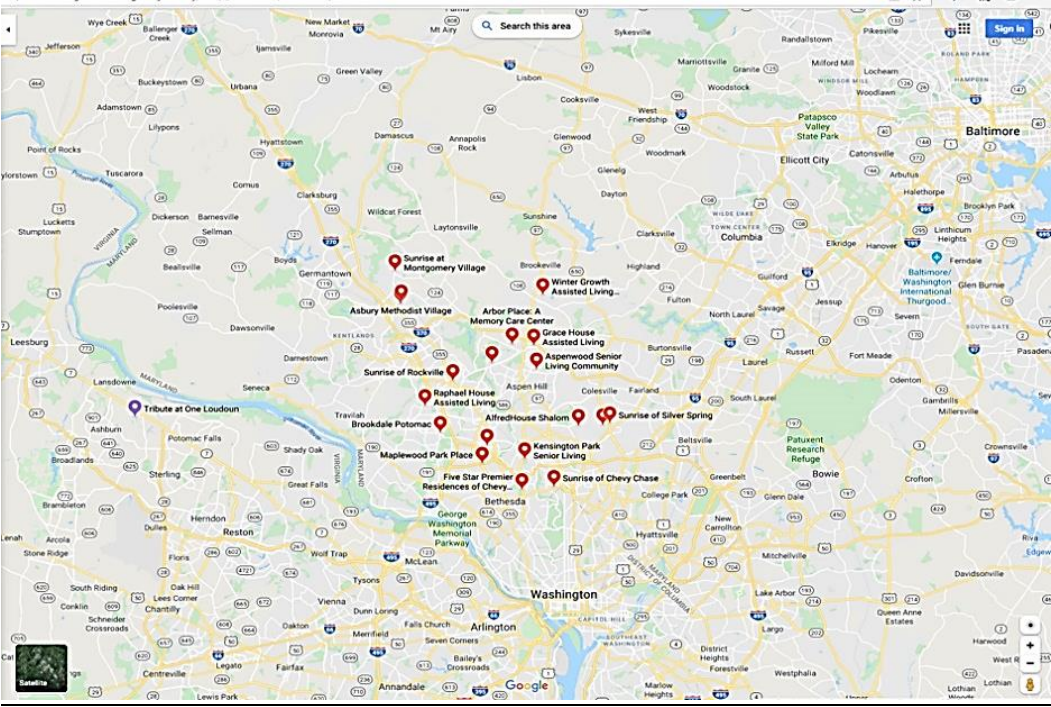


Figure 1 Assisted Living Facilities in Montgomery County- Google Maps

Root In Place: Adapting To New Life And New Atmosphere

Providing care for older adults is and will continue to be an unconventional challenge for healthcare systems around the world. For some older adults, it is simply not possible to live alone in one's home, nor is it feasible to ask their families to serve as the primary caregivers. Mitchell and Bryan state that "older adults with disabilities are likely to need long-term health care services to compensate for their functional impairments and help maintain psychosocial well-being. Residential care facilities or assisted living homes are one choice that can prevent or delay nursing home placement of disabled persons when in-home help is no longer sufficient" (2000, p. 117).

Choosing between staying at home and moving to an assisted-living facility can be a difficult decision. Roy et al. mention that, to date, many reasons have been provided for choosing to stay at home rather than moving into an assisted living-facility, including understanding the home as a mirror of the self—a place to experience personal control, physical and psychological security, physiological and physical comfort, and a familiar setting for attachment and memories (2013).

Gardens offer elderly residents who live in residential facilities the choice of leaving the building to go to a natural setting that has been designed to promote exercise and stimulate all their senses (Calkins et al., 2007). A garden—or gardens—in an assisted living facility, can fill some of the needs and opportunities that residents experienced in their own home. For instance, engaging the senses with a sensory garden, or creating a space for serenity, or gardening, or socializing with other residents can help individuals experience the satisfaction of settling into a caregiving facility (Cooper Marcus & Sachs, 2014).

## Chapter 3: Site Inventory and Analysis

One of the most important steps in the programming process is to understand every aspect of the site that is related to how people who live on the site, including people who are mobility impaired, can access the outdoors. The “site inventory” documents the current state of the site. The “analysis” interprets the inventory for what is possible and feasible for design.

### *Friends House Retirement Community*

The historic Friends House Retirement Community (FHRC), located in Sandy Spring, Maryland, provides direct service to seniors and, in particular, seniors with lower incomes ([www.bym-rsf.org](http://www.bym-rsf.org)). Residents of the retirement community have differing levels of physical ability. Many residents are fully mobile; they enjoy gardening, hiking on the trails, and other vigorous activities. Other residents are mobility-impaired and need extra assistance through canes, walkers, and wheeled mobility devices (wheelchairs and scooters) for getting from place to place . The existing pathways within the site do not provide opportunities for all residents to move freely in outdoor settings. Due to a development project that is underway on site, more residents will settle in the community. Their social and outdoor needs will require a structured plan for increased outdoor access. Figure 2 is an aerial view of the existing condition.

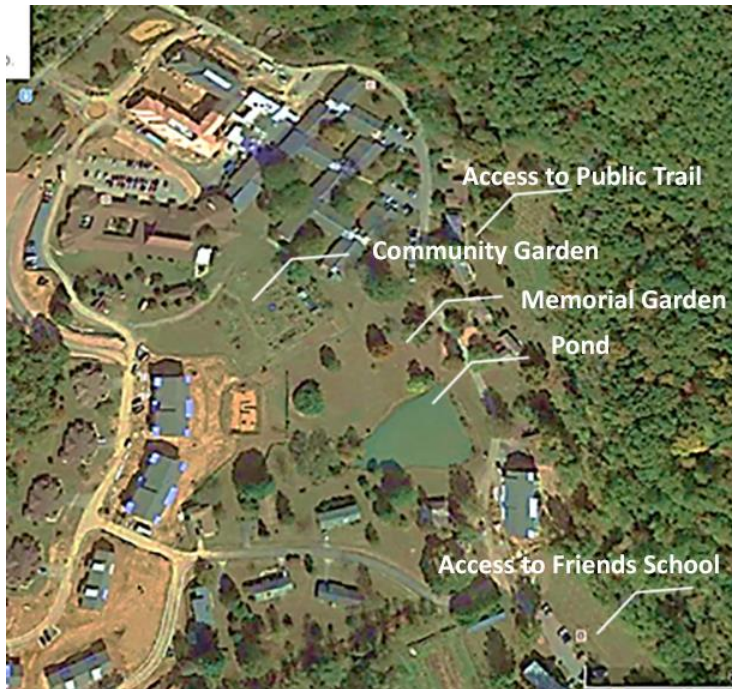
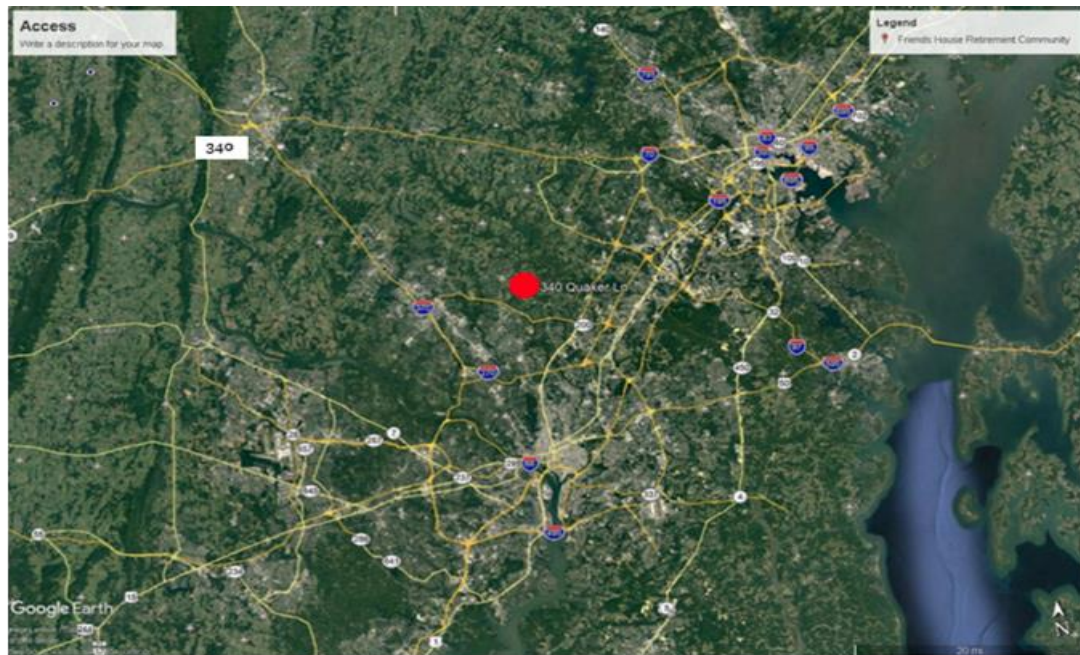


Figure 2. Friends House Retirement Community aerial view - Google earth 2020

Site selection



Site location in Maryland  
Google Earth

Figure 3. Site Location within state of Maryland- Google Earth

Friends House Retirement Community (17340 Quaker Ln, Sandy Spring, MD) is located close to the northeast border of Montgomery County in the Town of Sandy Spring, close to the southern border of Silver Spring, MD. This site is near the District of Columbia metropolitan area to the south and Baltimore to the north. It is approximately 48 miles from the Chesapeake Bay (Figure 3).

### Site Characteristics

The Friends House Retirement Community site includes 62 acres (**Error! Reference source not found.**) within a larger Community of Friends (142 acres). The site includes open fields, diverse vegetation and canopy cover, a pond, a community gardening facility, a memorial garden, and access to public trails and the Sandy Spring Friends School. The northern boundary of the site is near a single-family neighborhood, Friends School to the south, and privately-owned farms to the northwest (**Error! Reference source not found.**).

### Site History

The community was founded by Quakers who arrived in the early 18th century searching for land where they could grow tobacco and corn (Glaros, 2014). The Quakers built their meeting house as the place of worship for Friends in 1814 near a fresh-water spring that gave its name to the community (Canby, 1999). According to the Friends House website, due to former research done by the department of Landscape Architecture at the University of Maryland (2000) and Culture Spot at Montgomery county (culturespotmc.com), this Friends community is located at the historic site of Sandy Spring and was founded by George Fox in 1647.



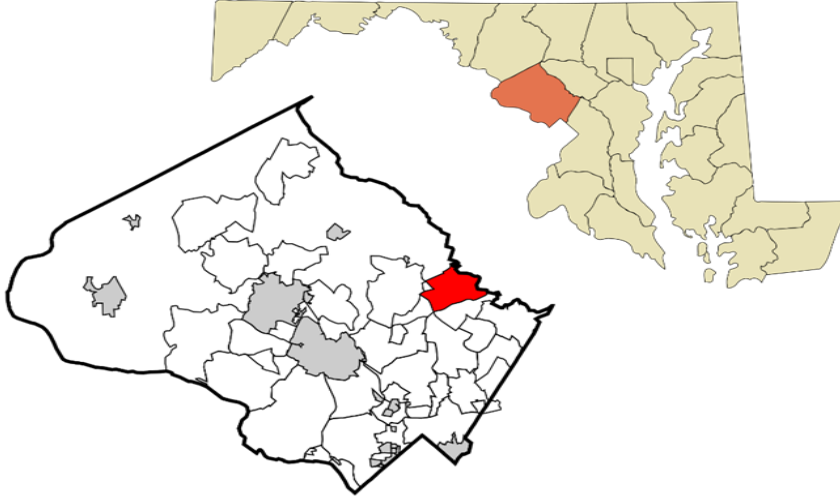


Figure 4. Site Property Line within community- Google Earth and the Parcel shape – GIS data

The location of the Meeting House in the village of Sandy Spring helped to define the limitation extent of the greater Sandy Spring neighborhood of the time. The greater Sandy Spring neighborhood includes Brookeville, Olney, Norbeck, Ednor, Brighton, and other communities within a six-mile radius of the meeting house (Glaros, 2014), (Figure 5).

Friends House Retirement Community is in its 52nd year as the only organization within Baltimore Yearly Meeting that provides direct service to seniors and particularly to seniors of lower incomes. Baltimore Yearly Meeting is a traditional yearly religious meeting for Quakers in the area of central Pennsylvania, Maryland, parts of West Virginia, Virginia, and the District of Columbia (<https://www.bym-rsf.org/>). As a precursor to the current role of the Friends community at Sandy Springs, in 1947 at a Friends Meeting House located at 13<sup>th</sup> and Irvine Street, a decision was made to establishing a nonprofit home for aged Friends in Washington, DC (culturespotmc.com). The first site for this started in Northwest Washington, DC in 1951 in an apartment building which was sold in 1952 due to lack of occupants. In 1954, one of the members of the Friends community, Esther Scott (**Error! Reference source not found.**), offered

her estate of 142 acres in Sandy Spring, to be used by the Friends community after her death.



[https://en.wikipedia.org/wiki/Sandy\\_Spring,\\_Maryland#/media/](https://en.wikipedia.org/wiki/Sandy_Spring,_Maryland#/media/)

Figure 5. Sandy Spring boundaries in Montgomery County



Figure 6. Preserved history on the site

<https://www.hmdb.org/PhotoFullSize.asp?PhotoID=385186>

The Circle of Friends decided to build the Friends House Retirement Community and High School in two separate buildings in 1959 by the Friends House Board of Trustees. This board also created a new corporation: Friends Community of the

Baltimore Yearly Meeting INC. In 1961 construction of the Retirement Community and Friends School Building was completed (Figure 10 and Figure 9). The school provides a variety of facilities and activities for the students (Figure 12 and Figure 13). Also, some activities and planned events are taking place at the Retirement Community such as game nights, music classes, etc.

The need for a gathering place such as a meeting house for worship was the initial interest for Quakers; building the school and retirement community for their community was another important part of the Sandy Springs Friends community. It is important, therefore, to keep the historic heritage of the site when redesigning it.



Figure 7. Baltimore Yearly Meeting signage. - <https://www.bym-rsf.org/>





<p align="center"><b>2020 WOMEN'S RETREAT REGISTRATION IS OPEN!</b></p>	<p align="center"><b>LOCAL MEETING SERVICES</b></p>
	
<p>Attention All Women of Baltimore Yearly Meeting - your presence is welcome at our annual women's retreat, February 7-9, 2020, just a few short months away. (Note: this is a different weekend than past retreats). Spend time relaxing, reconnecting, and restoring your joy with workshops, chanting, worship, long walks, and delicious meals. Diligence in Love, Overcoming Isolation is the theme. For more information and to register, go to: <a href="https://womensretreat.bym-rsf.net/">https://womensretreat.bym-rsf.net/</a></p>	<p>Information about services from the Yearly Meeting available for our local Meetings and worshipping communities is listed here.</p>
	

Figure 8. Friends Religious Events



Figure 9. Friends House Meeting Building today  
<https://www.culturespotmc.com/event/heritage-days-sandy-spring-friends-meeting-house/>



Figure 10. 1817 Friends House Meeting Building  
<https://www.sandyspring.org/history>

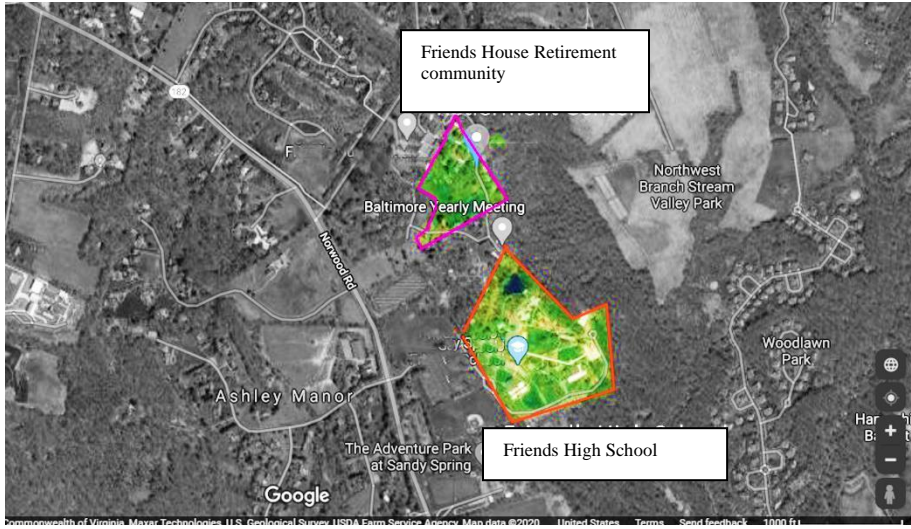


Figure 11. Site Location of Friends High School – Base map Google Earth



Figure 12. Some of the Friends High School facilities



Figure 13. Friends High School bus

## Zoning

The Montgomery County Land Use zoning map outlines land uses including: the land use for Planned Neighborhood, Residential, Residential and Commercial, Agricultural, Office (employment Zone), Government, Transportable Development, Rural, Planned Retirement Community and Industry (Figure 15). According to the Montgomery County Zoning Ordinance, the FHRC site ownership is considered private,

and by county land division is included in the zoning, Residential. FHRC is considered private and is in a Residential zone in an area that allows property development (Figure 16 and Figure 17).

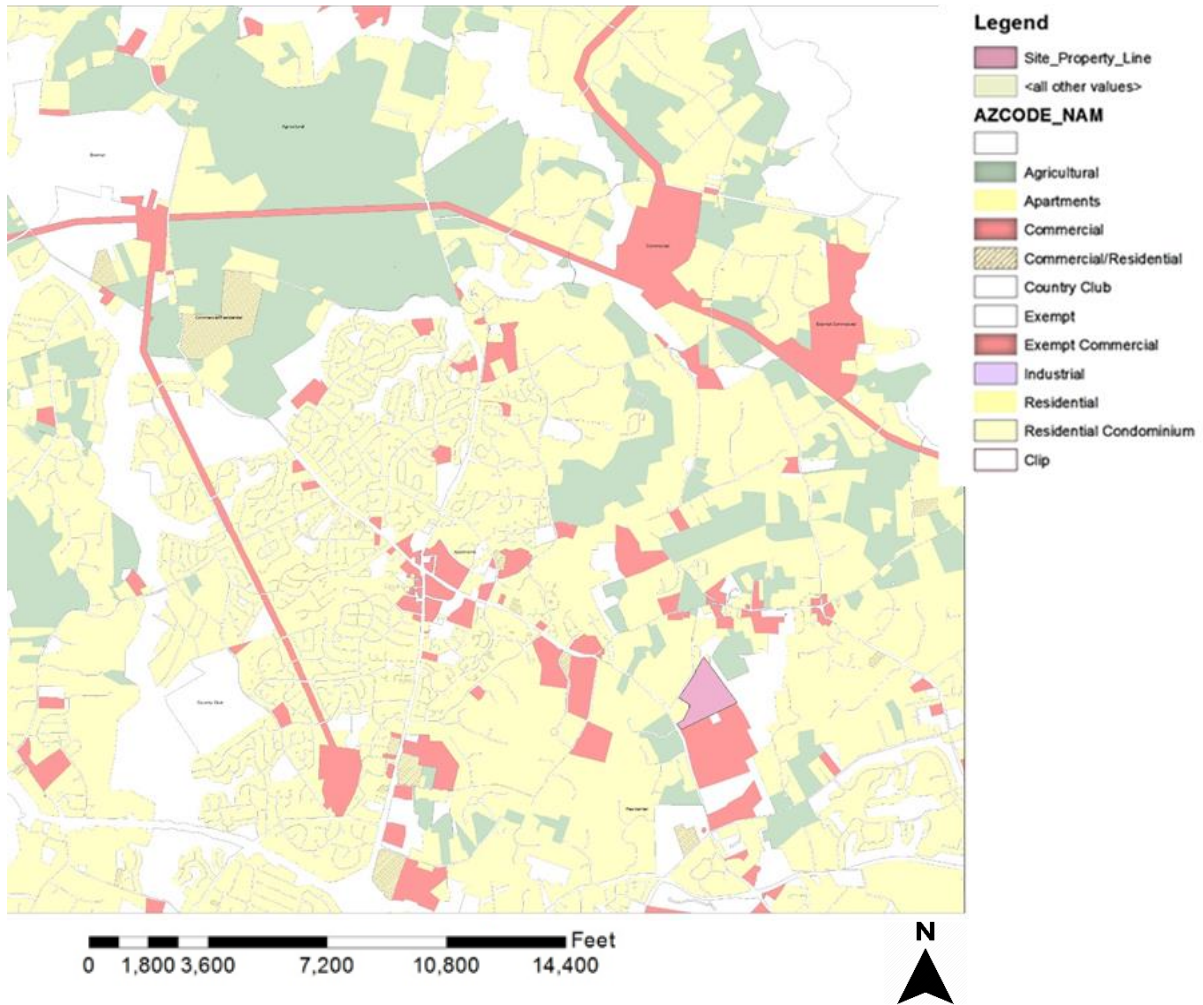
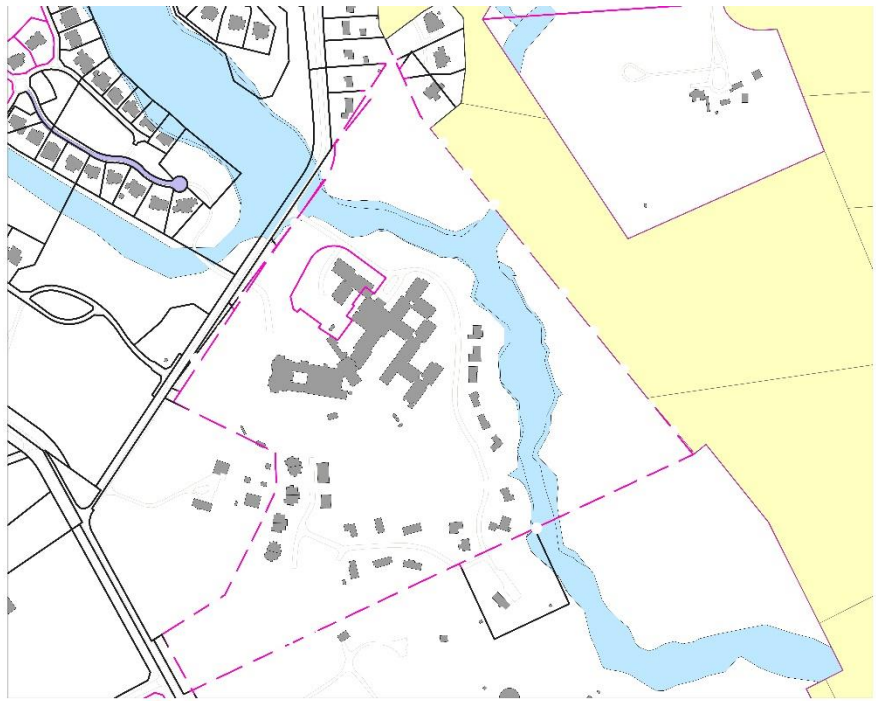


Figure 14. Zoning Map - Montgomery County Data - 2018



**Legend**

- countyland\_100813
- Private Property

**Public and Private Land**

1 inch = 200 feet

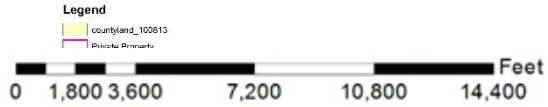


Figure 15. Property Ownership Map -  
Montgomery county data – 2018



## Site Conservation

In order to have a sustainable development, it is important to understand the environmental conservation considerations located on or near the selected site.

According to Montgomery County 2018, the conservation efforts within or near the selected site include a 100-year floodplain that is less than a mile from the site. For this site, forest conservation easements, also known as a conservation restrictions or conservation agreements, provide options to protect nature for future generations ([www.conservationeasement.us](http://www.conservationeasement.us)). Forest banks are also near the property line but are not located within the property (Figure 18). The Montgomery Planning Department (2018) states, “Forest banks are a necessary part of the forest conservation program. Normally development projects must plant or preserve forest onsite. When this is not possible, banks provide the opportunity to meet requirements in an off-site location within the County” ([montgomeryplanning.org](http://montgomeryplanning.org)).



Figure 16. Conservation Map - Arc GIS

## Development Program

According to FHRC's executive director, a development project has begun for Friends House with the goal of building more senior housing, including two-story cottages and lodges, that allow more residents into the community (Figure 18). The development program is a combination of affordable housing, rental units, assisted living, skilled nursing, and common renovation and additions (Figure 19). Some older buildings are being demolished and new buildings are being constructed with better infrastructure. Another goal for the development project is to create more flat open space for the Friends House community.

Increasing the number of residents can lead to more caregiving staff job opportunities at the retirement community as well as creating a larger community with more activities and experiences. However, there are drawbacks that this development program has introduced. For example, according to the residents, the building construction has had damaging effect on some of the greenery of the site.

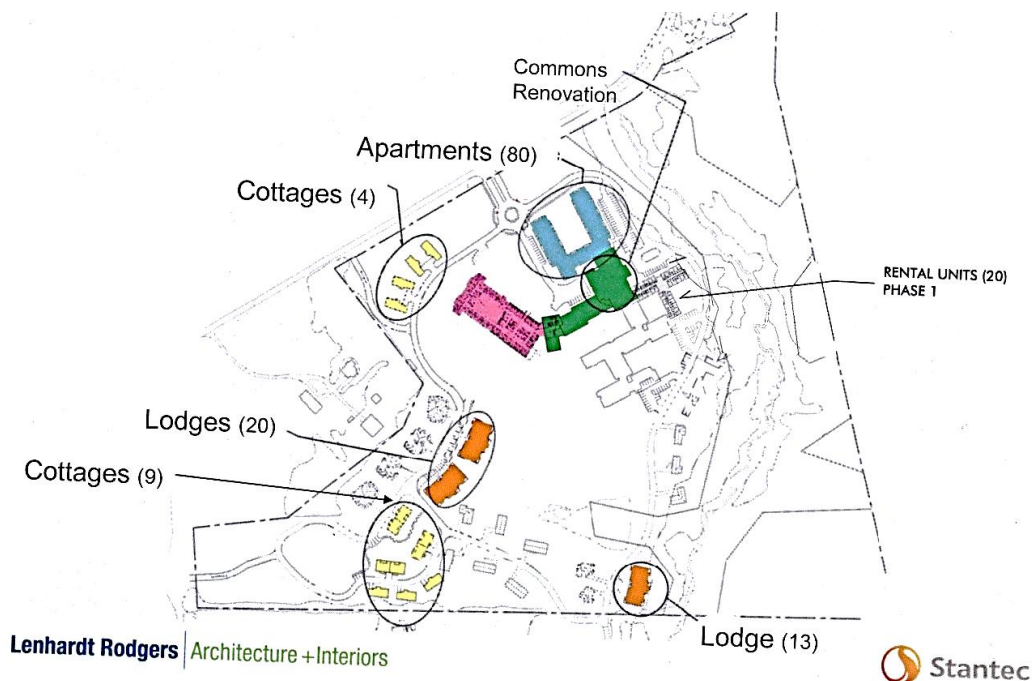


Figure 17. plan for development program, <http://www.friendshouse.com>

According to the development plan, two wings (C and D) of the main retirement community building have been demolished, leaving a flat area beside the main parking lot and the remaining building. During the construction, two mature trees in this space were preserved (Figure 19).

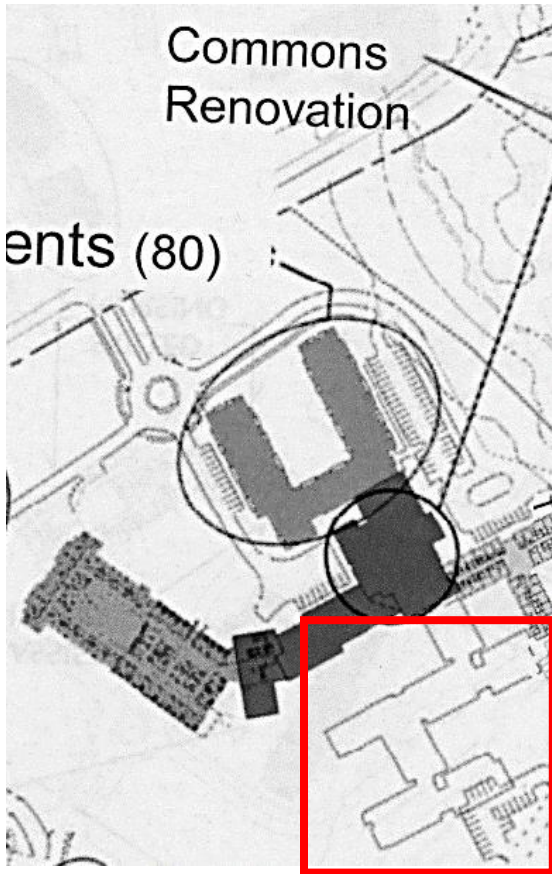


Figure 18. Wings D and C were demolished to create more outdoor space  
Friends House executive director

### Vegetation

A noteworthy variety of plant species exists on the site. More than half of the site is filled with trees, lawn and shrubs. Many tree and shrub species were planted in the 1970s (Walker, 1996), (**Error! Reference source not found.**). According to the original Friends House Significant Tree map (Figure 22), the cultivated tree species on site are American Sycamore, Black Gum, Catalpa, Chinese Chestnut, Copper Beech, Dawn

Redwood, Dogwood, European Linden, European Beech, Fringe Tree, Japanese Maple, Redbud, Sourwood, Tulip Poplar, Weeping Cherry, White Pine, White Oak, Willow Oak, Wye Oak, and Yellow Wood. The Franklin tree and some other vegetation was damaged and died due to the recent construction. An invasive species of bamboo has been growing on the site beside the pond. According to Master Gardeners, the bamboo canes are used for the Community Garden, so the residents have managed to prune and keep it contained (Figure 23).

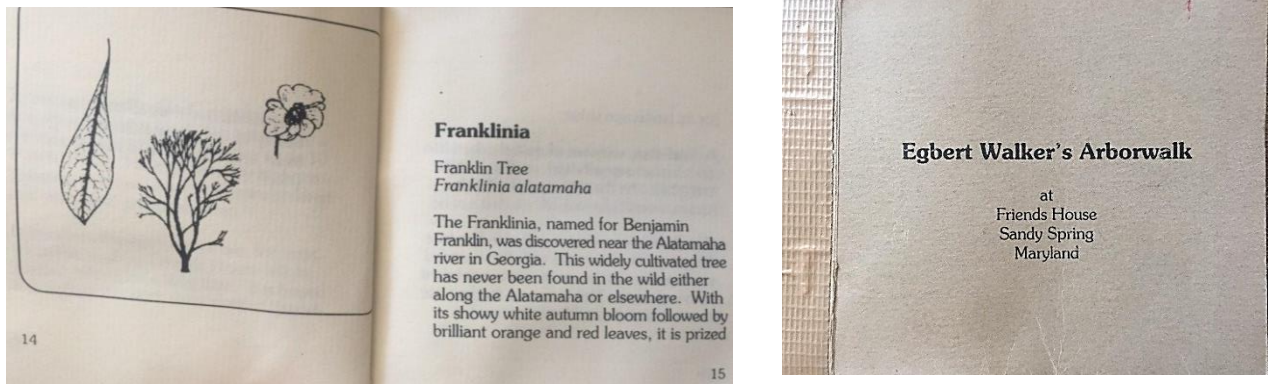


Figure 19. The existence of Franklin tree has been indicated in Egbert's Arbor walk, Egbert Walker's Arborwalk-1996



Figure 20. American Sycamore and Cypress species on site, April 2019

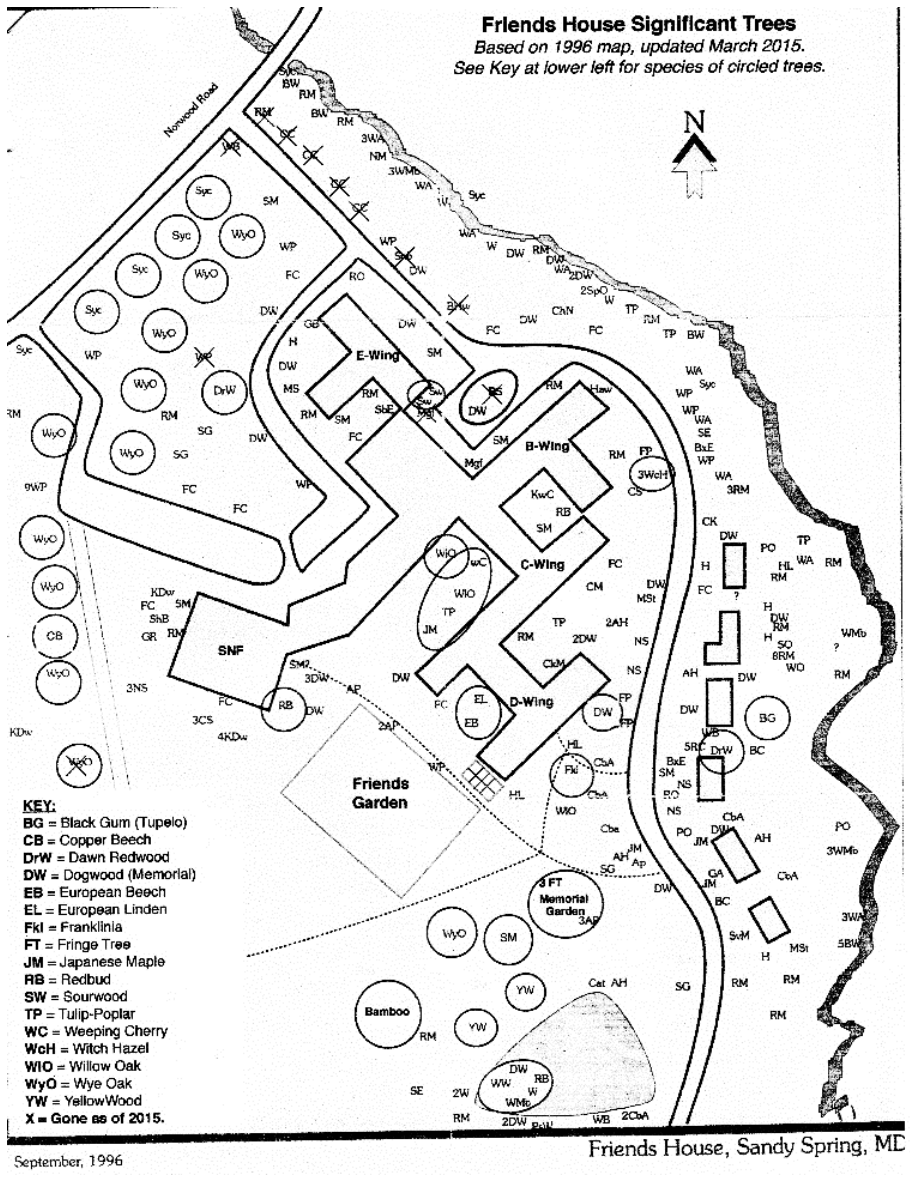


Figure 21. Friends House Significant Trees map - Montgomery County Data resource 2018

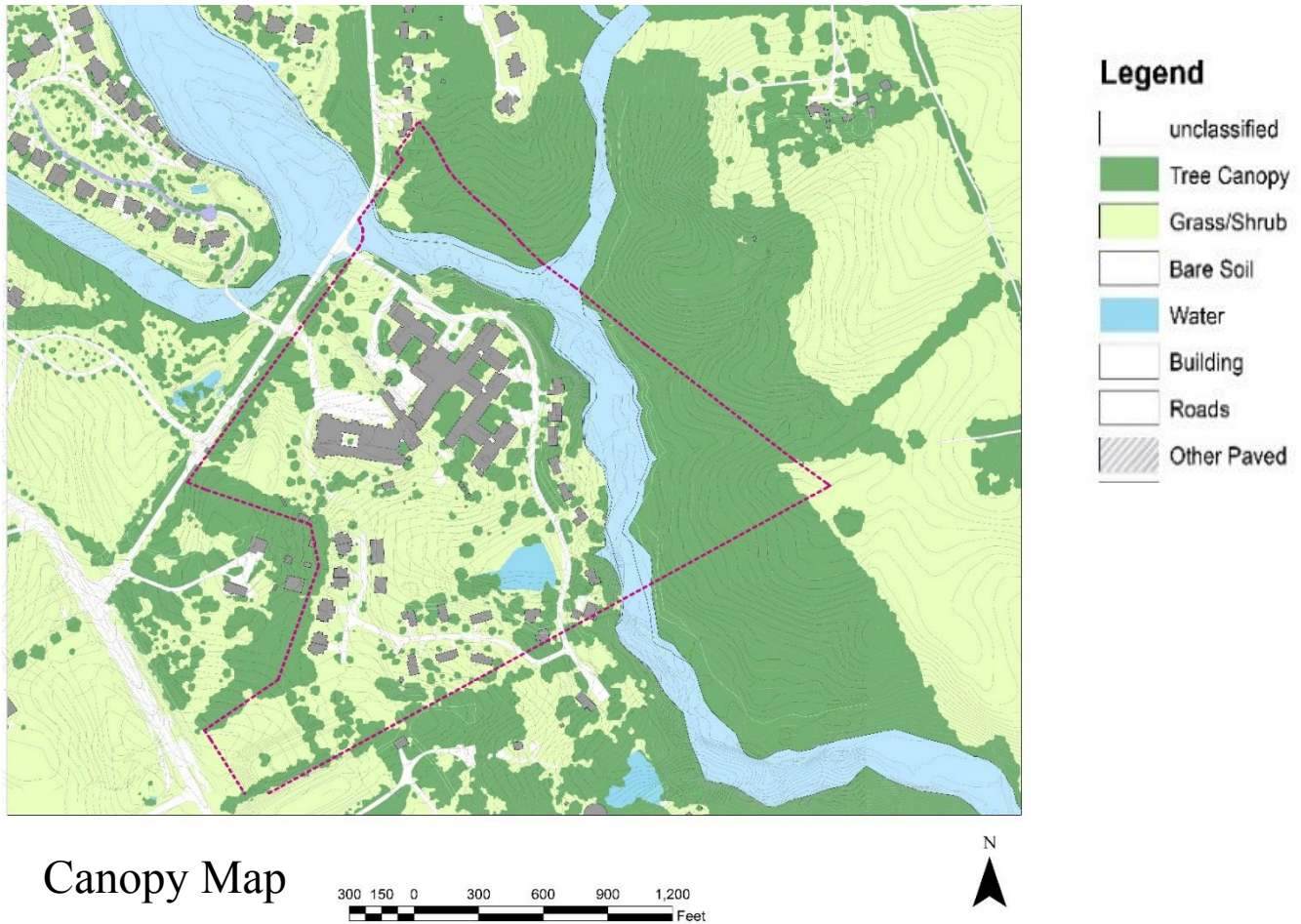


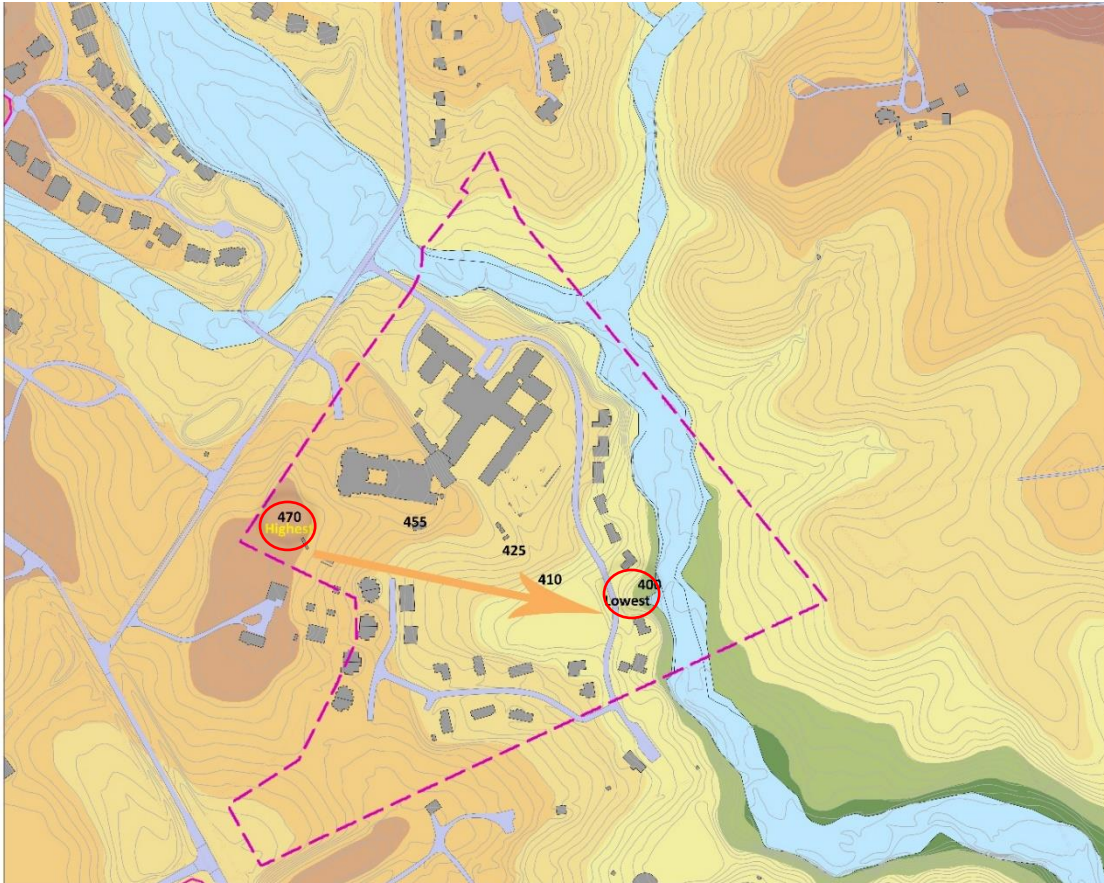
Figure 22. Canopy map, Montgomery County Data resource 2018

*Elevation, Slope and Aspect*

The elevation change within the site is more than 70 feet. The highest elevation is 470 feet and the lowest elevation 400 feet beside the constructed stormwater management pond (Figure 24). The least steep area, with a slope between 0 and 3 percent, is in between Wing B of the main retirement center building and the parking lot. The steepest slope, between 10 and 14 percent, is along the path between the Community Garden and the pond area. This steepness needs to be considered for

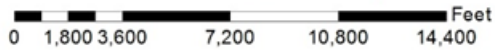
grading to make the pathway more accessible (Figure 25). Most of the slope orientation (aspect) of the site is toward the Southeast, East and Northwest (Figure 26).

The Community Garden is located at the southeast part of the site with a southeast orientation.



Elevation Map

1 inch = 200 feet



Elevation Map

1 inch = 200 feet

**Legend**

topo_raster_2 <VALUE>
379.8911133 - 400
400.0000001 - 410
410.0000001 - 425
425.0000001 - 440
440.0000001 - 455
455.0000001 - 470
470.0000001 - 485
485.0000001 - 500
500.0000001 - 515

- Highest Elevation: 470 feet
- Lowest Elevation: 400 feet

Figure 23. Elevation map - Montgomery County database



0 450 900 1,800 2,700 3,600 Feet



**Legend**

2 Feet Contour

**Slope (Percentage)**

<VALUE>








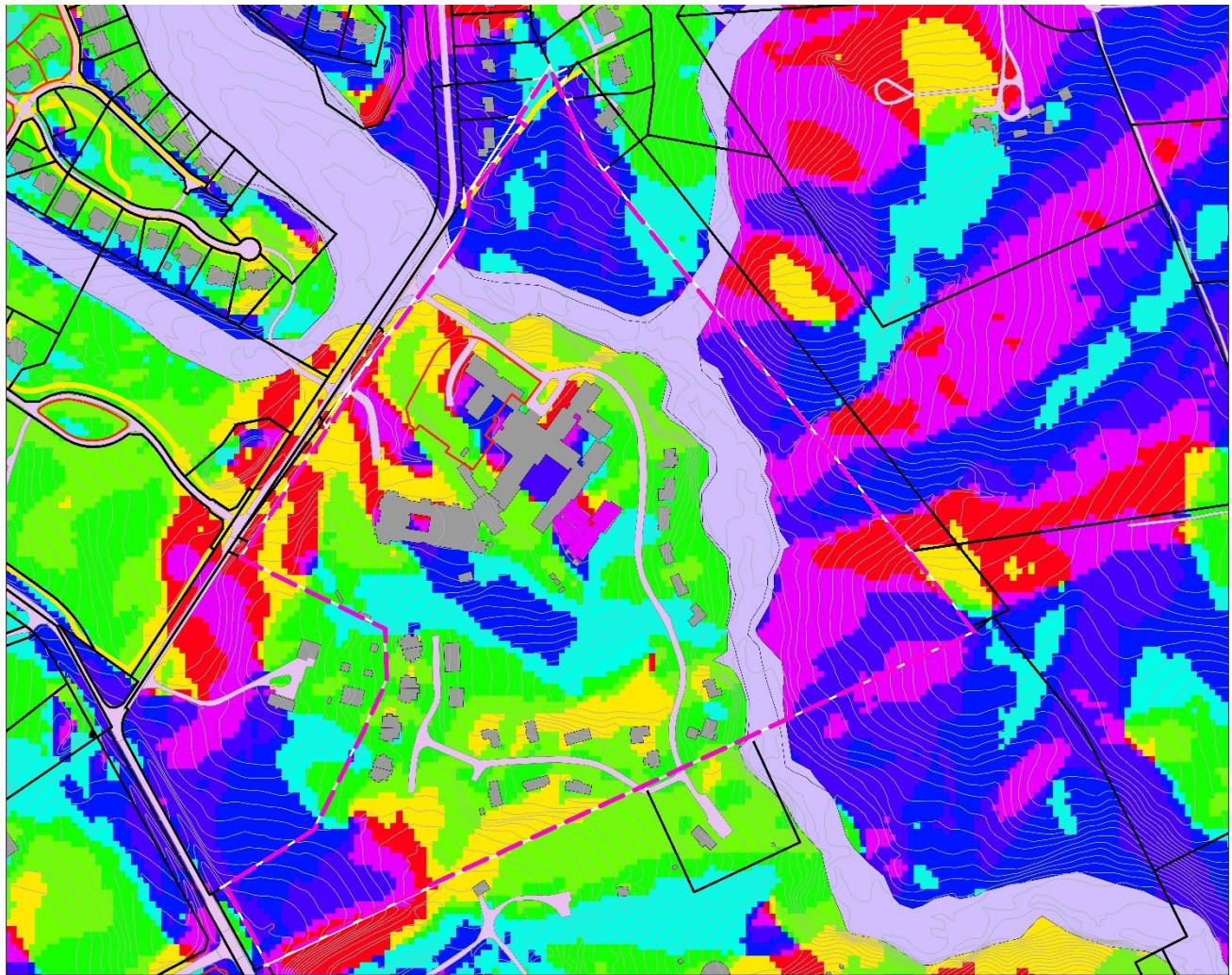
	0.003190191 - 3.0286333
	3.028633301 - 5.396371384
	5.396371385 - 7.764109469
	7.76410947 - 10.52647057
	10.52647058 - 14.3411597
	14.34115971 - 19.8658819
	19.86588191 - 33.54614639

Figure 24. Slope Map- Montgomery County Database- 2018





0 450 900 1,800 2,700 3,600 Feet

**Legend**

- 2 Feet Contour
- Flat (-1)
- North (0-22.5)
- Northeast (22.5-67.5)
- East (67.5-112.5)
- Southeast (112.5-157.5)
- South (157.5-202.5)
- Southwest (202.5-247.5)
- West (247.5-292.5)
- Northwest (292.5-337.5)
- North (337.5-360)

Figure 25. Aspect Maps - Montgomery county database

Watershed

The site is within two subdivisions of the Anacostia Watershed, which meets with Rocky Gorge Watershed on the northern border line (Figure 2627 and Figure 2930).

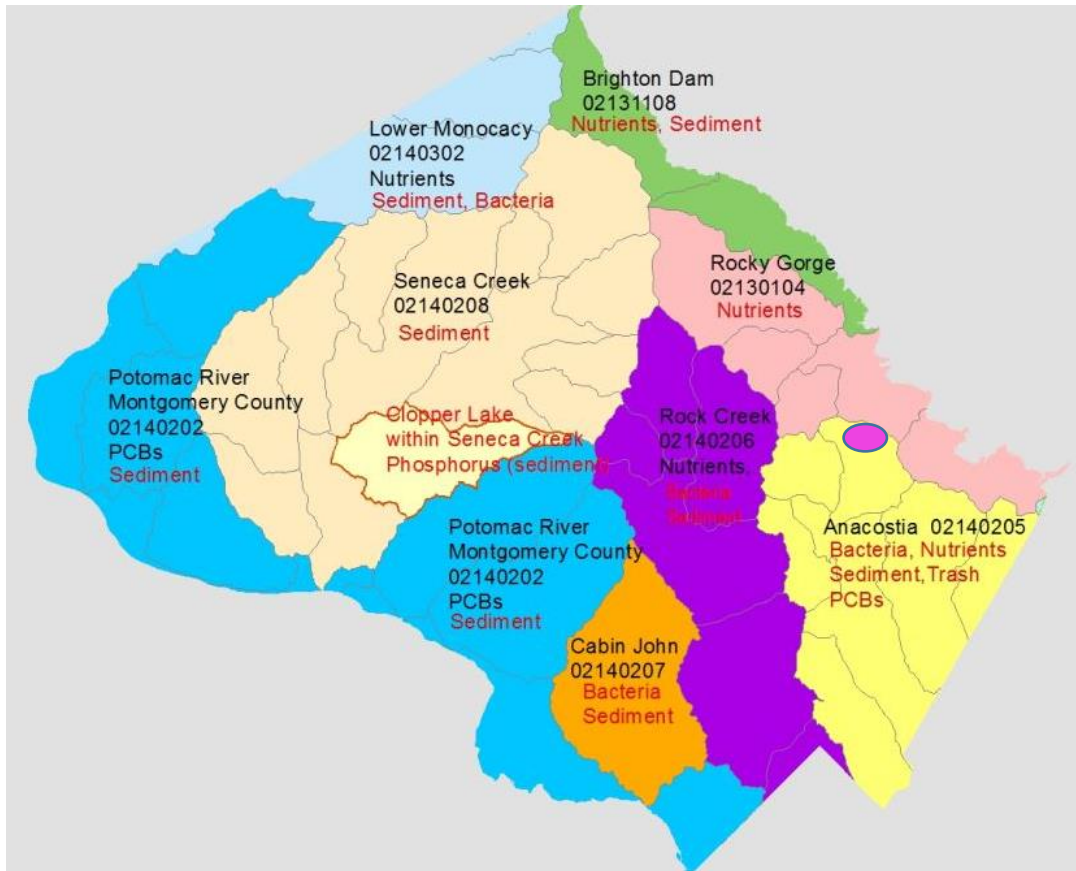


Figure 26. County Watersheds on Maryland – January 2013

● Site Location



Figure 28, illustrates one of the streams at the southern side of the single-family houses.

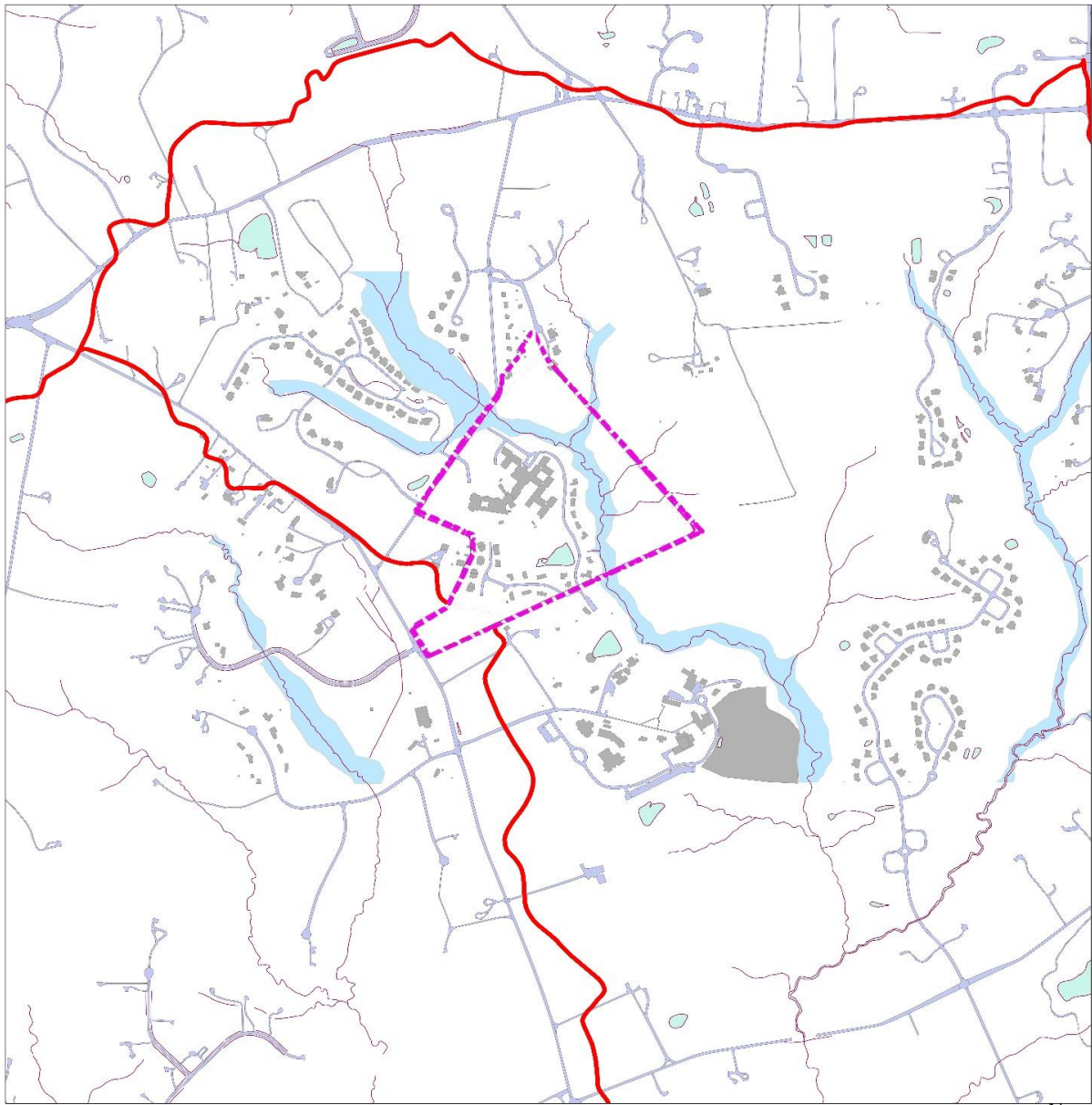
This stream is one of the branches that connects to the Anacostia Watershed that collects

*Figure 27. One branch of a stream inside the forest behind the single-family houses, flowing toward the Anacostia River*

the excess waterflow from the site. So, it is important to collect and filter the runoff water before it enters the stream and watershed.

#### *Hydrology and Drainage Pattern*

Most of the hydrology pattern within the site follows the initial stormwater management infrastructure plan and the stormwater management pond, located at the northern side of the property. However, before running toward the pond, runoff flows across the site over the pathways and lawns. Over time, the water has caused damage to the walking pathways and regularly creates muddy areas in and around the Community Garden (Figure 3031 and Figure 3132). The 500-year flood plain is near the property line. The flood plain has a rich tree canopy and wildlife habitat. It is important to prevent future development along the north – south axis of the site due to this existing flood plain.



0 450 900 1,800 2,700 3,600 Feet

# Watershed and Hydrology map

- Legend**
- Watershed boundary Line
  - hydro\_arc
  - hydrology
  - Flood plain clip

Figure 28. Watershed map - Montgomery County database

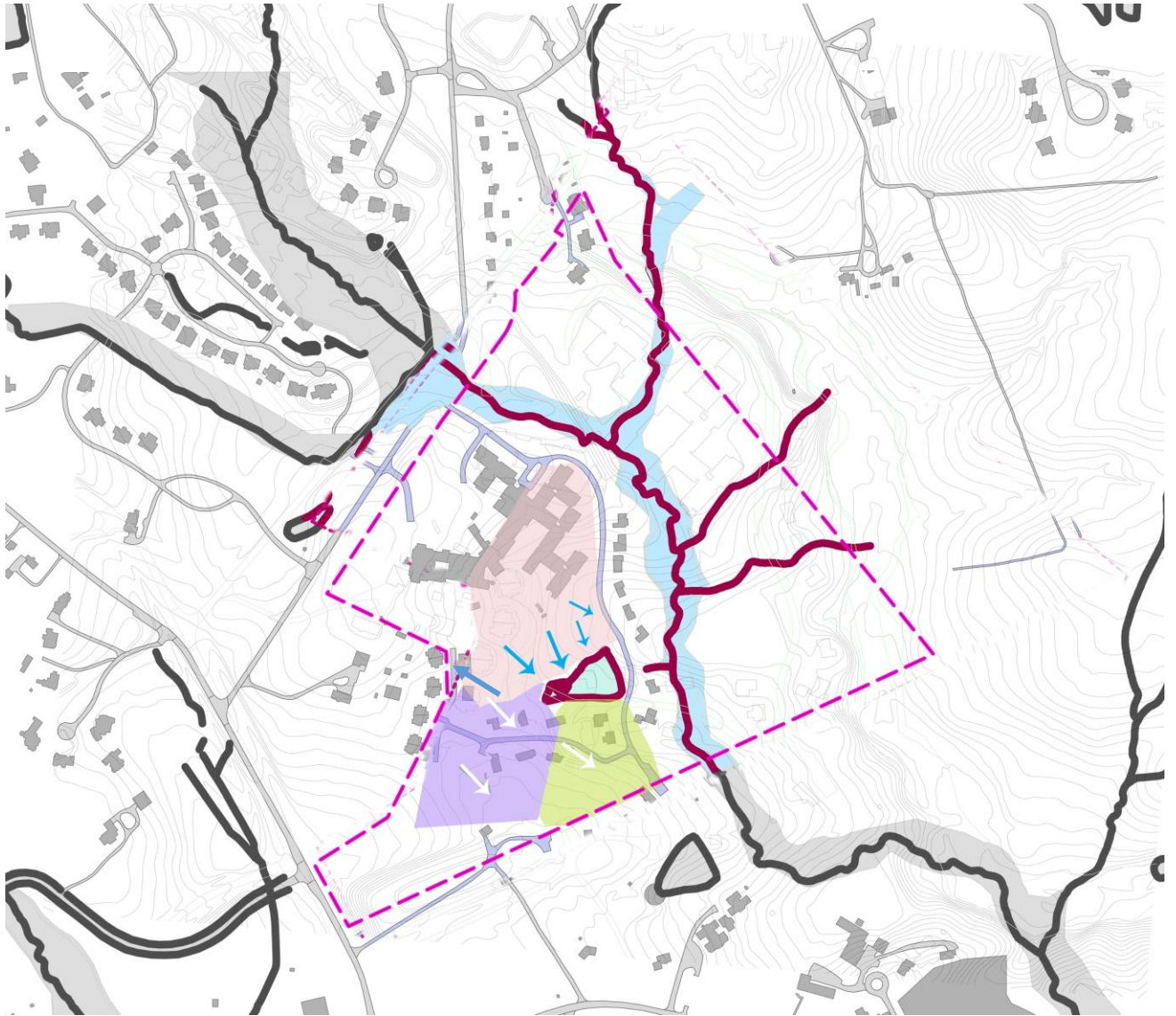


Figure 29. Hydrology Pattern within the site



*Figure 30. Damage that runoff has caused along the walking paths*



*Figure 31. Muddy areas around the community garden that is the result of insufficient stormwater management strategies*

### Soil Analysis

According to Natural Resources Conservation Services (NRCS) soil data, the dominant soil of the site is Glenelg silt loam, with 39.6 acres of the site and 84.8 percent of the total area. The least dominant soil is Baitt silt loam with 1.6 acres and 3.3 percent of the area and Hatboro silt loam with 4.8 acres and 10.3 percent of the total area (Figure 33). According to hydrological soil group, the soil is within group B which has a

moderate infiltration rate and moderately coarse texture ([www.engineering.perdue.edu](http://www.engineering.perdue.edu)). Knowing the soil characteristics is helpful for decision making for the stormwater management strategies and modifications. Also, soil data is useful for a successful and sustainable landscape design for appropriate installations and plantings.

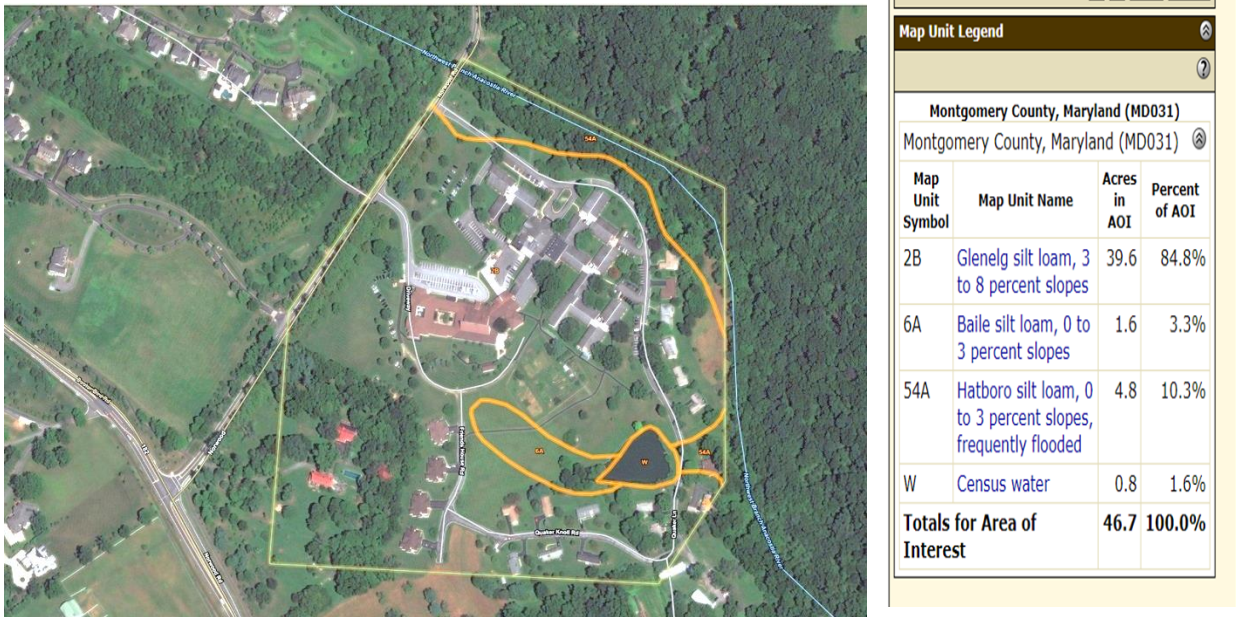


Figure 32. Soil - Soil Survey website

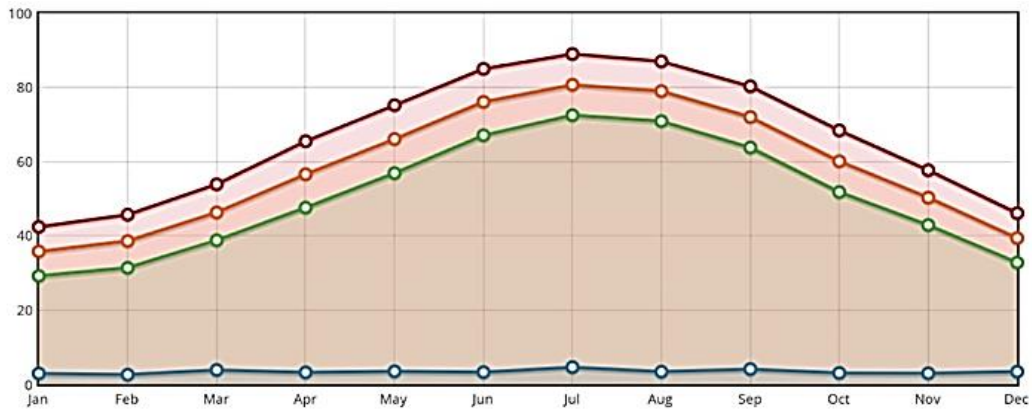
### Climate

Climate analysis is an important component of any site inventory and analysis, but perhaps even more so for the current project, where the main users are older adults who tend to be more sensitive to temperature and humidity levels. Data tool 1981–2010. in winter is from December to February, with the minimum temperature ranging from 25 to 47.6 degrees Fahrenheit. Annual rainfall on the site is estimated at 40.39 inches Figure 34 Figure 36). The site occasionally gets snow during winter (Figure 35).

Normal – Maryland is the main data to analyze the temperature and percentage of annual and monthly participation. According to this data, the months of June to



Figure 34. Winter at the Friends House open space – view toward Stormwater management pond



MONTH	● PRECIP (IN)	● MIN TMP (°F)	● AVG TMP (°F)	● MAX TMP (°F)
01	2.92	29.2	35.8	42.4
02	2.60	31.4	38.6	45.7
03	3.86	38.8	46.3	53.9
04	3.22	47.6	56.6	65.5

Figure 33. Monthly Precipitation and temperature at the site - <https://www.noaa.gov/>



August have the highest temperatures, between 65.7- and 85-degrees Fahrenheit. The lowest temperature

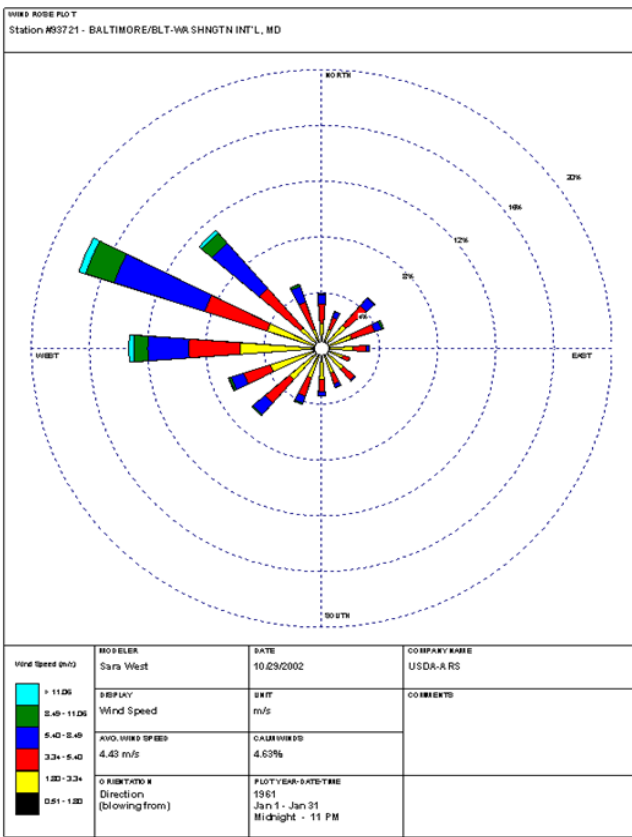
SEASON	● PRECIP (IN)	● MIN TMP (°F)	● AVG TMP (°F)	● MAX TMP (°F)
Annual	40.89	50.6	58.5	66.5
Winter	8.93	31.1	37.9	44.7
Summer	11.28	70.2	78.6	87.0
Spring	10.57	47.8	56.3	64.9
Autumn	10.11	52.8	60.8	68.8

Figure 35. Seasonal Precipitation and tempreature- <https://www.noaa.gov/>

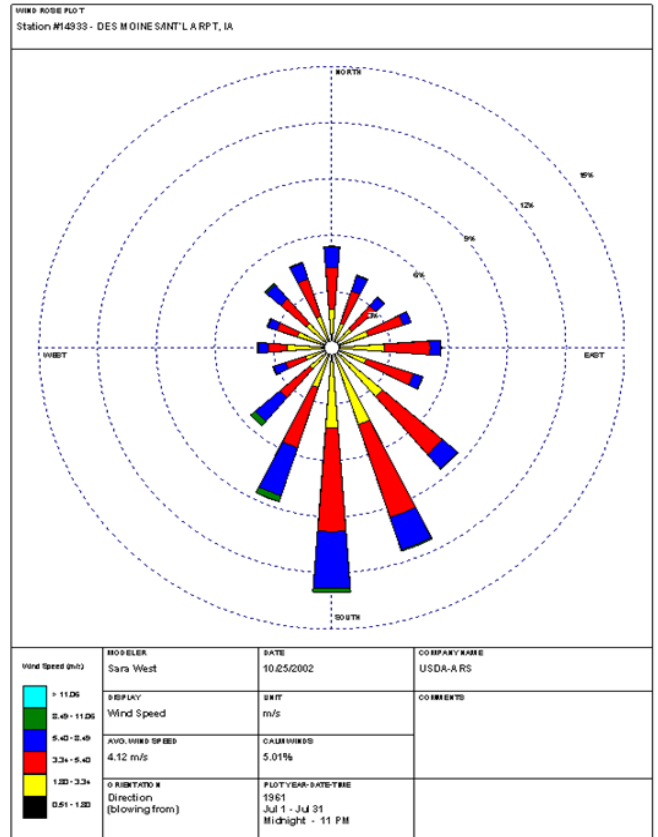
### Wind Rose Plot

A wind rose is a type of circular plot that exhibits the prevalence of wind directions at a given location (Figure 37). The wind rose displayed below was generated from data collected at the closest station to the site, in Baltimore, MD, from 1996 to 2003. The average wind speed is 4.43 miles per hour (mph) from 0 percent to 4.63 percent of the time. In this example the strongest winds occurred in the west, blowing at a rate of 11.03 plus mph (<http://mapsofwonderland.blogspot.com/>).

As explained before, since the main users of the site should be protected from sever whether condition, this data is valuable to clarify the areas on the site that are mostly affected by cold and wind. The design must consider where to best locate places for people to comfortably gather, sit or take walks.



January



July

Figure 36. Summer and Winter Wind Rose - <https://www.wcc.nrcs.usda.gov/climate/windrose.html>

### Plant Hardiness

In order to have a sustainable design, it is vital to use the right plants for the climate. A plant hardiness map helps to understand the plants that can best tolerate the weather and temperature conditions within the site. According to the USDA, Friends House is located within Zones 5 to 7 (Figure 39), where the minimum and maximum temperatures are between 29.2 F and 87 F. It should be noted that with climate change, hardiness zones are changing. According to the USDA, due to climate change, the United States has been experiencing warmer days. The state of Maryland is no exception. illustrates the zone change in the past 10 years and the projected next 30 years. This has a direct impact on correctly selecting vegetation for planting.

## Maryland Hardiness Zones

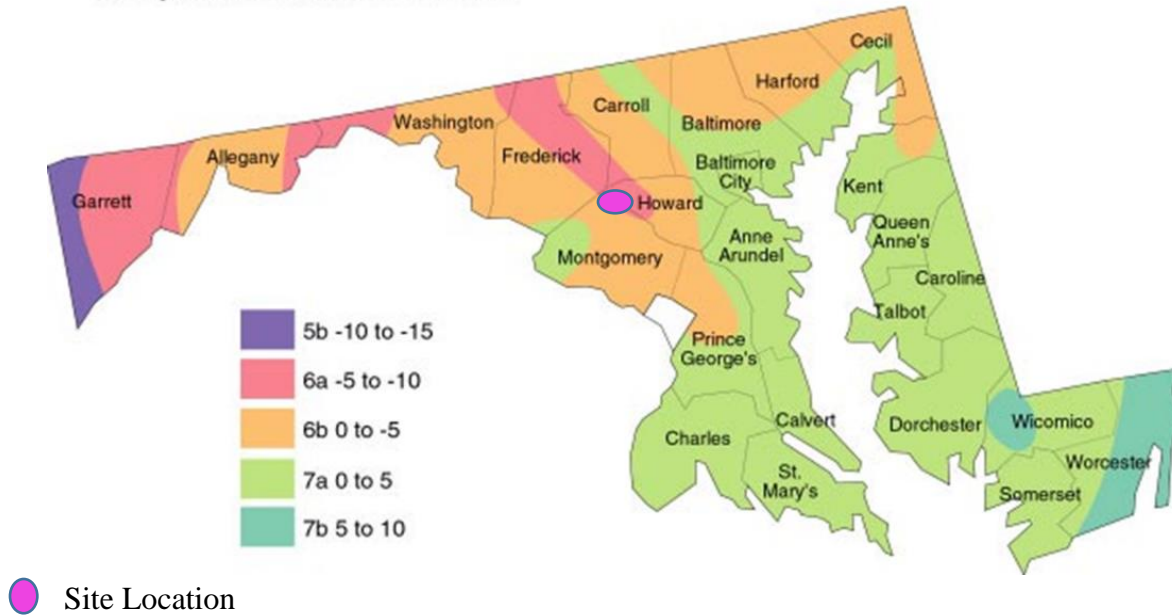


Figure 38 Plant Hardiness within the site - USDA

## Shift in Plant Hardiness Zones

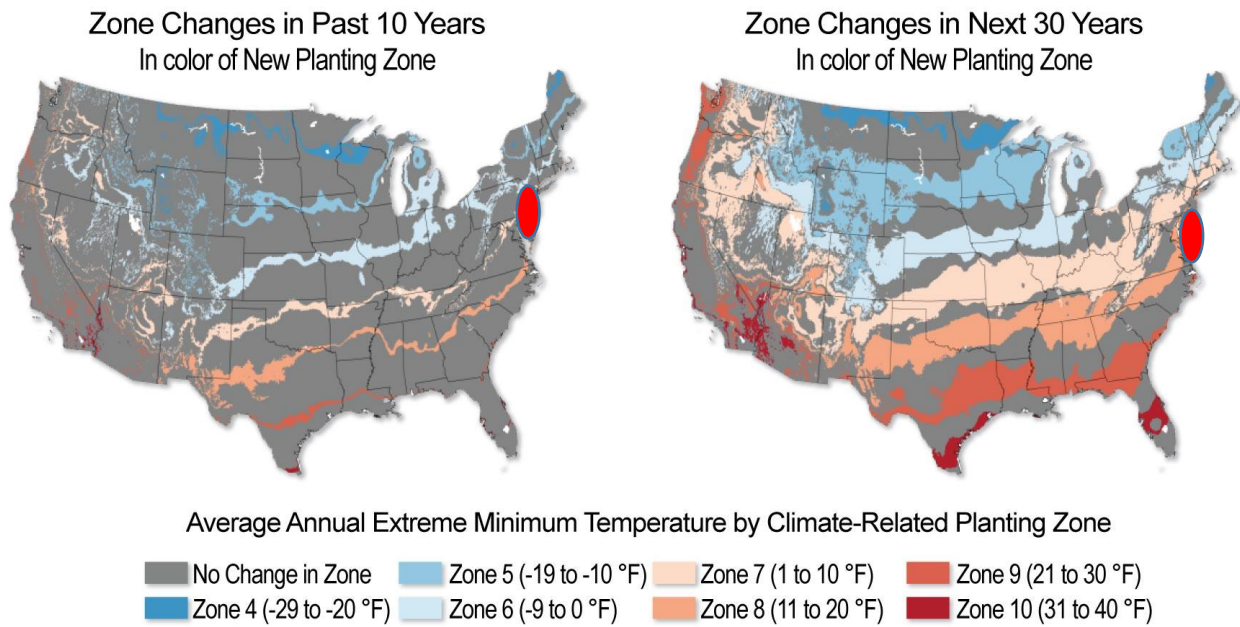


Figure 37. Plant Hardiness Zones changes in the last 10 years and the expectations for the next 30 years



State of Maryland

<https://nca2014.globalchange.gov/report/appendices/climate-science-supplement/graphics/shifts-plant-hardiness-zones>

### Wildlife and Bird Habitat

For a sustainable design, it is important to understand the existing variety of wildlife habitat in order to have the smallest possible impact. Animals reported as living in the area by Friends residents and by the the Montgomery County Animal and Science Adaptation Center include bats, bears, coyotes, Canada geese, deer, foxes, raccoons, skunks, squirrels, and woodchucks (groundhogs). According to Montgomery County, some of the last sighted bird species are American redstart, European starling, cattle egret, sparrow, , Savannah sparrow, turkey vulture, warbler (Parulidae sp.), and green heron (Figure 4243). Bird-watching has an important role in the current outdoor life of the Friends House residents. Several bird feeding stations were observed in site visits ( **Error! Reference source not found. Error! Reference source not found.**).



Figure 41. Fox, one of the existing wildlife species of the area - <https://www.montgomerycountymd.gov/animalservice>



Figure 40 and .Bird nest and feeding boxes at the site



Figure 39. Nesting Box

# 330 Species | 108,263 Checklists

Updated ~10 hr(s) ago.

Last Seen First Seen High Counts Bar Charts [Show All Details](#)

	SPECIES NAME	COUNT	DATE	BY
1	Great Horned Owl	1	25 Oct 2019	David Kidwell
2	Mourning Dove	2	25 Oct 2019	Max Wilson
3	Red-bellied Woodpecker	7	25 Oct 2019	Max Wilson
4	Downy Woodpecker	2	25 Oct 2019	Max Wilson
5	Northern Flicker	1	25 Oct 2019	Max Wilson
6	Carolina Wren	2	25 Oct 2019	Max Wilson
7	European Starling	300	25 Oct 2019	Max Wilson
8	Gray Catbird	1	25 Oct 2019	Max Wilson
9	American Robin	1	25 Oct 2019	Max Wilson
10	White-throated Sparrow	7	25 Oct 2019	Max Wilson



## Recent Visits

Checklists submitted within the last hour are not shown.

OBSERVER	DATE	SPECIES
Max Wilson	26 Oct 2019	
David Roberts	26 Oct 2019	
Ryan Webb	26 Oct 2019	
Ryan Douglas	26 Oct 2019	
Jodi Bucknam	26 Oct 2019	
Max Wilson	26 Oct 2019	
Max Wilson	26 Oct 2019	
Ed Vigezzi	26 Oct 2019	
David Roberts	26 Oct 2019	
Scott Baron	26 Oct 2019	

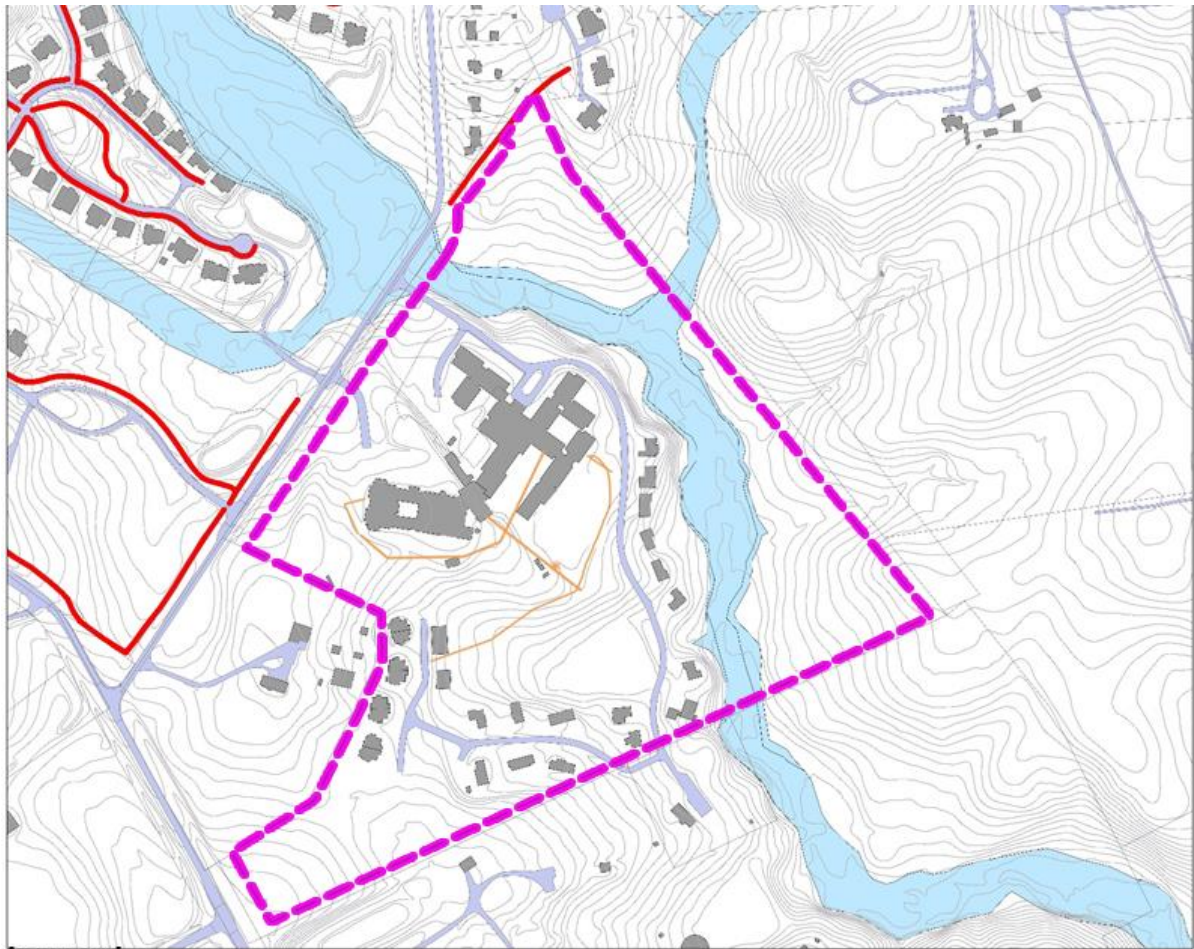
[More Recent Visits...](#)

Figure 42. Latest observed Bird Species

<https://ebird.org/subnational2/US-MD-031/hotspots?yr=cur&m=>

## Circulation

Pedestrian circulation within the site is possible through pathways that connect the nursing home and retirement community buildings to the Quaker Lane roadway. Also, two road systems connect the parking lots to the collecting road that is the main road between the highway and the site (Figure 45). In addition, there are primary pedestrian pathways (Figure 4446). that loop around the retirement community and pond and create access to the Memorial Garden. However, the existing pathways around the community gardens are not sufficient for the residents of the site to have regular walks, because the existing area around the building is fairly spacious and multiple shortcuts are needed for the older adult residents. The closest walking route to the retirement center is the path that residents frequently use to access the Community Garden, but the path closest to the building is not wide enough for wheelchair access. Many paths are long and are not in a suitable condition due to the lack of maintenance. They need to be regraded and repaved to enable all users, including those with mobility impairment, to easily use them.



**Legend**

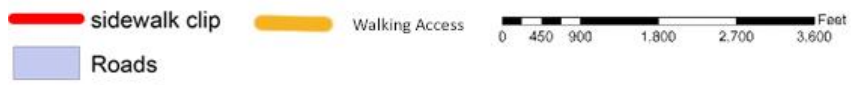


Figure 43. Circulation - Arc map



*Figure 44. One of the problematic walking pathways near the main building*

### Trail Access

An existing trail system connects the Friends House property to the Northwest Branch Stream Valley Park (Figure 47). This trail system starts from behind the existing single-family houses and continues to the forest (Figure 48). Signage near the Friends buildings ((Figure 48) alerts people to the trails and points the way there. These trail are open to the public and are often used by the residents and visitors who enjoy taking longer walks. It is important to link to the trail system from the circulation pathway to encourage the residents, visitors, and staff of FHRC to get out and explore the nature trails.



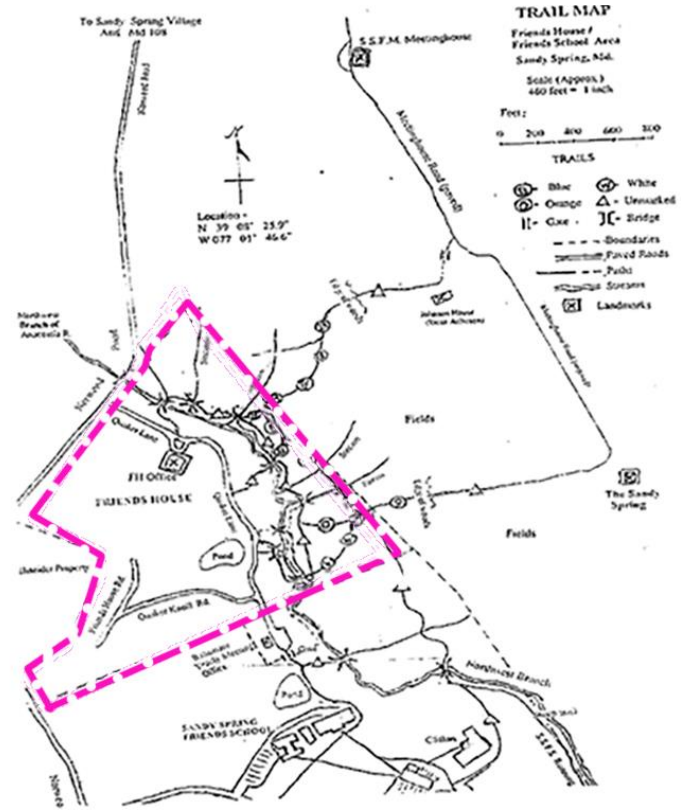
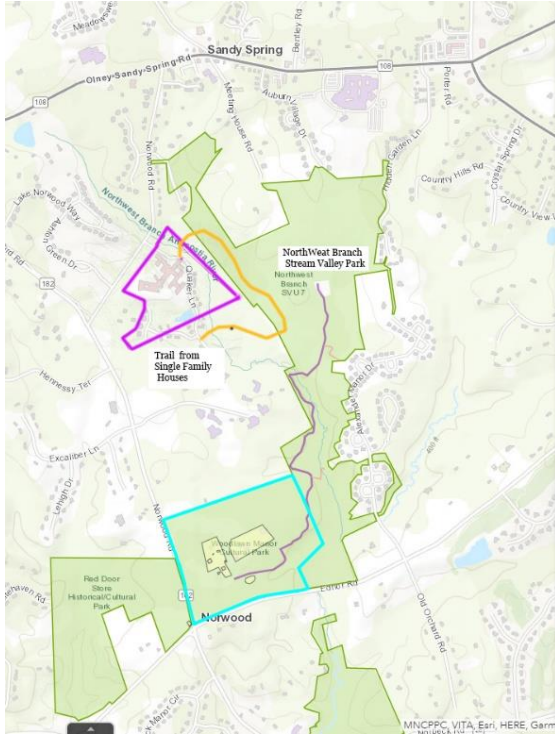


Figure 45. Existing Trail System at the Site

<https://mcatlas.org/parks/?find=K03>



Figure 46. Pictures from the trail system behind the site April 2019

### Existing Building and Facilities

The Friends House campus contains single-family homes (cottage, lodges, and houses) and the main Retirement Center building. Within the Retirement Community building and the attached Nursing Home, there are multiple facilities available. They include independent living such as one bedroom apartments , “ Assisted Living, Memory Care and Skilled Nursing” ([www.Friendshouse.com/residences](http://www.Friendshouse.com/residences)), community room for gatherings, dining room and gym.

One-bedroom apartments (Figure 52) are located inside the retirement community building in the west Wing. Each apartment can be accessed from that wing’s indoor shared hallway but each apartment also has individual access to the outdoors through a door with a small paved patio and planting area..

Several activities are offered to the residents with the goal of motivating social, cultural and horticultural activities. Indoor activities including musical, artistic and educational events and game nights are held in the retirement community building’s community room. Programmed (planned) and unprogrammed outdoor activities take place in the Memorial Garden and the Community Garden, including in the greenhouse and storage sheds within the Community Garden (Figure 49 and Figure 50). (*Figure 51*).



Figure 47. Assisted Living West Wing



Figure 48. Retirement Center Main Entrance

<http://www.friendshouse.com/lifestyle/photo-gallery/>



Figure 50. One Bedroom Apartments at the Retirement Center



Figure 49. Community Garden storage sheds

### Existing Outdoor Spaces

#### *The Community Garden*

The Friends House Community Garden is located in the middle of the property, on the western side of the Retirement Center building and southern border of the nursing home. This location has been used for vegetable gardening for more than 40 years. According to the executive manager, produce from the garden was grown for the daily use of the Friends House kitchen before commercial food preparation took over. Today, this garden is the primary outdoor gathering and social activity space available for the

residents. They use the vegetable beds to grow plants and help each other in gardening. Currently, residents are asked to share 10% of their produce with the community. There are some seating areas inside the Community Garden, but access is in many places not ADA compliant. This makes it difficult, and at some points impossible, for residents with impaired mobility to reach the garden or move around within it.



Figure 51. Location of the Community Garden within the property line- Google maps 2020



*Figure 52. Community Garden, existing condition, view from the top, picture provided by a Friends House Resident -2018*

The vegetable beds are currently assigned to 30 residents. Any individual can have their own vegetable bed, but they help each other in the process of gardening. There are two water spigots with hoses located in the garden. Electricity for the garden was supplied by the wings of the retirement building that were recently demolished, so in future, the greenhouse and the garden will use separate electricity systems.

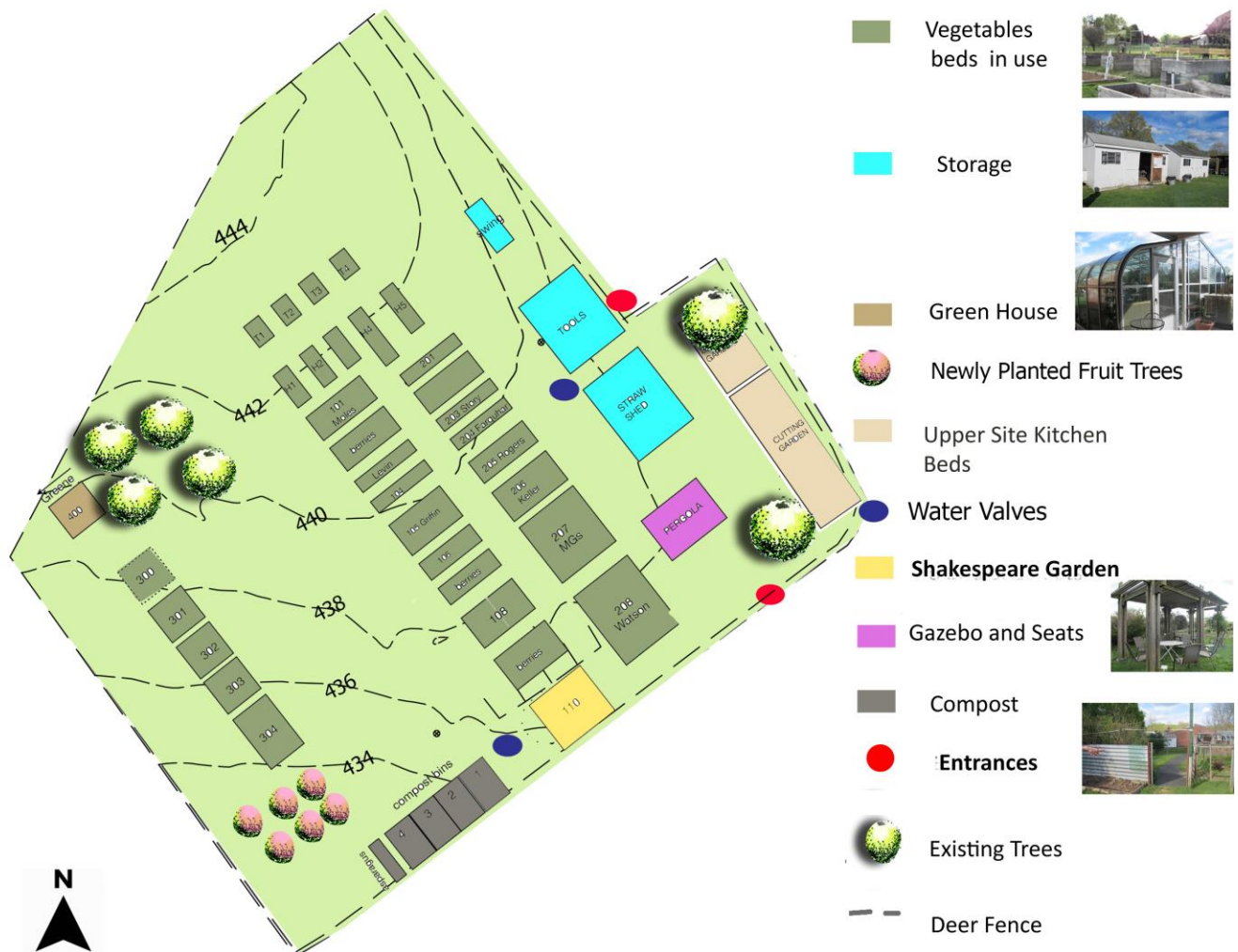


Figure 53 Friends Community Garden Existing Condition – drawing provided by one of the community members with Legend and Photos by author

### Friends Memorial Garden

Located in the southeast area of the property, Friends Memorial Garden is where ashes of Friends residents are kept after they have passed away. According to residents, this garden has been located in the same place on the site since the retirement center was

built in 1959. Today, residents sit on the benches and reflect on the memory of their friends who lived in the community (Figure 56 and Figure 57). A memorial plaque lists the names of the residents, especially those who have made contributions to the community .



Figure 55. One of the residents showing the importance of the Memorial Garden and the memorial plaque



Figure 54. Friends Memorial Garden - Existing Condition



### *Northwest southeast slope toward the pond*

The constructed stormwater management pond is located on the downhill side of the slope, creating a beautiful view of the natural environment surrounding the pond and the green buffer in front of the single-family residential area. To provide ease of movement for pedestrians and people in wheelchairs, as well as to avoid icy slippery conditions, it is important to reduce the percentage of the slope to no steeper than 5%.

### Conclusions from Site Inventory and Analysis

Figure 5658 is the accumulation of all aspects of the site that has been studied by author. As illustrated in this map, the Friends House Retirement Community is in the middle of the land that is part of the community of Friends. This is a unique site that

provides many opportunities for the residents and visitors such as access to fresh air, sunlight and nature.

There is significant potential on the FHRC site to increase residents' access to and engagement with nature. Most of the residents are retired people with years of experiences in different fields from architecture to gardening to teaching. They present practical and helpful points of view in reaching a design solution. It is important to ensure that all design solutions are age- and ability-appropriate.





Figure 56. Site plan with highlighted features

## Chapter 4: Design

This project started with the initial visit to the site, where residents of FHRC were contributed their ideas about improvements to the outdoor space. After multiple site visits and conversations with the residents and the executive board; studying the related literature; and analyzing the site’s opportunities and constraints, the design program took shape. It is important to listen to clients and translate their needs into specific design solutions. Below is a summary of conversations with FHRC residents during the research phase of this master’s thesis.

	Meeting with / Date	Description	General point of view/Meeting outcome/ quota	
A	Resident A/multiple	Resident of the single-family house, Friends House master gardener for over 26 years. FHRC liaison.	Primary FHRC liaison. Provided tour of the site. Requested a fast process for an accessible path to the outside for residents.	<i>“We had the blue path before, but it didn’t maintain very well, this is actually useless now.”</i>
B	Administrator A / April 2019	Friends House executive director	Provided a history of Friends House, goal of the development plan/tax credit for investors, utilities infrastructure. Discussed issues among residents such as isolation and loneliness while they are getting older and their families are not around. Also noted the importance of “sense of place” for residents.	<i>“We try to design the new resident spaces based on the memories of the residents.”</i>
C	Administrator B / April 2019	Nursing Home administrator	Runs a meditation group (based on aromatherapy) that occurs every week at the resident community/ garden.. Mentioned the mobility limitations caused by cognitive impairment.	<i>“Nature brings joy.”</i>

D	Participant A in the interaction group meeting	Resident of the retirement community	Mentioned that they like gardening and they are trying to participate in more outdoor activities.	<i>“The Community Garden is the only outdoor social activity right now.”</i>
E	Participant B in the interaction group meeting	Resident of the retirement community	A former architect	<i>“We are open to new ideas and then will evaluate how they can work for us.”</i>
F	Participant C in the interaction group meeting	Resident of the retirement community	Stormwater management is an issue	<i>“The Memorial Garden is where we keep the memories of dead friends.”</i>
H	A resident of the assisted living	Resident of the assisted living		<i>“The smell of daffodils reminds me of the under window garden , my childhood and my mother.”</i>

*Table 1 Summary of conversations with Friends residents and employees*

Based on these conversations (Table 1) below are the FHRC clients’ fundamental design requests:

- Access from and to the nursing home and assisted living accommodations for all residents including wheelchair and walker users;
- Low maintenance design with budget consideration for an outdoor space which suits older adults;
- Areas for serenity and reflection.

*Goals and Objectives*

The primary goal for this project is to create an opportunity for the residents of the Friends House Retirement Community to safely access the outdoors and engage with

nature, in order to optimize residents' health and well-being. The proposed design not only provides residents with easy access to the outdoors but encourages them to do so. Social events, physical activities, walking, gardening, or simply sitting and enjoying the fresh air are some of the activities that one can engage in the restorative environment. The secondary goal is to protect the site's significant natural, cultural and environmental resources.

The following objectives emerged in response to site inventory and analysis in combination with the client's expressed needs:

1. Provide walking paths that connect different gardens and areas of the site together. Also, in the next development phase, the pathway system can tie in to the existing trail system that connects FHRC with the nearby Northwest Branch Stream Valley Park.
2. Choose appropriate areas for different functions by providing different activities to implementing the concept "accessibility for all users" in every part of design features by understanding the existing site's opportunities and challenges and implementing Universal Design Principles.
3. Improve and increase the availability of gardening facilities to grow vegetables, flowers and plants for all residents of FHRC by providing better access to the Community Garden and greenhouses and by creating more areas for raised beds near the building.
4. Repurpose the new flat land provided by demolition of Wings C and D of the original retirement building, by proposing the first phase of the Healing Garden in that area.
5. Reduce feelings of isolation and loneliness by providing residents with opportunities for sensory stimulation and social interaction by creating serenity spots, gathering areas, specific planting design, and other design features that are helpful for this purpose.

### *Sociocultural Characteristics*

The Friends House property is a unique site. The site context is the most important feature of this project which includes both physical attributes and historic and cultural traits. Historically on this site, Quakers used the land for growing tobacco and corn. The soil is fertile, and the Community Garden includes a kitchen garden that used to provide vegetables for the retirement community before the corporation took over. The existing trail system that connects the site to nearby park is another important feature that highlights the importance of walking and keeping mobile. Moreover, the Memorial Garden has been designed to remember dear friends who passed away, but also is a place to sit and reflect.

### *Simplicity in Design*

In addition to implementing creativity in the process of design it is equally important to consider the users' needs as a priority. Some of the FHRC residents have dementia or cognitive impairment, so it is important to use simplicity in the design process. An intuitive design style can help people enjoy the garden space without needing to consciously decide what to do within the space. According to Hendrix (2013) and UDP, in order to justify a design to others, it is important to consider different humans' senses, all of which "affect the way we understand and create our world" (p.1). In order to form a design based on this concept, simplicity and sensory experience must be considered. The senses can be stimulated by interaction with nature such as watching, smelling, touching, listening, and feeling.

## Design Development

### Areas of Focus

The Friends House Retirement Community is a 62-acre area. To create a successful and realistic design, it is important to establish different phases that can be implemented in time rather than all at once. Important spaces on the site are considered as the following

(Figure 59 and Figure 60):

- Community Garden
- Memorial Garden
- Stormwater management pond
- Best view to the pond
- Beehives and bamboo grove
- Oak tree courtyard/New flat outdoor area (formerly Wings D and C)
- Nursing home main entrance
- Borders with residential cottages and single-family homes

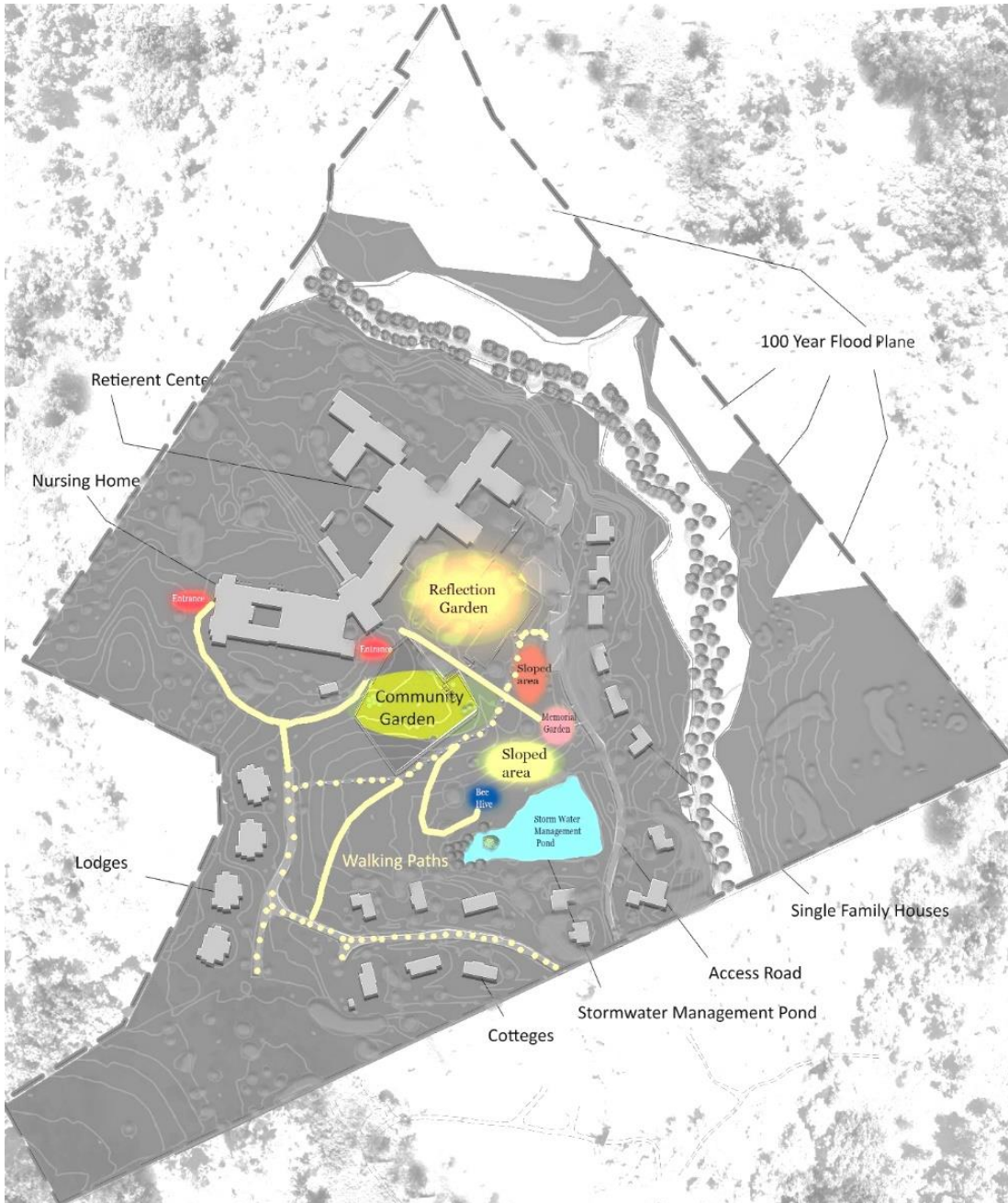


Figure 57. Outdoor areas for potential design

Steps in the design process included:

- Identify a suitable alignment for the shared use path between the pond, Community Garden, and main building (assisted living and nursing home) as well as the Memorial Garden and Healing Garden;
- Maintain and reuse the existing circulation system;
- Create socializing and serenity spots as well as a gathering destination for the residents.

This thesis project focuses on design of the following specific areas:

1. Redesign of the Community Garden
2. Design of the Healing Garden
3. Design of walking paths and “pathway nodes” between buildings and the gardens

### *Design Features*

Table 2 shows the primary design features that work together toward the design goals. Considering the restorative characteristics of the garden, as well as the comfort and safety of the users, are important factors in choosing design features (Bardenhagen & Rodiek, 2016).





Figure 58. Restorative Environment

<b>What (Design Features)</b>	<b>Why</b>	<b>Reference</b>	<b>Notes</b>
Curvilinear pathways and looping trails	Safe circulation for all users, including people with dementia. Provides shortcuts in longer pathways.	<i>Cooper Marcus &amp; Sachs, 2014</i>	
Individual wooden seats	Safe and affordable seats within the Healing Garden	<i>Universal Design Principles</i>	<i>Company: Wellspring</i>
Circular bench	To sit under the shade of mature trees and protect trees	<i>Cooper Marcus and Sachs 2014</i>	<i>Company: County Casual Teak</i>
Benches with back and arms	Along the walking path	<i>Universal Design Principles</i>	<i>Company: County Casual Teak</i>
Garden gate	Divide the gardens and provide a landmark for walking paths	<i>Cooper Marcus &amp; Sachs, 2014</i>	
Garden for physical activity	For outdoor exercise and healing	<i>Zhang et al., 2017</i>	
Raised beds	Gardening opportunities for wheelchair users	<i>Zhang et al., 2017</i>	
Window Gardens	Gardening opportunities for frail residents	<i>Cooper Marcus &amp; Sachs, 2014</i>	
Handrails	For pathways between assisted living to the Community Garden and Healing Garden	<i>Cooper Marcus &amp; Sachs, 2014</i>	
Fence	To provide the feeling of security and privacy with the ability to enjoy borrowed landscape	<i>Client</i>	
Side flower garden	For beautifying the pathways	<i>Cooper Marcus &amp; Sachs, 2014</i>	
Trees	Native, provide shade, consider planting lost specimens	<i>Client</i>	<i>County provides funding for native gardens</i>
Shrubs	Safe nontoxic native species as well as pollinator attractant for some spots	<i>Children's National Healing Garden</i>	

*Table 2. Design features and supporting research*

### *Universal Design Principles*

Universal Design Principles (UDP) are an important part of designing a healing garden for elderly people. UDP cover ease of access, flexibility, low physical effort, simplicity, and intuitive design in use. The following instructions are the summery of the instructions at the Universal Design Principles website ([universaldesign.ie](http://universaldesign.ie)):

**Flexibility in Use:** “Providing choice in methods of use, accommodate right or left-handed access and use, facilitate the user’s accuracy and precision and providing adaptability to the user’s pace” ([universaldesign.ie](http://universaldesign.ie) p. 1).

**Equitable Use:** Provide the same means of use for all users whenever possible and provide equivalent opportunities when the same means of use for all is not a possibility.

**Simple and Intuitive Use:** Provide flexible design by eliminating unnecessary complexity, being consistent with user’s expectations and intuition, accommodating a wide range of literacy and language skills, arranging information consistent with its importance, and providing effective prompting and feedback.

**Low Physical Effort:** Allow users to maintain a neutral body position, use reasonable operating forces, and minimize repetitive actions as well as sustained physical effort.

**Size and Space for Approach and Use:** Regardless of the user’s body size, posture or mobility, the appropriate size and space should be provided for approach, reach and manipulation.

**Other:** Providing a clear line of sight to important elements for any seated or standing user and ability to reach to all components with comfort for any seated or standing user is necessary. Accommodating variations in hand and grip size and providing adequate space

for the use of assistive devices or personal assistance should be considered as well (Centre for Excellence in Universal Design, 2020).

### *Accessible Pathways*

Providing a way in and out of a garden is a key to enabling access to the garden. The first design feature is accessible pathways (Figure 62) which are curvilinear and have plants at the edges. For this location, access to and from the assisted living building (nursing home), retirement center and roads is one of the key factors of the design. However, these pathways are not limited only to connecting the garden and buildings. FHRC is part of a large community, so it is important to for residents to be able to orient around the whole site. Also, new access pathways are circulation tools to connect to the larger trail system that connects Friends House to the existing county trail system and Friends School. Also, these pathways include loop trails which are visible and safe for adult pedestrians to walk or for wheelchair users to easily move along it (Figure 5961).

According to Cooper Marcus and Sachs (2014), a garden should provide a sense of control for the visitors. So, it is important to provide an access path which is safe, easy and comfortable. Curbs or raised ages along the path help the users navigate in a safer way and also help avoid washout from its surface onto planting beds. In order to prevent glare from the path, it is important to use a pavement material that is not white or light grey.

As UDP suggest, pathways for wheelchairs should be 7 feet or wider. This enables two wheelchairs to be side by side. In addition, handrails along specific parts of the pathway assist older residents with limited mobility. Pathways are considered 8 feet or wider with permeable pavement. They should have side gardens with plants such as

native shrubs and climbing vines. Also, the elevation differences within the site have been addressed in the pathways in slopes less than 5 percent. According to Cooper Marcus and Sachs (2014) (Figure 5961 , and Figure 63) in order to avoid tiredness during walking, seating should be placed at 25 foot intervals. In addition, as features of interests, seats and flowering shrubs have been located near the building entrances. In addition, as Cooper Marcus and Sachs (2014) point out, careful attention to design details for visual impairment should be considered in the design. For example, some shadow and colors differences on the ground might be perceived as a hole or a change in grade on the pathways for those with visual impairment.

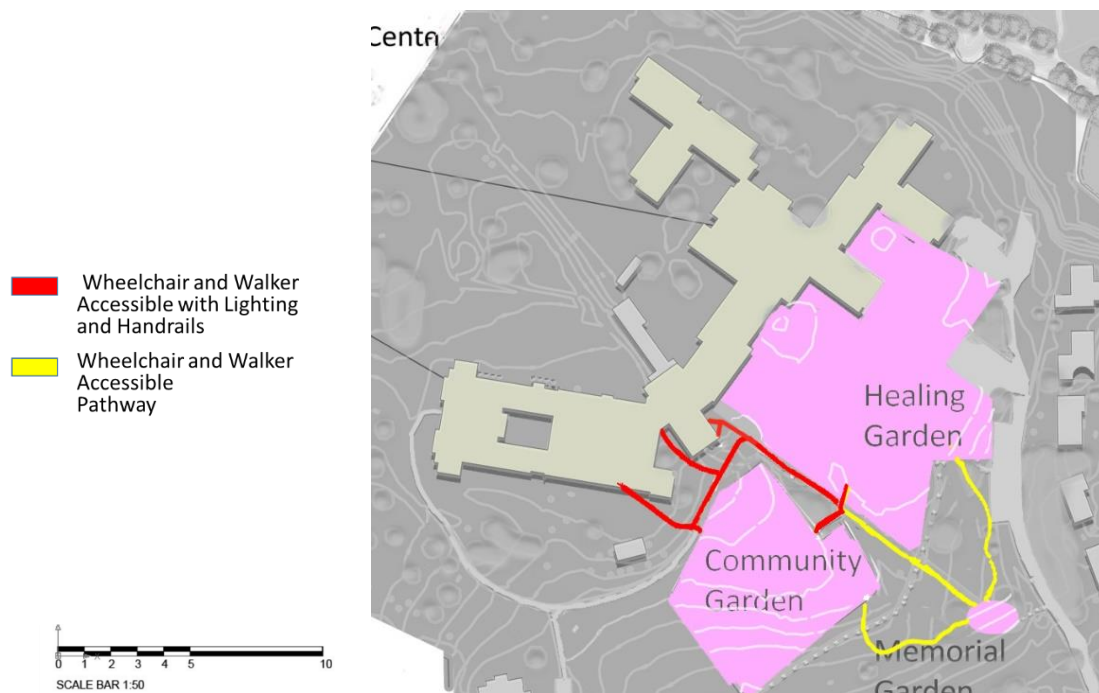


Figure 59 Connecting Pathways

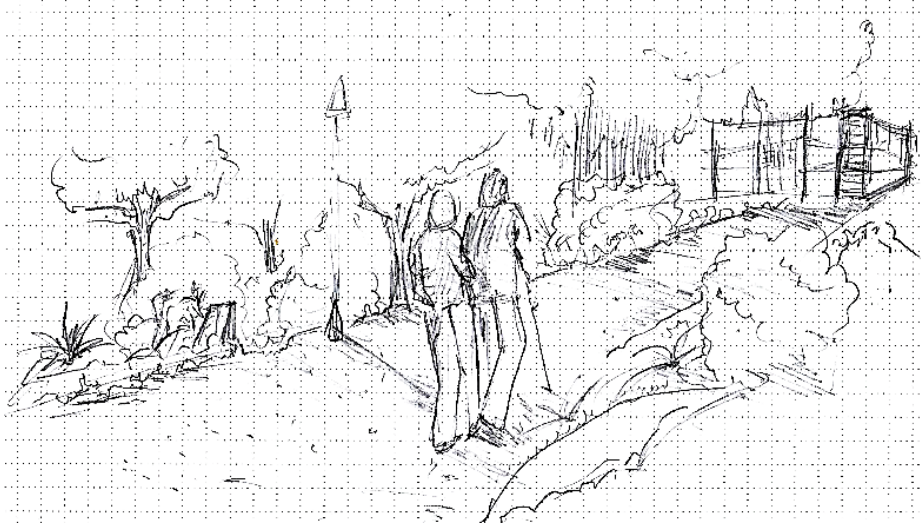


Figure 60. Conceptual sketch for the pathway

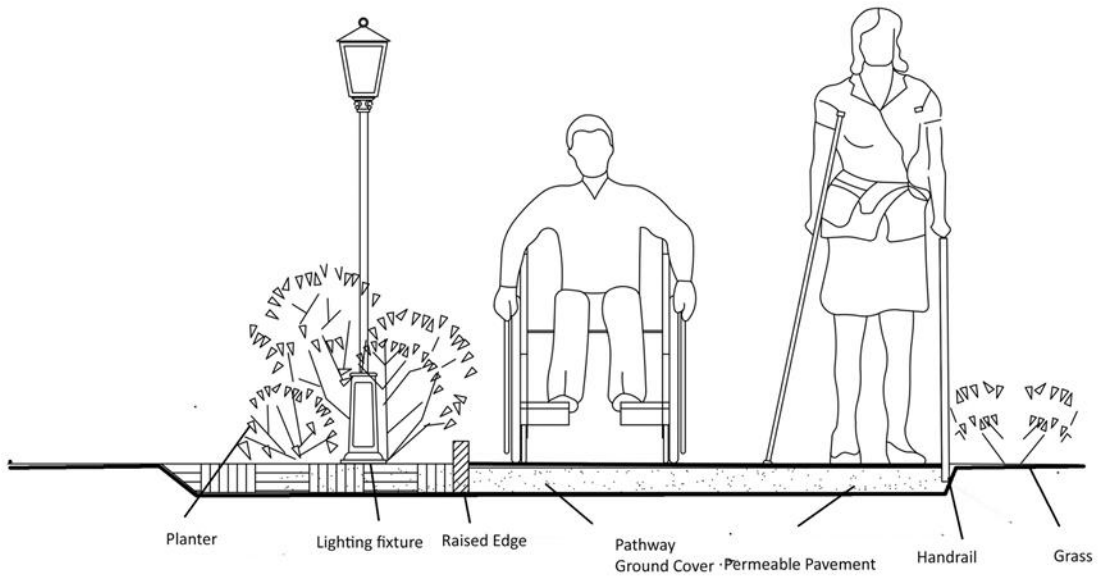


Figure 61. Pathways- Perspective



Figure 62. View from the main pathway toward the building

### The Healing Garden

The Healing Garden is sited in between the existing Retirement Center building and the parking lot. It is located on the relatively flat area of 2 acres that used to be Wings C and D (Figure 65Figure 65).

Specific physical design guidelines are important to consider for all therapeutic gardens. The following are the design features used in this project. The relationship between spaces are shaping between two building entrances, one main garden entrance and other spots such as meditation garden, seating areas, Serenity Spots and gathering/paved area. Parking lots and the building (one-bedroom apartments) form two borders of the garden. In the process of garden design, line, focalization, texture, light and shadow, and colors are important design tools that shape the original selection of the design elements. Design features are in line with the existing condition of the garden. They include existing specimens, building borders and parking borders.



**A**  
Retirement Community  
Main Entrance



**B**  
Oak tree  
inside the garden



**C**

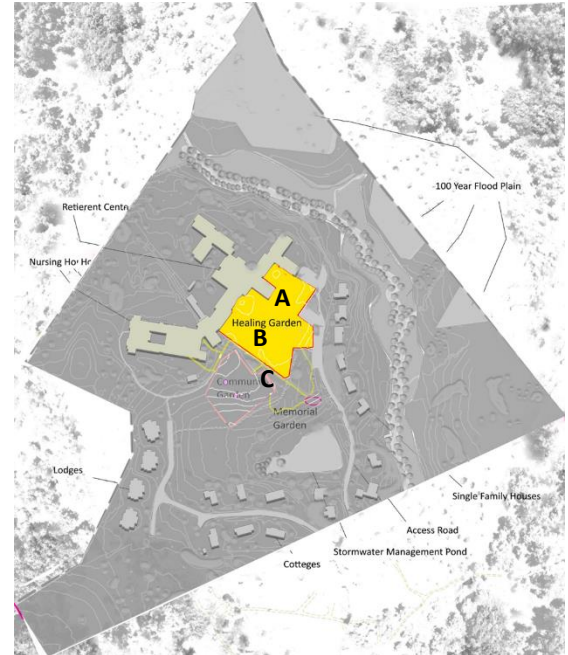


Figure 63 Healing Garden and related important features

*Fence* : Although the garden should be fenced to provide a sense of enclosure and to allow residents to feel safe (especially important for residents with dementia), it is important to have a view from the garden to overlook the broader landscape. The proposed picket fence should be no higher than 5 feet.

*Garden gate*: Garden gates are often seen as the threshold of a new world (Taylor's Guide 1988). It is important to provide an entrance that is attractive and welcoming. In the Healing Garden, the gate entrance frames the large oak tree located in the current



courtyard. To consider a spot that resembles an entrance or a transition point to or within the garden is vital for the intuitive design concept in the Healing Garden (Figure 6466).



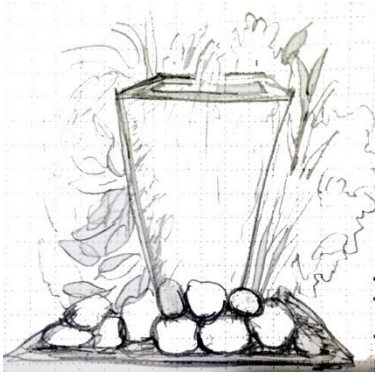
Figure 64 Suggestion for the garden gate and fencing

<https://www.123rf.com>

*Specimen trees:* Shade is an important part of design for any garden, especially when most users are older adults. Moreover, according to the client’s stated program and the history of plant species on the site, it is important to keep and resemble the historic specimen as the main species. Choosing the right location to replant the specimens is mainly based on existing seating areas such as in the Memorial Garden, benches and in the area that does not create minimal extreme contrast of dark and light on the ground plane. According to Cooper Marcus and Sachs (2014), slatted shadows can cause “visual cliffing.” This is a phenomenon in which dark shade on the ground, in contrast to lighter areas on the ground plane, can be perceived as steps or holes.

*Water fountain:* Water in the garden is an important design feature following the concept of stimulating the senses and creating intuitive design. Marcus and Sachs (2014) argue that it is important to provide naturalistic sounds such as water. The sound of water is

not only pleasing to people but also attracts a variety of birds and other wildlife species (Figure 65).



*Figure 65 Water fountain idea*

*Serenity Spots:* Although providing areas for social gathering is extremely important for a senior community, it is also important to provide locations where people can get away from groups to have a more serene, relaxing experience, a place to simply “be.” These “Serenity Spots” are an important part of the design as the clients specifically expressed the desire for this type of feature. The Serenity Spots are located at the edge of the Healing Garden near the parking lot, where they are surrounded with specimen trees and large shrubs for screening. They are safe, quiet and comfortable seating areas with pergola shade structures and the sound of water (Figure 65 and Figure 65).

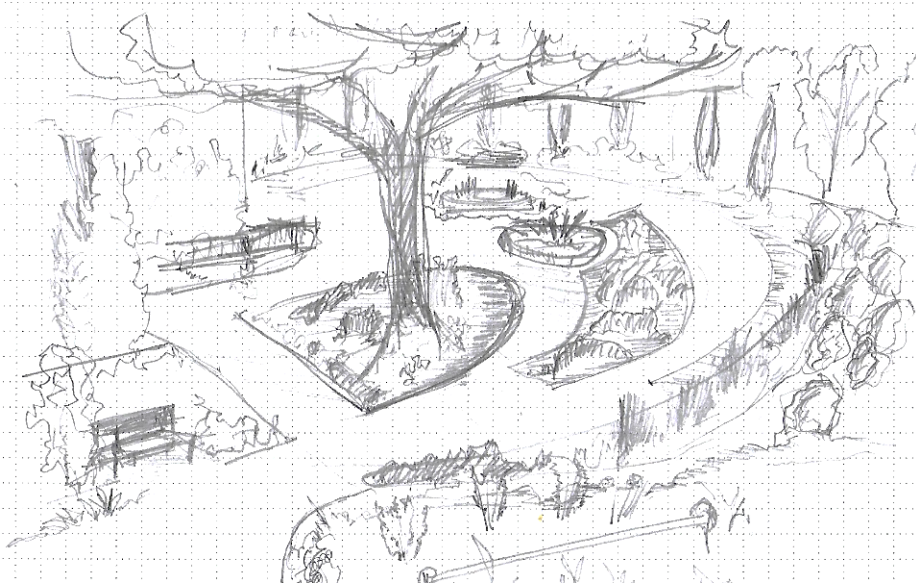


Figure 66 Conceptual sketch for Serenity Spots

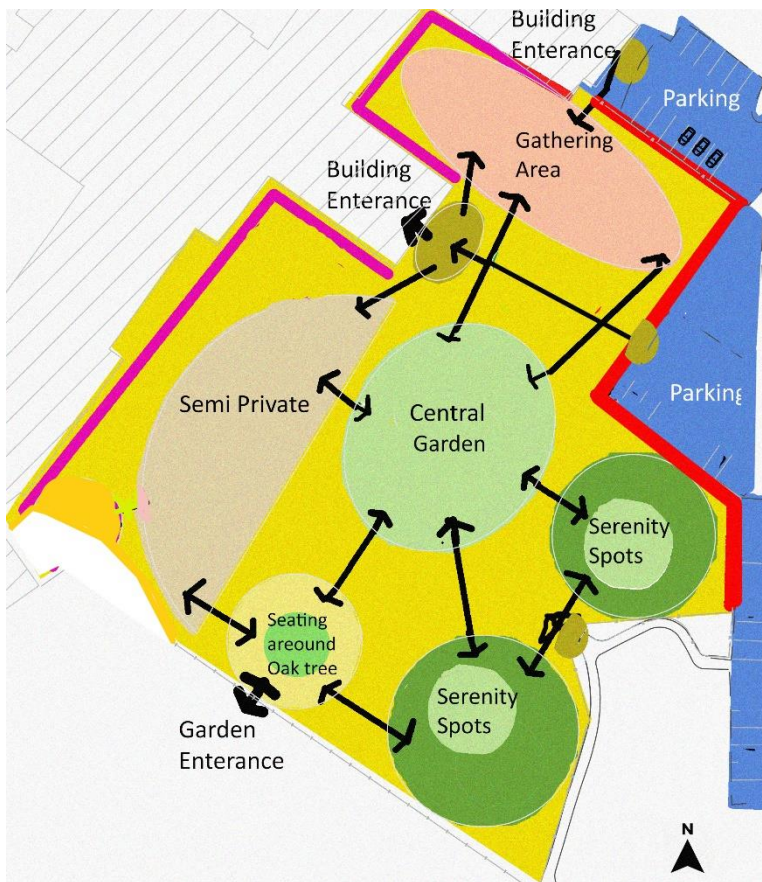


Figure 67 Functional Diagram and Relationship Between Spaces

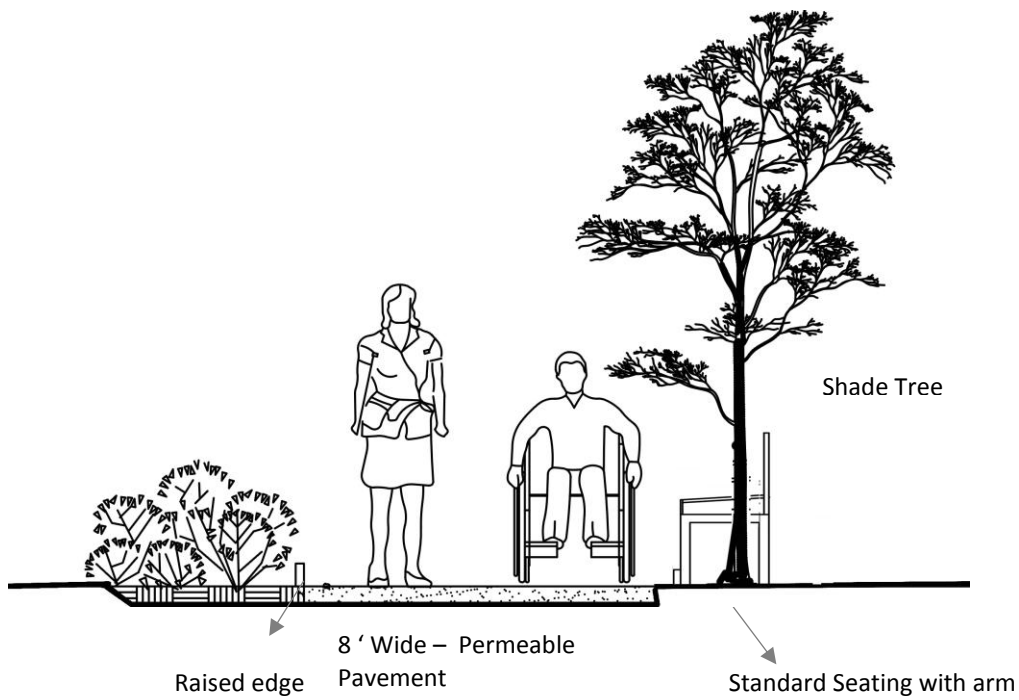


Figure 68 Garden Pathway Section- at the resting spot

*Garden pathways:* Circulation inside the Healing Garden is based on simplicity and safety. The main garden pathway is at least 8 feet wide, with a flat, permeable surface. The pathway is divided into two hierarchies of public and semipublic (Figure 71 and Figure 7072).

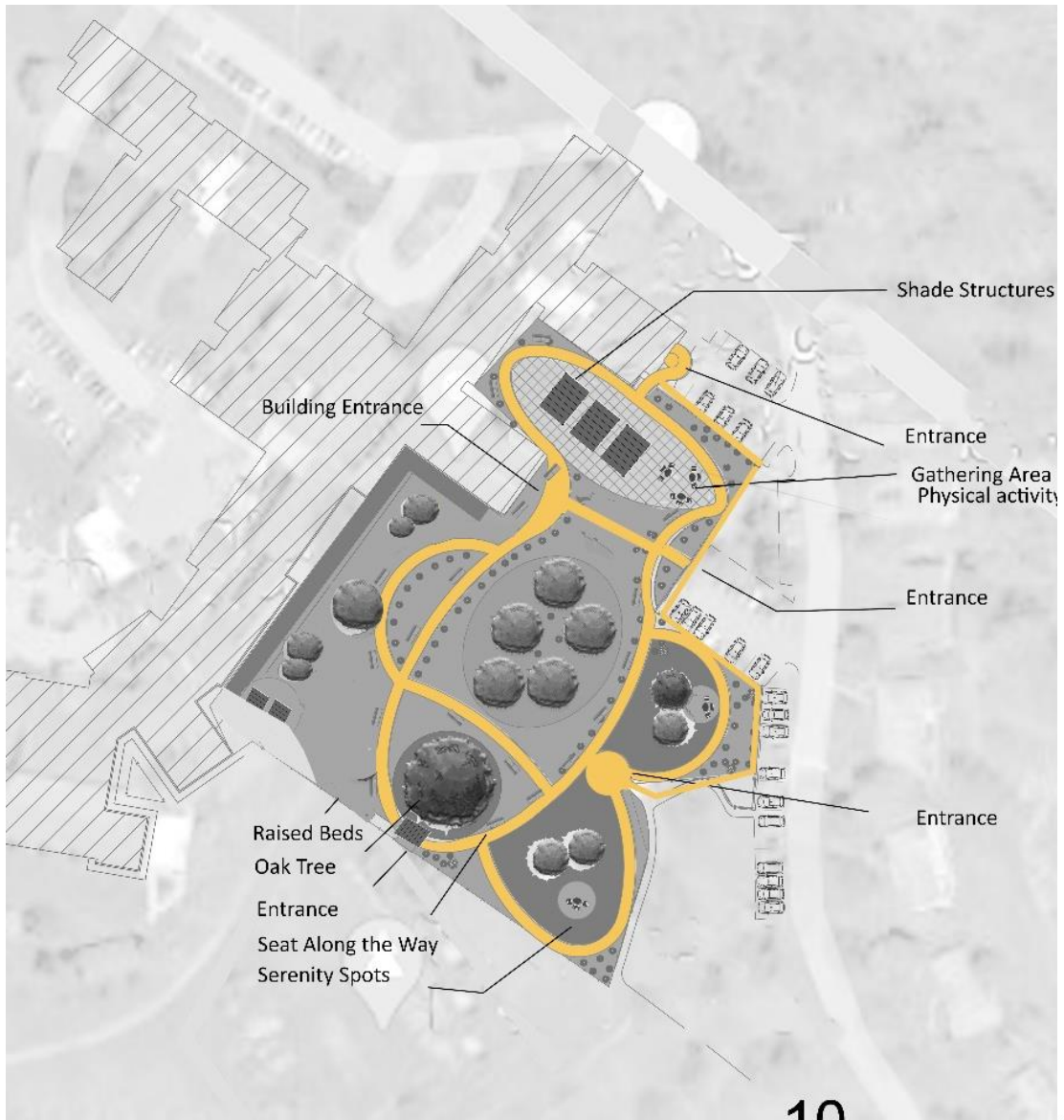


Figure 69. Garden Pathways within the Healing Garden

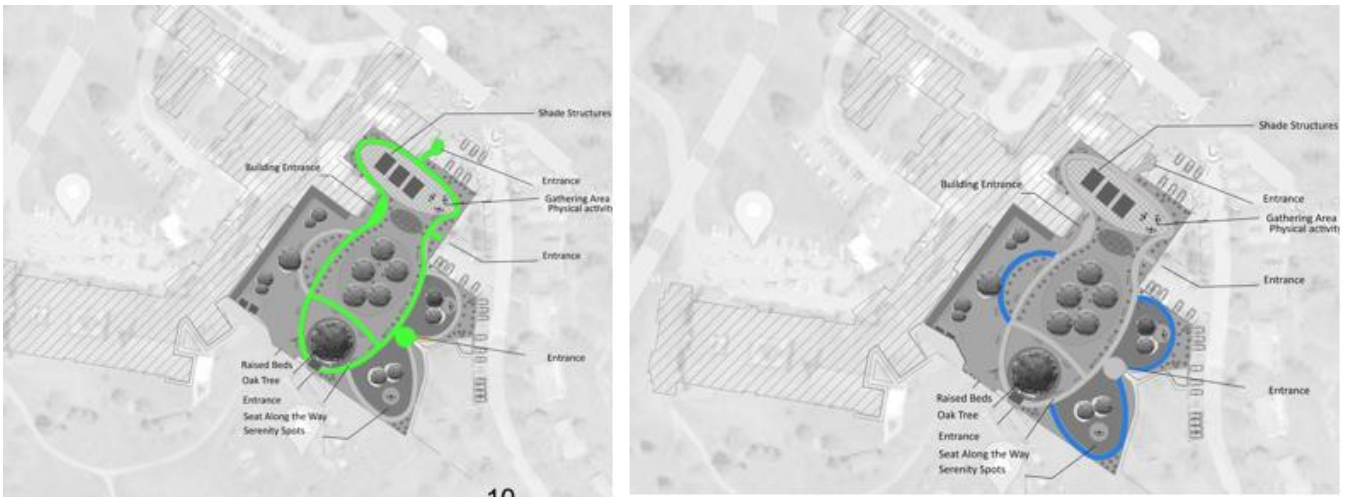


Figure 70. Hierarchy in pathways

One-bedroom apartments form the northwest edge and boundary of the garden. Although these apartments are connected to an indoor hallway, they have individual exits with side gardens from outside as well (Figure 73 and Figure 72). In order to connect the apartment residents with the garden while at the same time protecting their privacy, the public pathway is not continued near their outdoor entrances, keeping the rest of the area as a grass lawn.



*Figure 72. Connection of the one-bedroom apartments from inside the building*



*Figure 71. One-bedroom apartments at the retirement community, individual southern doorway.*

*Window greenhouses.* Although these one-bedroom apartment residents have small spaces at ground level where they can garden, not everyone wishes to utilize the space. Window greenhouses might be a substitute or addition for some residents so they can have their own private greenhouses, suitable for all season gardening (Figure 7476).

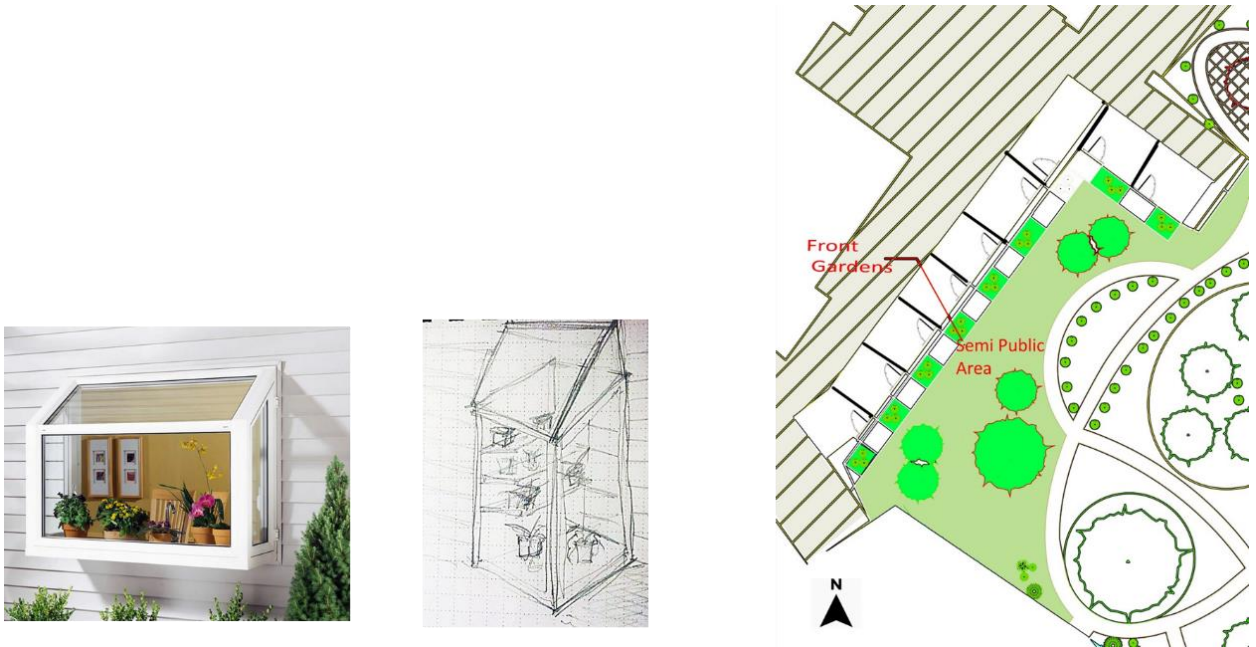


Figure 73. Suggestion for window gardening for one-bedroom apartments.



Suggestion for fixing outdoor seats in place

**Pathway Bench with arm**

<https://www.landscapeforms.com/en-US/product/Pages/Wellspring-Bench.aspx>

<https://www.countrycasualteak.com/benches/curved-benches/circular-teak-outdoor-bench-windermere-6401>

Figure 74. Benches and the suggestion for more stability for use in the garden and pathways



*Seats and benches:* Benches with arms and backs are provided along the pathways and in designated areas throughout the Healing Garden. According to UDP, the garden should be useable and safe for everyone. So, the seats and benches that are suggested are in standard sized for wheelchair users having backs and arms and being heavy enough to stay stable when people are sitting down and getting up. To add more stability, benches could be fixed to the pavement (Figure 7476 and Figure 7577)



Figure 75. Circular benches for under tree canopies- [www.https://www.countrycasualteak.com/benches/curved-benches/circular-teak-outdoor-bench-windermere-6401](https://www.countrycasualteak.com/benches/curved-benches/circular-teak-outdoor-bench-windermere-6401)

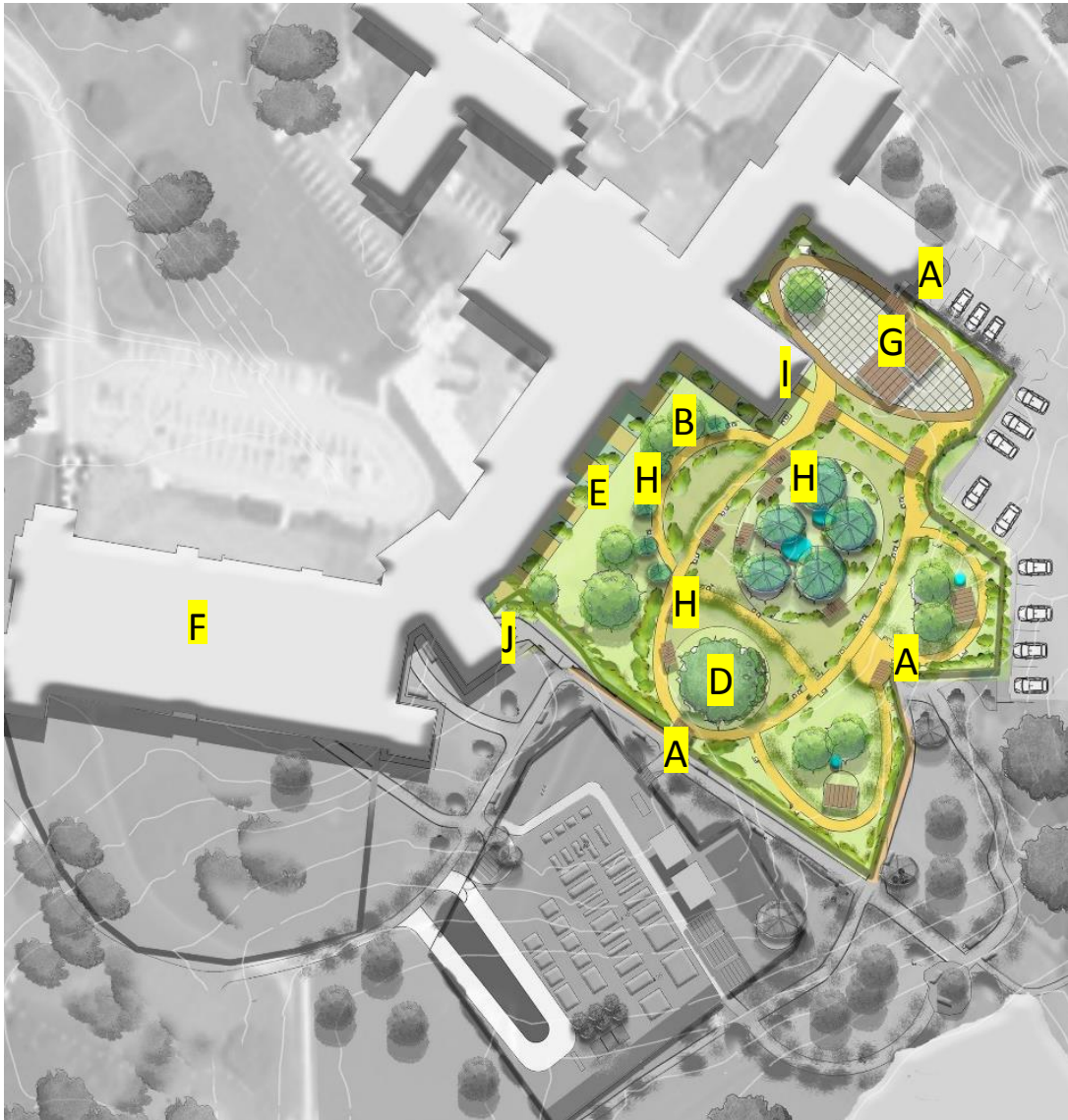


Figure 76. Healing Garden, Site Plan



- A Entrance to the garden
- B Meditation Garden
- C Pathway
- D Existing oak tree
- E Window Greenhouses
- F Nursing Home
- G Social gathering area
- H Serenity Spots
- I Entrance to the Community Center
- J Entrance to the Nursing Home form Main pathway



Figure 77. Healing Garden- Perspective

Community Garden

The location of the Community Garden is in between the main FHRC building (nursing home and assisted living) and the Memorial Garden. This garden has historically been used as a social gathering place for the residents. Therefore, it is important to ensure it not only adapts to the increased population of the residents but also is more accessible, safe, and well-organized, and that it still functions as a productive garden. The new

design layout is overlaid onto the existing Community Garden.

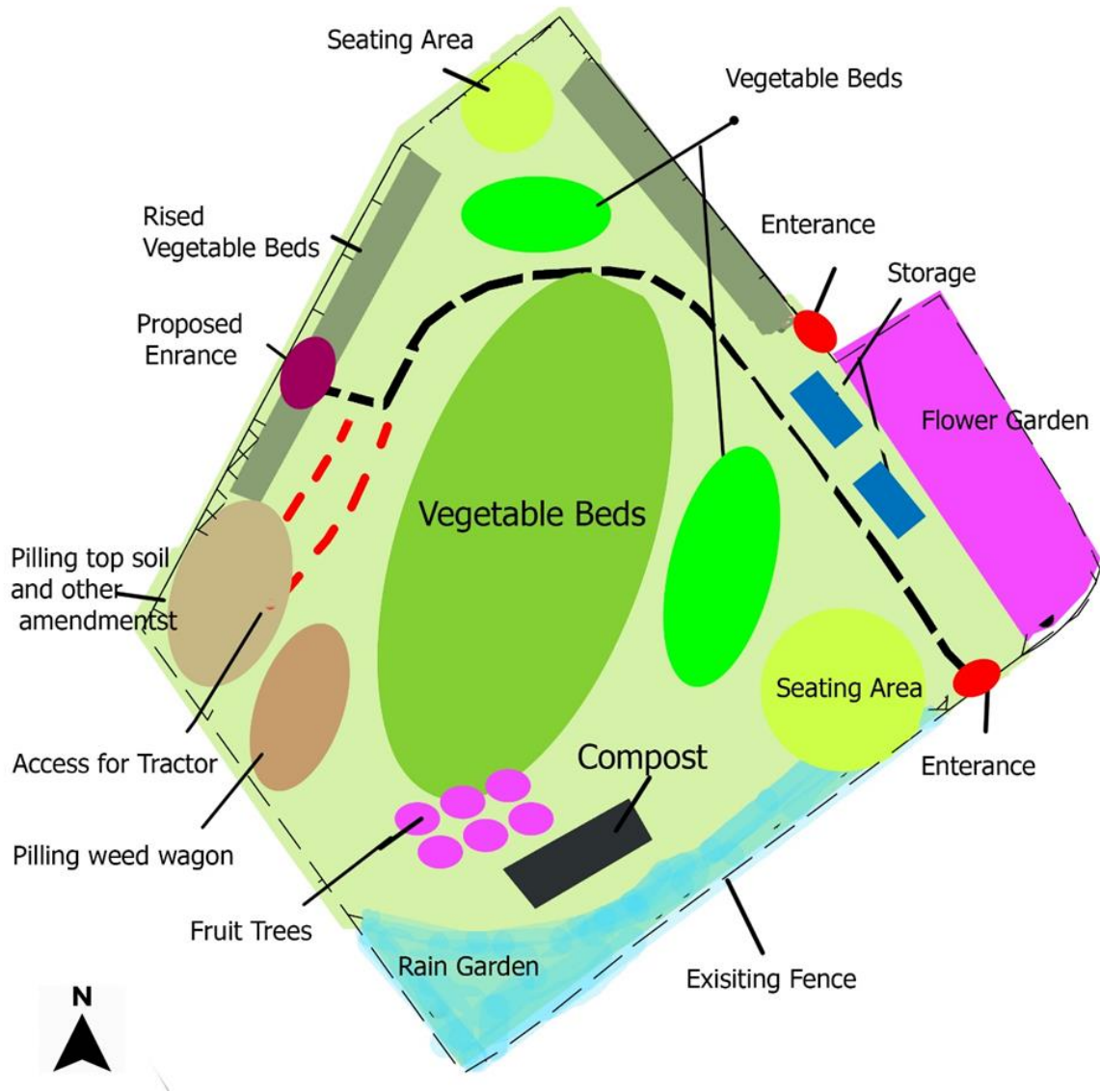


Figure 78 Community Garden - Functional Diagram

- A Elevated Vegetable Beds Near Entrance
- B Extra Seating Area
- C Tractor Access
- D Switch Western South beds to Topsoil pile area



Figure 79 Community Garden, Design Layout

### Planting Beds for the Community Garden

Most of the existing planting beds are raised beds that were constructed in place many years ago. Higher elevated beds were recently added to the garden to provide gardening opportunities for residents who use wheelchairs. In order to create a more finished look in the garden, this thesis design proposes modular beds that can be used at different levels (Figure 82). In addition, new raised beds closer to the main entrance of the garden will enable people with limited mobility, including wheelchair users, to more frequently and safely use the Community Garden (Figure 8183).

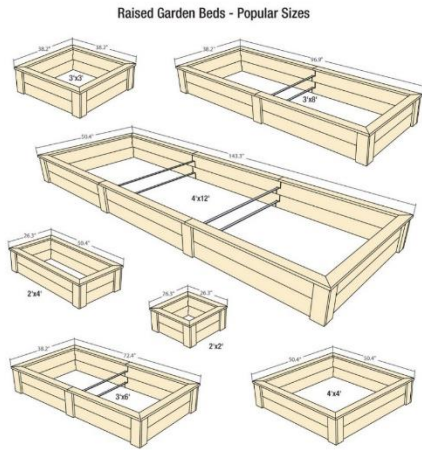


Figure 80 Suggested modular beds. [www.eartheasy.com/natural-cedar-raised-garden-beds/](http://www.eartheasy.com/natural-cedar-raised-garden-beds/)



Figure 81. Suggested vegetable beds for wheelchair users-  
<https://www.gardeners.com/buy/vegtrug-patio-garden/40-331VS.html>

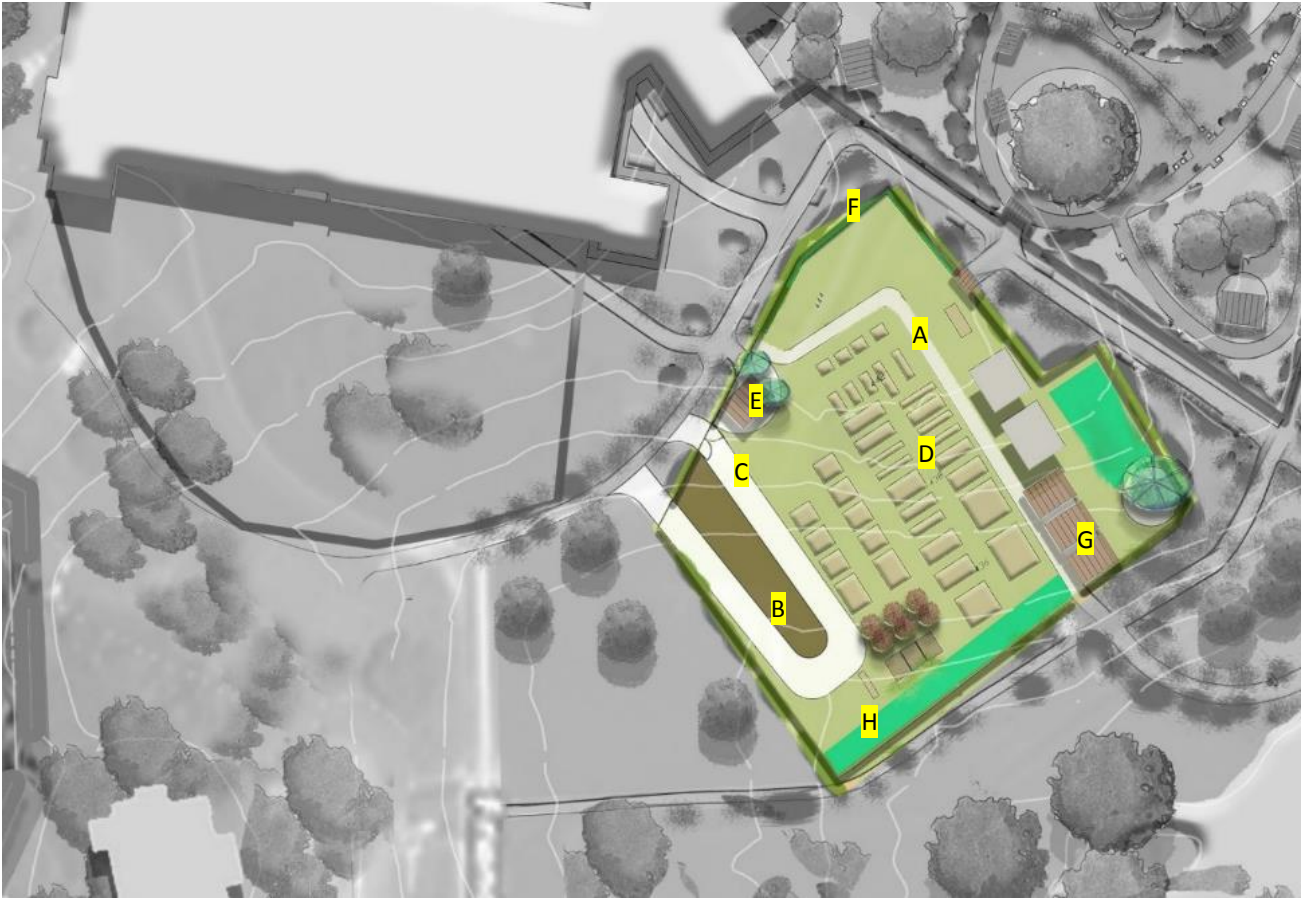


Figure 82. Community Garden Site Plan



- A New pathway
- B Topsoil pile
- C New tractor access and path
- D Existing raised beds
- E New additional seating area
- F New elevated beds
- G Existing seating area
- H New rain garden

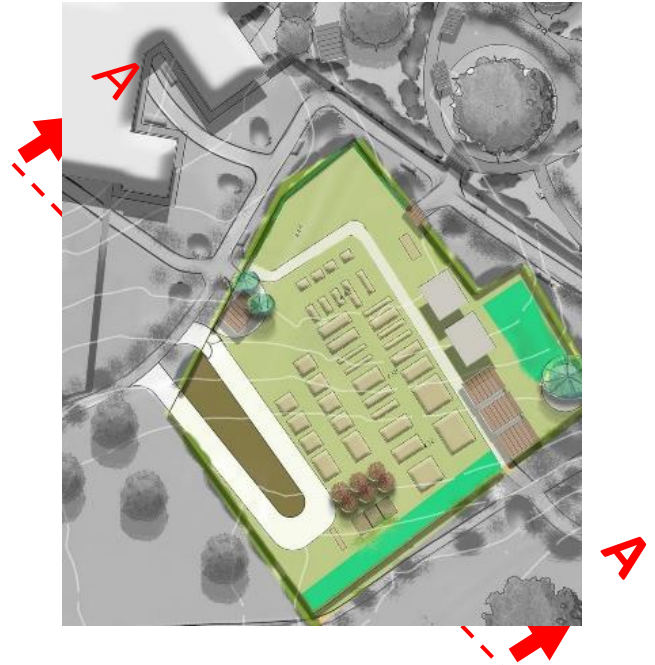


Figure 83. Cross Section of Community Garden

Pathway Nodes

It is important to constantly apply integration and fluidity in design so that users of the space will feel the connection of the different design areas and elements. This fluidity is employed in the shape of connection between focal points, such as gardens and nodes. In addition to the three main gardens at FHRC, small “pathway nodes” can also be considered as part of the overall restorative environment. They form a pattern for pathway intersections, or when a path faces a new choice of route. To accentuate these



pathway nodes and to soften the fenced borders, green planted edges are suggested for both sides of the pathways (Figure 86 and Figure 87).



Figure 85 Proposed locations for the pathway nodes

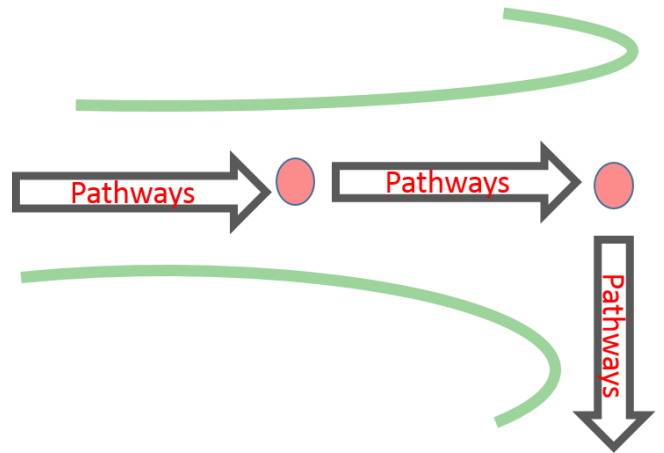
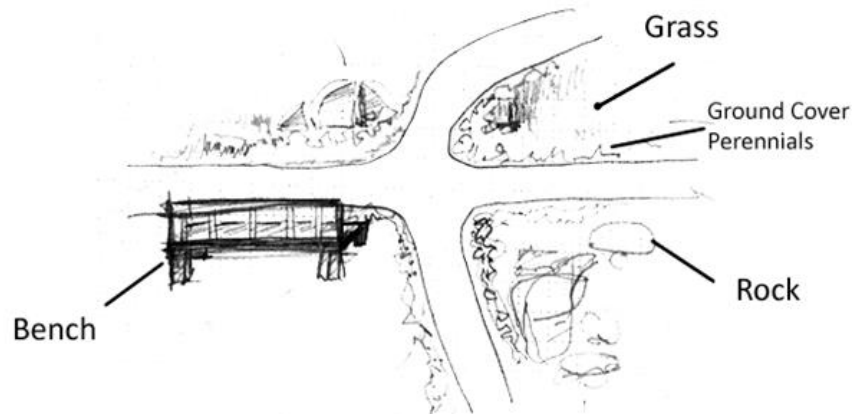


Figure 84 Conceptual diagram for nodes along pathways

Design suggestions for the pathway nodes help create of a sense of place. In this design, sense of place embraces the socio-cultural history of the site such as the importance of social gatherings and existing wildlife. This informs the design elements such as bird houses, pollinator nest boxes, and special plants and rocks between plants



*Figure 86 Schematic design for the nodes*

for beautifying the nodes and benches (Figure 88 and Figure 89).





Figure 87 Perspective from entrance to the Memorial Garden- an example for pathway nodes

### Planting Design

*In this phase of the project, a small palette offers suggestions for providing a natural look as well as variety in color, texture and scent for a multisensory experience (*

Table 3 ). The planting design for this community should be based on choosing safe plant species – plants that are non-toxic and low allergenic.

<i>Plant Name</i>	<i>Space</i>	<i>Deer Resistance</i>	<i>Plant Category</i>	<i>Picture</i>
<i>Miscanthus sinensis</i> ' <i>Variegatus</i> ' (silver fountain grass)	Side of the pathways	Yes	Grass	 <a href="https://calphotos.berkeley.edu">https://calphotos.berkeley.edu</a>
<i>Clethra alnifolia</i> (Sweet pepperbush )	Along the main pathway	Yes	Perennial	 <a href="https://calphotos.berkeley.edu">https://calphotos.berkeley.edu</a>
<i>Campsis radicans</i> ( <i>L.</i> ) <i>Seem. ex Bureau</i> (trumpet creeper)	Covering for fences	No	Vine	 <a href="https://calphotos.berkeley.edu">https://calphotos.berkeley.edu</a>
<i>Hydrangea paniculata</i> (panicle hydrangea )	Building entrance	No	Shrub	 <a href="https://calphotos.berkeley.edu">https://calphotos.berkeley.edu</a>
<i>Acer palmatum</i> (Japanese maple)	Serenity spots	No	Tree	 <a href="https://calphotos.berkeley.edu">https://calphotos.berkeley.edu</a>
<i>Cornus florida</i> (flowering dogwood)	Healing Garden and garden entrances	No	Tree	 <a href="https://www.gardendesig.com/trees/dogwood.html">https://www.gardendesig.com/trees/dogwood.html</a>




<i>Cornus sericea</i> (red osier dogwood)	Healing Garden and garden entrances-parallel to pathways	No	Shrub	 <p><a href="https://www.siteone.com/en/63726-103-cornus-stolonifera-cardinal-red-osier-dogwood-3/p/272058">https://www.siteone.com/en/63726-103-cornus-stolonifera-cardinal-red-osier-dogwood-3/p/272058</a></p>
<i>Ilex verticillata</i> (winterberry)	Healing Garden	No	Shrub	 <p><a href="https://www.gardenia.net/plant/ilex-verticillata-red-sprite-winterberry">https://www.gardenia.net/plant/ilex-verticillata-red-sprite-winterberry</a></p>
<i>Rudbeckia hirta</i> (common black-eyed Susan)	Healing Garden – Building entrances	No	Perennial	 <p><a href="https://extension.umd.edu/hgic/topics/recommended-native-plants-maryland">https://extension.umd.edu/hgic/topics/recommended-native-plants-maryland</a></p>

Table 3 Plant Pallet

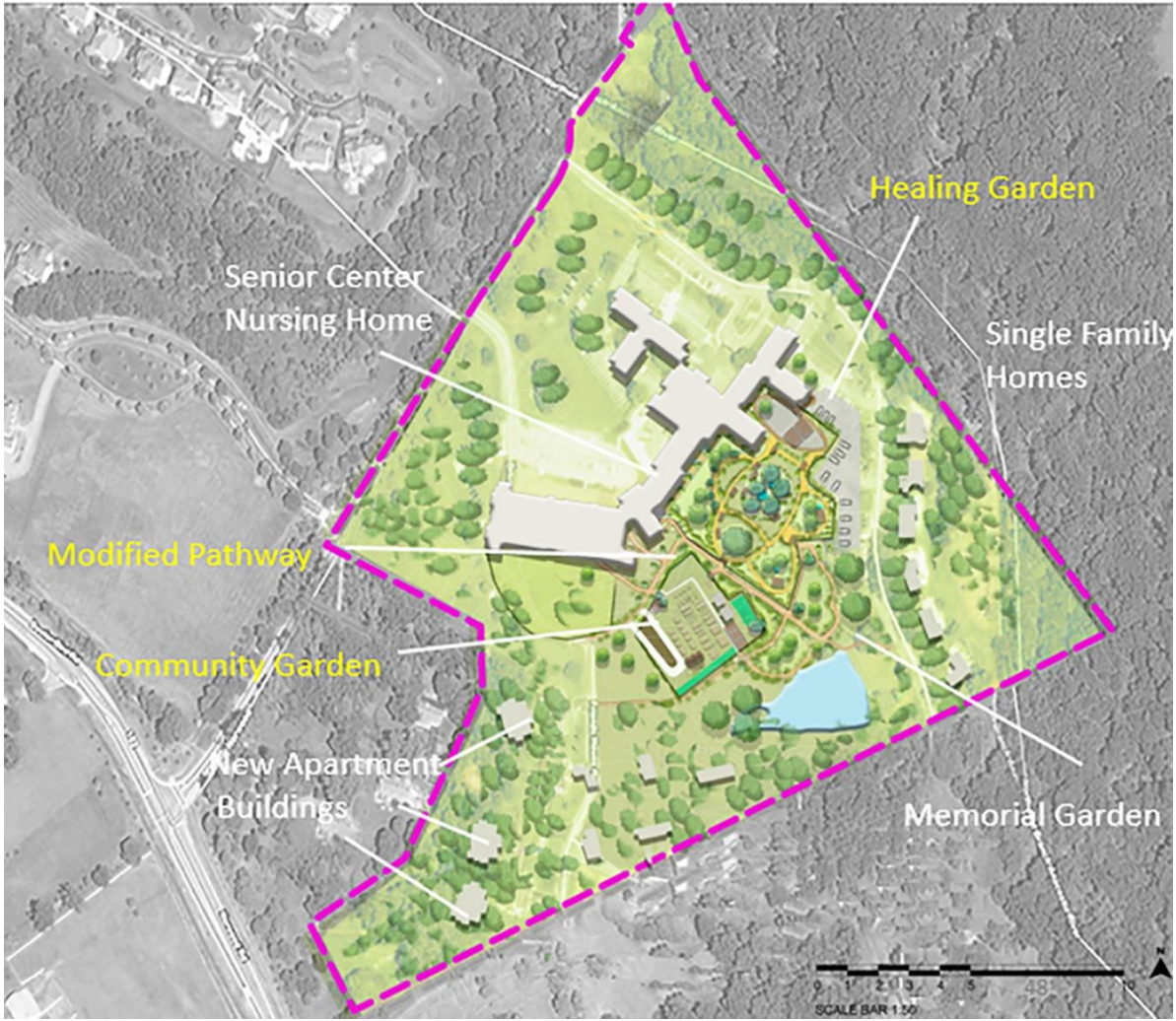


Figure 88 Site Plan



Figure 89. Healing Garden - Bird's eye view

## Chapter 5: Discussion and Conclusion

### Discussion

The primary goal for this project was to create an opportunity for the residents of the Friends House Retirement Community (FHRC) to easily and safely access and enjoy the outdoors. Studies show that access to and connection with nature can play an important positive role in the health and well-being of older adults.

The secondary goal for the project was to protect and enhance the site's significant natural and cultural resources. The design program and resulting design was borne out of a literature review, site visits, conversations with the client (staff and residents of FHRC), and site inventory and analysis.

The design proposal for a restorative environment at Friends House Retirement Community not only meets the goal of creating safe and easy access to the outdoors

environment for all residents, but also brings a new quality of space and emotion into the site. The design uses pathways, benches, plants, and other features to shape the physical environment in order to meet the varied needs of senior residents when they step outside.

Engaging with nature has positive effects on one's physical and mental health. By providing an evidence-based design, my hope is to create an outdoor space which is appealing and can lead to a better life for FHRC residents. An exploration of the variety of design features to use in the Healing Garden and Community Garden, as well as on the proposed linking pathways, distinguishes the design's approach from other less rigorously researched garden designs for senior residential facilities.

The design also responds to the residents' need for an active social life, balanced with places for reflection and calm. Interactions with the plants along the pathways and in the Healing Garden and Community Garden are provided in a way that encourages walking and exploring the area as well as attracting wildlife.

### *Limitations*

This was a design thesis for a Master of Landscape Architecture. Therefore, the research, design and writing were limited to a feasible timeframe. A longer timeframe might have enabled more site visits; in-depth focus groups with FHRC residents (for which Institutional Review Board approval would have been required); behavior mapping; and other more time-intensive methods for collecting data. Additionally, the timeline did not allow for a more iterative back-and-forth collaboration with the FHRC board and residents regarding design proposals and feedback.

### *Future Research and Design Work*



If the design from this research is implemented, a post-occupancy evaluation (POE) of the completed design would shed light on what design strategies were most effective and what could use improvement (Cooper Marcus & Sachs, 2014). POEs are an important tool for assessing a completed project and sharing the results. Future design work should build on this proposed design, which may need to be conducted in phases depending on the overall development plan, fundraising efforts, and so on.

### Conclusion

As people live longer and as the population of older adults grows, it is important to consider the design of senior care facilities such as Friends House Retirement Community. Development plans often emphasize the construction of more buildings and indoor facilities and do not pay enough attention to the outdoors that is so vital for this population. By providing landscape projects specifically for older adults, development companies can see positive examples of how to create more quality outdoor spaces for their clientele.

The Friends House Retirement Community project was a good fit with my interest in therapeutic landscapes. I was drawn to the idea of designing a garden, or series of gardens, for older adults. The FHRC site also exhibits many natural and socio-cultural characteristics related to living in a community that is surrounded by nature. This site has been used to provide caregiving for older adults for decades. The site is currently under a construction development program to increase housing opportunities for new residents. The growing number of FHRC residents will require more outdoor facilities for gathering, walking, gardening, and quiet reflection.



# Appendices



Completion Date 06-Feb-2020  
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This is to certify that:

**Afrouz Rahmati**

Has completed the following CITI Program course:

**Humanities Responsible Conduct of Research** (Curriculum Group)  
**Humanities Responsible Conduct of Research** (Course Learner Group)  
**1 - Basic Course** (Stage)

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