

Chronically Sustainable

Creating a Sustainable Community for the
Chronically Ill

An Architecture Thesis by Nicole Mathiowetz

CHRONICALLY SUSTAINABLE

A Design Thesis Submitted to the
Department of Architecture
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By
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In Partial Fulfillment of the Requirements
for the Degree of
Master of Architecture

North Dakota State University Libraries Addendum

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THESIS PROPOSAL

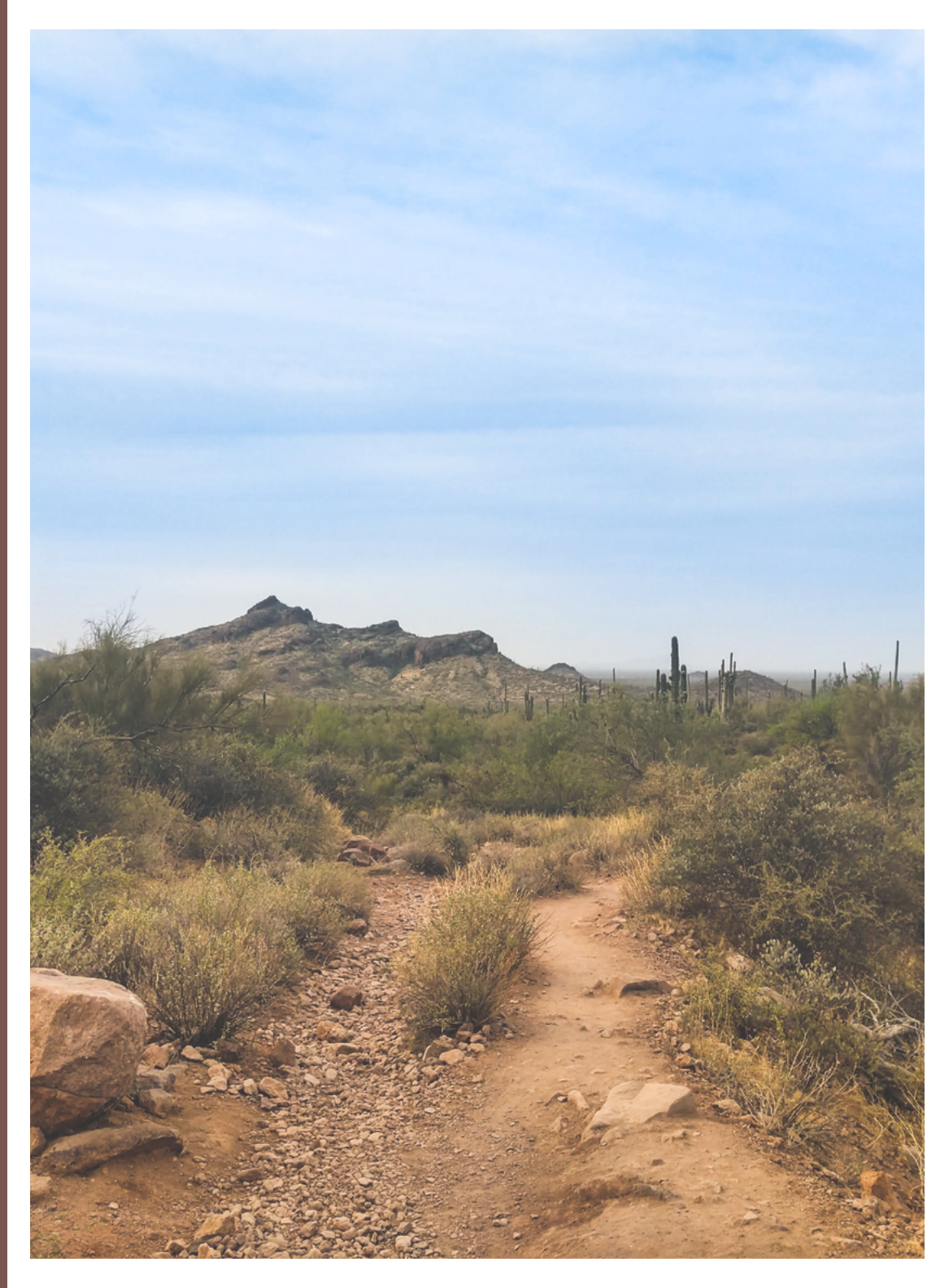


Figure 3| Wave Cave Trail

ABSTRACT

In a world that is rapidly changing due to climate change, there is a group of people that are being left behind in the “green” movement. This is not new for these people; the group has often been forgotten and under served by society throughout history. This group is the chronically ill. With a variety of abilities and needs, society has failed to give them the same opportunities in life as the abled body. Buildings are required to have accessible entrances but often time they are far from the main entrances and highlight a person’s disabilities by inconveniencing not just only the disabled but everyone in their group. Yet, there is even more to accessibility than ADA entrances. Accessibility has many factors such as affordability, access to resources, and usability.

This project focuses on how to create a community that is designed for the chronically ill with their various needs and abilities at the forefront of the design while considering the sustainability of the project. Located outside of Phoenix, Arizona within the Sonoran Desert, this project focuses on the ability to create a sustainable community that caters to a demographic that has struggled to become more sustainable due to their additional medical needs. The community will provide for the chronically ill and their families within the master planned community. Amenities include a community center, retail, grocery store, medical facility, athletic facilities, and leisure facilities. The project is divided into two parts: master planning the community and designing key community aspects.

NARRATIVE

Unifying Idea

Illness and death are often taboo topics that aren't appropriate for everyday conversations which can make living life with a chronic illness extremely alienating and lonely. For the loved ones of those with a chronic illness, life can be just as isolated due to lack of support from others and lack of community with those that truly understand. Life can be isolating not being able to openly discuss their experience with others. In recent years, people have begun to find others online that understand their struggles but what if there was a place that one could be surrounded by people that understood? A community that was designed for just the chronically ill and their families. A place where sickness and death can be openly discussed by the people that understand it the best. A community that understands the impact the built environment has on health, wellness, and safety of those that are the most vulnerable. A community that supports people of different abilities and backgrounds in both the built environment and in their social lives.

In a world rapidly changing due to climate change, new sustainable products are being developed and growing in popularity. Yet, these products often do not consider the needs of the chronically ill and disabled. Those that are chronically ill or disabled are often forgotten or ignored in the new green movement. Could a community that is designed for the chronically ill be able to do so sustainably?

Premise for Investigation

This project will study how to design a sustainable community that caters to the chronically ill in a location that faces many sustainability issues in a rapidly changing climate and world. This project will focus on two main aspects: Community for the chronically ill and sustainability. For the community aspect, the project will focus on the functions that aide the chronically ill and their families in their everyday lives. Functions will provide for resident's every day needs such as medical assistance, social interaction, and housing. For the sustainability aspect, the project will focus on attaining Phoenix's 2050 environmental sustainability goals.



Figure 4 | State Trust Land



Figure 5 | Superstition Mountain

Context

Phoenix, Arizona is known for its stunning views within the Sonoran Desert with many “satellite cities” located outside the original city limits of Phoenix. The area has recently become not just known for their gorgeous mountain views and 55+ communities but also because of the record-breaking droughts that have begun to risk the water supply of the Southwest. This project is located in an extreme location that has historically been deemed unsustainable due to its lack of many natural resources, predominantly water, to better understand the abilities of sustainable architecture. Creating a sustainable community for an underserved demographic would provide evidence that the same principles from this project can be applied to other communities in less extreme climates while still serving a forgotten demographic.

PROJECT TYPOLOGY

This project contains multiple typologies due to the scale and the numerous uses provided. Some of the typologies include:

Planned Community

This project contains a master planned community that contains multiple building types. The community aspect of this project will play a large role in the design as it will focus on the movement throughout the site, building placement, and interaction with the surrounding area on a larger scale than just individual building design.

Health Care

In ancient history, healing was often believed to come from the world and nature. When industrialization and the medical revolution began to change the medical field, patients became more isolated from the outside world. This project tries to connect healthcare with nature again by creating a community that is focused on achieving wellness through modern science, community, and nature.

Recreational

The community will offer many recreational activities that offer residents new life experiences that they may not be able to normally participate in. Many sports and group recreation activities are held at inaccessible locations or in public places that do not offer the additional assistance that many people need to engage in normal activities.

Residential

Within the community, there will be housing for the chronically ill as well as their families. The main form of residential buildings within the project will be houses to allow more access to the outdoors than apartment offer. These homes will be made to accommodate the changing needs of residents. The sizing of houses will vary for different family sizes.

Community Center

With many different uses and programs contained within, a community center would closely relate to a “clubhouse” for the project that offers classrooms, gym, pool, and other recreational uses while also providing small shops for residents to buy basic necessities.

TYOLOGY PRECEDENTS

While selecting projects for precedent studies, 5 criteria categories were considered:

Typology

Similar or applicable typology to those included in this project. Including planned community, health care, or community center.

Context

Applicable to or similar to project location in either urban setting or climate.

Urban Impact

Success within community and design field.

Environmental Impact

Success within community and design field.

Innovation

Use new methods to improve livability.



Civano
Tucson, Arizona



Acrosanti
Acrosanti, Arizona



Serenbe
Chattahoochee Hills, Georgia



Mesa Del Sol
Albuquerque, New Mexico



Children's Hospital of Pittsburgh
Pittsburgh, Pennsylvania



Maryvale Community Centre
Phoenix, Arizona

PROJECT ELEMENTS

Due to the scale of this project multiple elements are included throughout the community. These various elements are meant to serve the residents in their everyday needs and include various uses and activities. These elements can be applied in numerous ways and in multiple building types. While a community can have an infinite amount of building types and spaces, this project defines some of the possible project elements that could be included but not all will be fully designed during the final phase of this project.



Figure 12 | State Trust Land

Community

“Community is much more than belonging to something; it’s about doing something together that makes belonging matter.”

-Brian Solis



Figure 13 | Sedona Houses

Indoor and outdoor spaces to connect with other community members through various planned and unplanned activities.

- Garden: Accessible walkways and seating within a sustainable native desert garden.
- Pool: Outdoor leisure pool that offers hydrotherapy

Commerce



Figure 14 | Serenbe Commercial

Small stores for basic necessities.

- Grocery: Offers fresh produce and dry goods without the commute to a larger city.
- Boutiques: Small stores that sell goods from various community members.
- Hardware: Basic tools for home maintenance and woodworking.
- Crafts: Offers anything needed for arts and craft classes taught within the community.

Sustenance



Figure 15| Serenbe Bakery

A key factor to wellness is what fuels our body. Quality food and meals are vital to managing most chronic illnesses.

- Community Garden: In a remote location, the needs for local food may be greater than in large cities where there are large grocery stores. Small gardens with native foods can provide connection with community members and create nutrient rich food.
- Community Kitchen: Providing meals to those that are unable to cook for themselves while utilizing the community garden.

Education

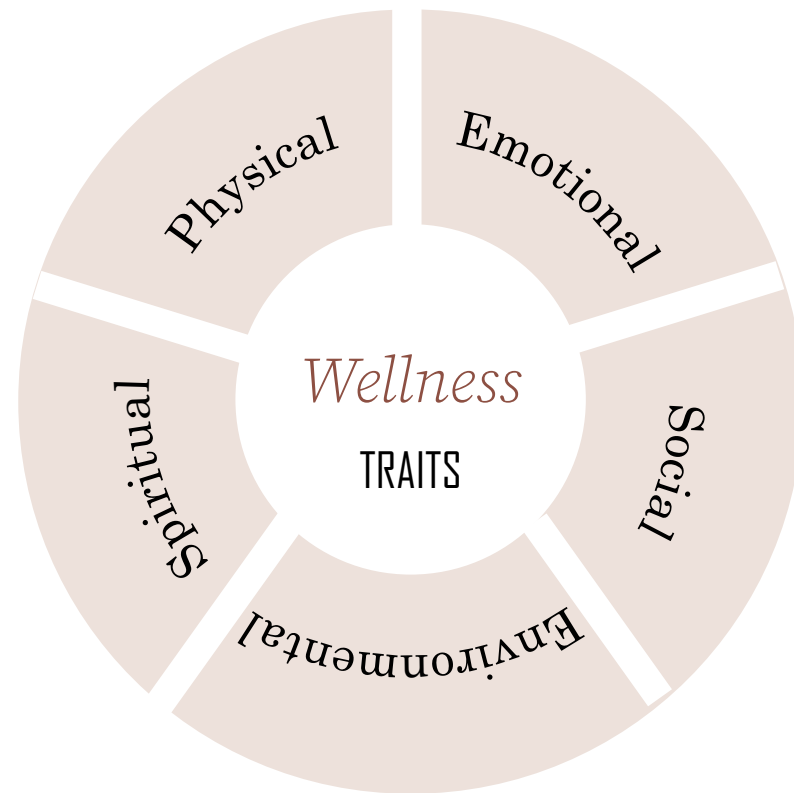
“Learning is a result of listening, which in turn leads to even better listening and attentiveness to the other person. In other words, to learn from the child, we must have empathy, and empathy grows as we learn.”

-Alice Miller

Teaching residents about various skills and offering knowledge on some of the illnesses that affect the community

- Education center: offers various classes on a broad array of topics such as arts and crafts, cooking classes, or medical classes for care givers.
- Library: Community space to share knowledge on the various illnesses that affect residents in the community.

Wellness



Spaces that cater to individual wellness, both physical and emotional through various care centers.

- **Medical Center:** Offers various levels of medical care such as a general doctor clinic for routine check-ups, a surgical center, and an orthopedic center for physical therapy.
- **Psychology clinic:** Separate from all the other medical offices this space will offer various forms of therapy for both the chronically ill and their families. Therapy spaces include art therapy and group therapy.
- **Gym:** A space for physical exercise that is accessible to people of various abilities that offers group workout classes and personal training.
- **Sports Courts:** Outdoor sport courts that are made accessible to people of various abilities that offer friendly competition

“Community is much more than belonging to something; it’s about doing something together that makes belonging matter.”

-Brian Solis



Figure 16| Wellness Resort

CLIENT/USER



This community is for the chronically ill and their families. To be able to better design this community for a more specific group of users, as chronically ill has a spectrum of meaning, I have decided to aim the community toward those that their illness moderately to severely affects daily activities. This means that one is regularly affected by their illness in their day to day life. Those affected may not be able to live the life that they otherwise would without their illness or may be able to with lifestyle changes and medical intervention.

Figure 17 | People

Residents

Chronically Ill

This can mean many things and summarizes a variety of illness and levels of independence. For this project, chronically ill will mean that the person has an illness that currently has no cure. Some illnesses may be managed and treated so that one can live a “normal” life while others may need significant assistance throughout the day. Some examples of chronic illnesses include asthma, diabetes, cancer, heart disease, and stroke. Those with a chronic illness sometimes call themselves Spoonies based on “The Spoon Theory” by Christine Miserandino.

Significant Others

Either a spouse or long-term partner that lives with the chronically ill. For many chronically this is their unofficial caregiver as they complete many daily tasks the chronically ill may not be able to do alone. They are also a big component of the ill’s support system. Significant others can often feel isolated as many of their friends do not understand the struggle of caring for a partner.

Family Members

This may be children or parents that live with the chronically ill. They may be dependent on the chronically ill. Family members often understand the struggle of living with a chronic illness better than most. Some children of the chronically ill may not relate to their friends’ family dynamics as they were not raised in a “traditional” family dynamic.

SITE

Workers

Caregivers

Hired professional that assists residents with daily activities for those that need additional assistance within their home. May commute to the community.

Medical Professionals

Doctors, therapists, and nurses that work within the medical facilities. They will offer a variety of medical services at the medical center.

Property Manager

Manages the community and organizes community events.

Facility Manager

Maintains community green space and completes necessary maintenance within community buildings.

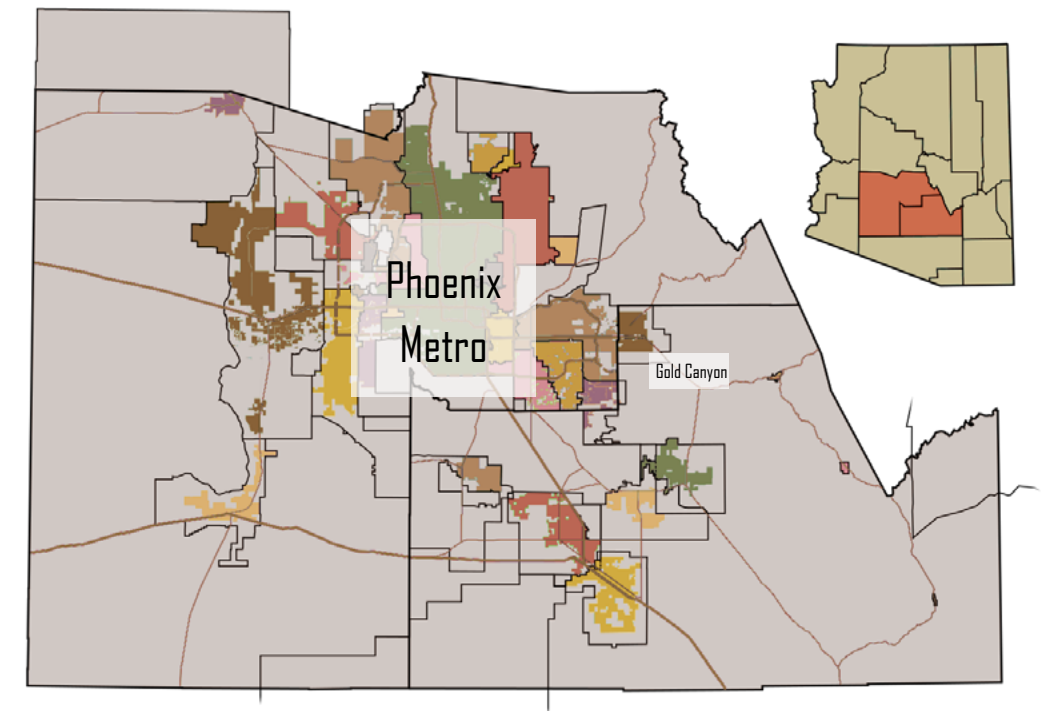


Figure 18 | Phoenix Area Map

33°21'18.7"N 111°24'54.5"W

Size: 50 Acres

This site is located outside the city of Phoenix in Gold Canyon, Arizona. Located on Bureau of Land Management property, the site is in the Sonoran Desert with views of surrounding mountains. This desert differs from surrounding deserts as it has subtropical warmth with two rainy seasons instead of one. It is near the US/Mexico border and maintains warm temperatures year-round. Located in an arid climate, temperatures are warm year-round with 2 rainy seasons. Annual rainfall varies greatly with 5-20 inches of rain. There are many plants that only survive in this climate, and some are native only to the Sonoran Desert such as the saguaro cactus.

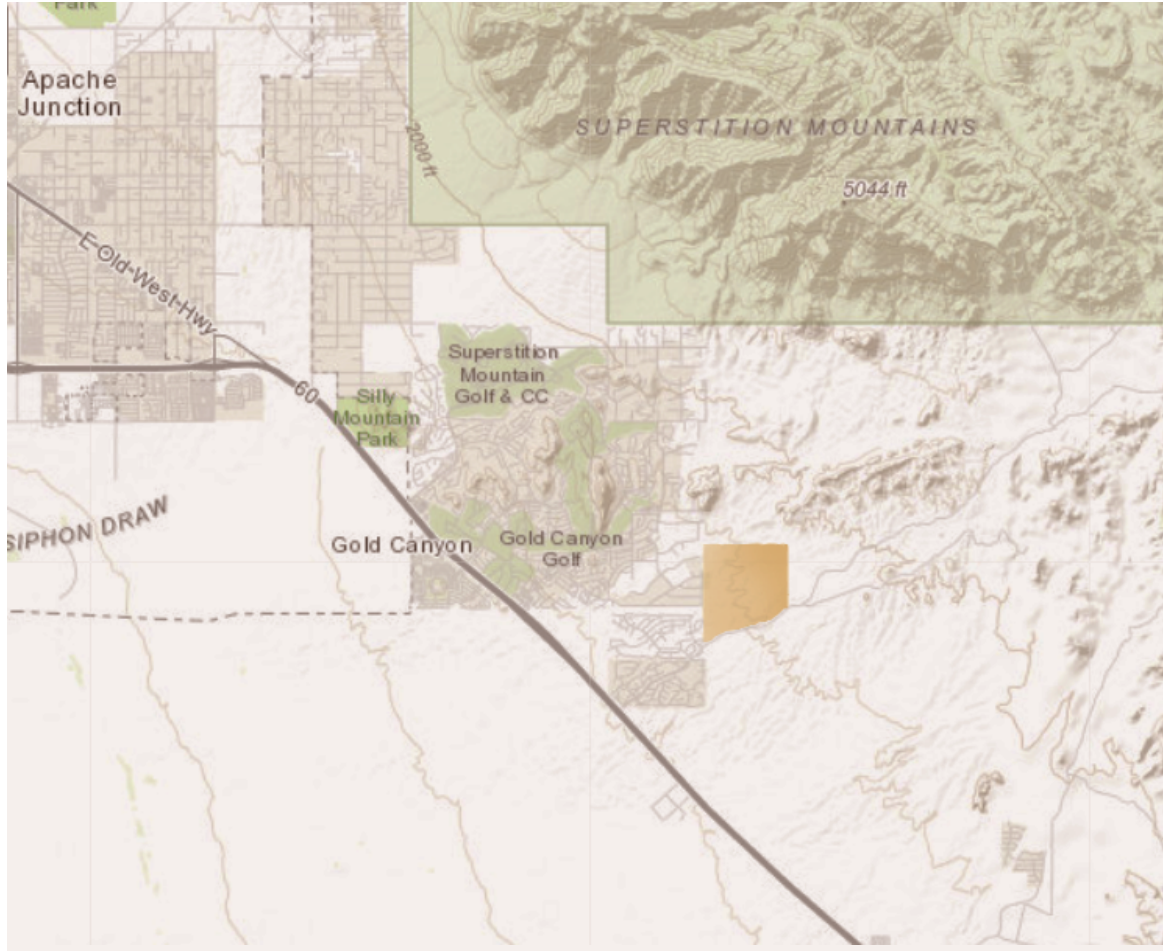


Figure 19 | Gold Canyon Map

Gold Canyon, Arizona

Gold Canyon is an unincorporated community in Pinal County with a population of over 11,000 people. The population is primarily retirement aged married couples with no children. Founded in 1974, is known for maintaining its rural, desert environment including its views of the Sonoran Desert, Superstition Mountains and Tonto National Forest. The community borders state trust land that is open to the public with hiking, ATV, and horse trails. While once in the middle of the desert, the community is quickly developing, and land value has nearly doubled since 2008. Gold Canyon has one grocery store, gas station, multiple restaurants, and pharmacies, which provide everyday necessities.



Figure 20 | Site Map

PROJECT EMPHASIS

Site Positives

- Desirable Views of Nature
- Near Existing Resources (i.e. grocery stores, medical facilities)
- Near Existing Utilities
- Ample Clean Energy Opportunities
- Desirable Winter Temperatures
- Near Numerous Outdoor Activities
- Privacy and Ideal Noise Levels

Site Negatives

- Considerable Distance from Phoenix
- Virgin Land
- Extreme Summer Temperatures
- Lack of Local Water Sources
- Proximity to Wildlife
- Semi-Remote
- Existing ATV Path Crosses Site

Sustainability

The medical field is often left behind in the move to become more sustainable due to the additional needs and required in medical facilities. Those with chronic illnesses also are left behind in the sustainability movement as many are unable to use “sustainable” reusable products and may not the physical ability to utilize many sustainable design elements. To be able to highlight the sustainability of the project, it is located in an extreme climate near a city that has often been called “the most unsustainable city.”

Inclusivity

This community focuses on inclusion of people of all abilities and needs. Accessibility is often an afterthought and can leave those that have additional needs feeling isolated. This project will ensure that all residents have the same access and opportunities regardless of their illness or disabilities. This means that all main paths of movement should be accessible by all.

Health & Wellness

Managing a chronic illness often takes years of learning and error while trying to discover what “normal” looks like for them personally. Having a chronic illness teaches a person more about their body and how to listen to it than a “healthy” person would ever be able to understand. This project will focus on creating a community that fosters both health and wellness. Health means a physical state of wellbeing while wellness means the state of living a healthy lifestyle. To cater to both, the project will use design to create a space that offers clean living with low-toxic materials and provide residents with resources to live a healthy lifestyle.

PROJECT GOALS

Investigate how to design for the chronically ill and disabled:

Learn to design in a way that puts the needs of those with illnesses or disabilities before those of the able bodied in a way that makes the built environment more accessible for all.

Educate others on living with chronic illness:

Educate others about the effects a chronic illness can have on one's life, including the often-forgotten social impacts.

Consider the effect chronic illness on the ability to live a sustainable life:

A person with a chronic illness produces more waste than an average person due to medical waste, some which is toxic.

Investigate the feasibility of a sustainable community in a naturally unsustainable climate:

Phoenix has historically been called "the most unsustainable city" which raises the question if any community can be sustainable within a location that lacks many natural resources.

PLAN FOR PROCEEDING

Research Direction

Due to the two sides of this project, sustainability and inclusivity, the research for this project will be both quantitative and qualitative. Research will be based on the programming, context, and typology of the project. For the sustainability aspect of the project, research will be more quantitative with research on sustainable design in arid climates as well as an in-depth site analysis that identifies potential sustainability opportunities. For the inclusivity aspect of the project, research will be more qualitative with research focused more on the impact on those with a chronic illness and the daily struggles that they face. This will include reading firsthand experiences and learning about the general inaccessibility in everyday life. Research will also include case studies for contextual comparisons and inductive reasoning based on real world data.

Figure 21 | State Trust Land





Figure 22 | State Trust Land

Types of Analysis

Quantitative Analysis

Interpret and analyze numerical or statistical data through investigation

Qualitative Analysis

Interpretation of data to identify how people subjectively understand and value their social existence

Exploration

Examine how quantitative and qualitative answers as applied to the design process

Plan for Design Methodology

This project will use a mixed method including structured design, inclusive design, and universal design methodology that will utilize the research during the research phase. Research will be utilized to create a design that is accessible to users of all backgrounds.

The Design Process

Unifying Idea

Sustainable design has the ability to be accessible to all

Topic Research

Learn new ideas that will assist in design

Testing of Ideas

Analyze ideas for efficiency and validity

Your Design Opinions

Formulate your design opinions on the ideas

Conclusion

Formulate your opinions into a conclusion that can be applied to your project

DOCUMENTING THE PROCESS

Sketching

Hand drawings and sketches will be used heavily in the early design phase as well as throughout the project. These will help to visually express the ideas and concepts being proposed in this project.

Computer Modeling

3D computer modeling will be used to help create visualization aids and construction details of the project. This model will help analyze the project in a level a detail that hand sketching does not allow as well as allow for the creation of.

Presentation Documents

The entirety of this project will be documented in my final presentation documents.

PRESENTATION INTENTIONS

Thesis Book

The final product of the thesis process that provides a record of all my work. Included it the thesis proposal, thesis research, design solution, and thesis appendix.

PowerPoint Presentation

This presentation will be used in the final presentation, see below, to assist others in understanding this complex project. Included on the board, but not limited to, are renders, spatial diagrams, charts, and plans.

Digital Animation

A short animation will help illustrate the spatial relationships within this project as well as the design of important community buildings. The viewer will witness the community organization while gaining a better understanding of passive design and its impact on the community.

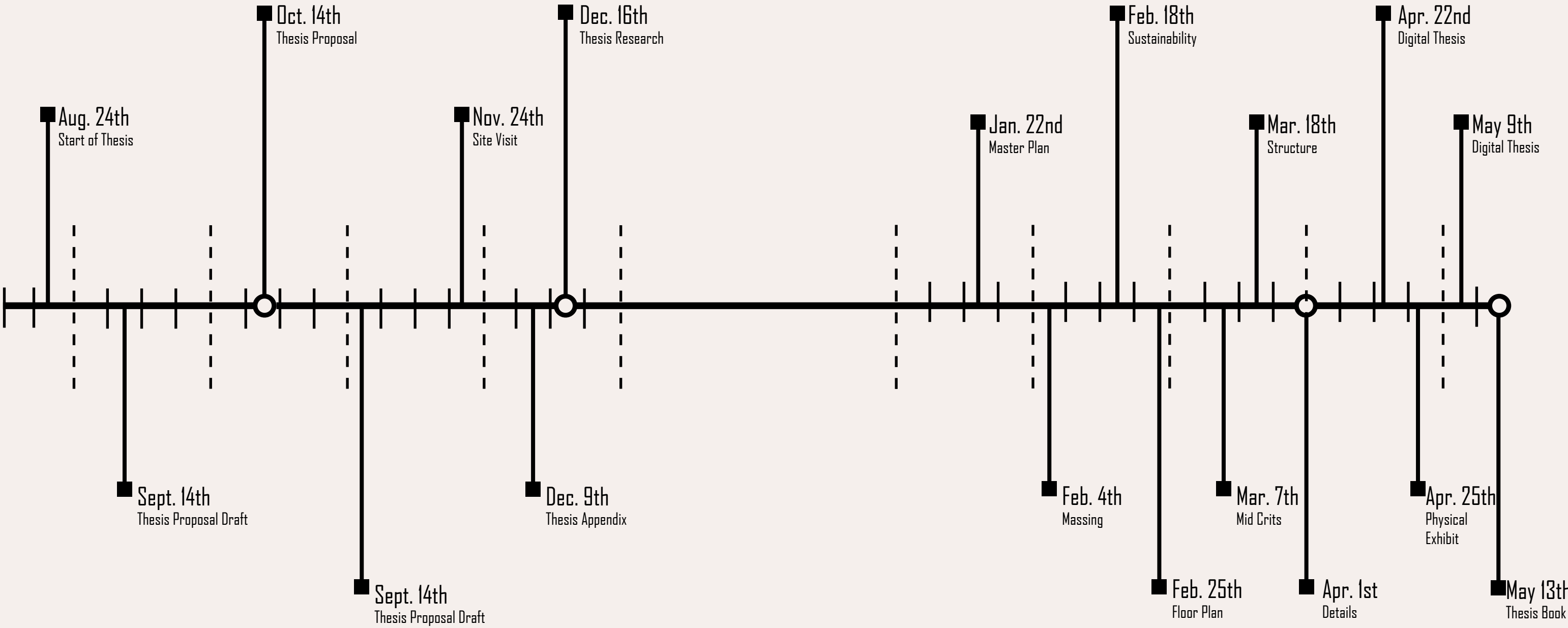
Final Presentation


All pertinent information displayed and explained through a graphic display but will be further discussed in a verbal presentation that helps expound on the ideas already explained visually.

Figure 23 | State Trust Land



SCHEDULE





THESIS RESEARCH

LITERATURE REVIEW

Neighbors & Neighborhoods

Elements of Successful Community Design

The Citizen Planning Series

An analysis at how neighborhood design affects its residents through social sciences and personal interviews. Through studies of multiple historic communities, the author defines what make neighborhoods a community instead of a geographical area. Looking through the lens of multiple professions, it explains how communities' physical elements, policies, and programming are created. Reading this book will create an understanding of how to create a community within a neighborhood on any scale, from a resident in the community to the designer of the community.

Community

Community is a unique form of association, it differs from other forms as it created behavior driven by a "sense of community." Members act out of a sense of "we-ness" rather than self-centeredness. This is because an individual's needs will be met within the community. These needs can vary from individual to individual but all have their needs satisfied by their membership in a community. The stronger the sense of community the more likely one is to participate in organizations, engage in local affairs, support social programs, and reduces their likelihood to commit a crime. Those who are more behavioral, such as those with children or married, tend to have a stronger sense of community. The elder also tend to have a stronger sense of community that youth. Those that share interests also tend to feel more connected within a community.

While some factors that drive a sense of community are social, there are certain characteristics that are physical such as homogeneity, organization, facilities, and physical setting. The physical environment in which a community resides can often define the boundaries of a community or encompass an area through physical characteristics such as roads or water. The facilities within this community can create social cohesion as those that use the same spaces tend to create interpersonal relationships based on those shared experiences. Spaces can be created to be used for a variety of activities and develop shared interests based off a common area.

As defined in this reading, there are 5 characteristics defined by Sidney Bower that are present in any community. Some are defined by social interaction while others are formed through shared history and experiences. While these characteristics are not defined by the space they occur in, they are influenced. Design has the ability to encourage or terminate these characteristics.

5 Characteristics of Community

All in the Same Place

The physical environment has distinguishable features that create a unique atmosphere that becomes a defining feature of the community.

All in the Same Boat

All residents of the community are affected by the decisions of the community. The actions of neighbors effect each other and therefore they all have an invested interest in the actions of the neighbors.

All of the Same Kind

Residents share a definable characteristic such as age, income, or ethnicity. Shared traditions and lifestyles connect residents with one another.

One for All

Membership in an organization that effects all within a community and engage residents such as a community committee or a homeowner association.

All in the Family

Traditions and history connect residents as stories are passed from one generation to the next. Stories and buildings are preserved as they a manifest of the sense of community.

Apperance on Community

The physical appearance of the built environment can have an impact on community. Uniform and homogenous design fosters a sense of community as it creates a connection in people's mind which tends to attract like-minded people. This results in people with shared definable characteristics being attracted to the area. One way to have the built environment reflect the community's values is to engage the residents in the design process. However, the physical appearance of a community is only manifestation of the community's values not the true community and should not be confused as so. One must rely on research and educated hunches to properly represent communities in the built environment.

Community Generating Neighborhood

Living in a neighborhood is not enough to create a community, shared space is not unto itself a community as some do not want to be part of a community. A community is a unified group of people. However, a neighborhood can have community-generating properties that fosters community and connectiveness within the community. Some neighborhoods serve its community better than others either through design or its social setting. As defined by Sidney Brower, there are ten characteristics that generate community. They support one another and can have a direct influence on the arrangement of a community. While these characteristics are needed to create a community, it is not always needed to sustain a community. These characteristics can be used in various ways to create various community types.

10 Properties of a Community Generating Neighborhood

It attracts people who are predisposed to getting along with one another

It has community organizations that serve as vehicles for collective action

It includes facilities such as stores, parks, plazas, and civic buildings that bring people together under conditions that are conducive to meeting and interacting

It triggers residents' collective memory

It is suitable size for a neighborhood-based community organization

It houses, spaces, and related uses are arranged in such a way as to facilitate social interaction among residents

It creates conditions under which individual residents stand to benefit from the success of and lose from the failure of the collective

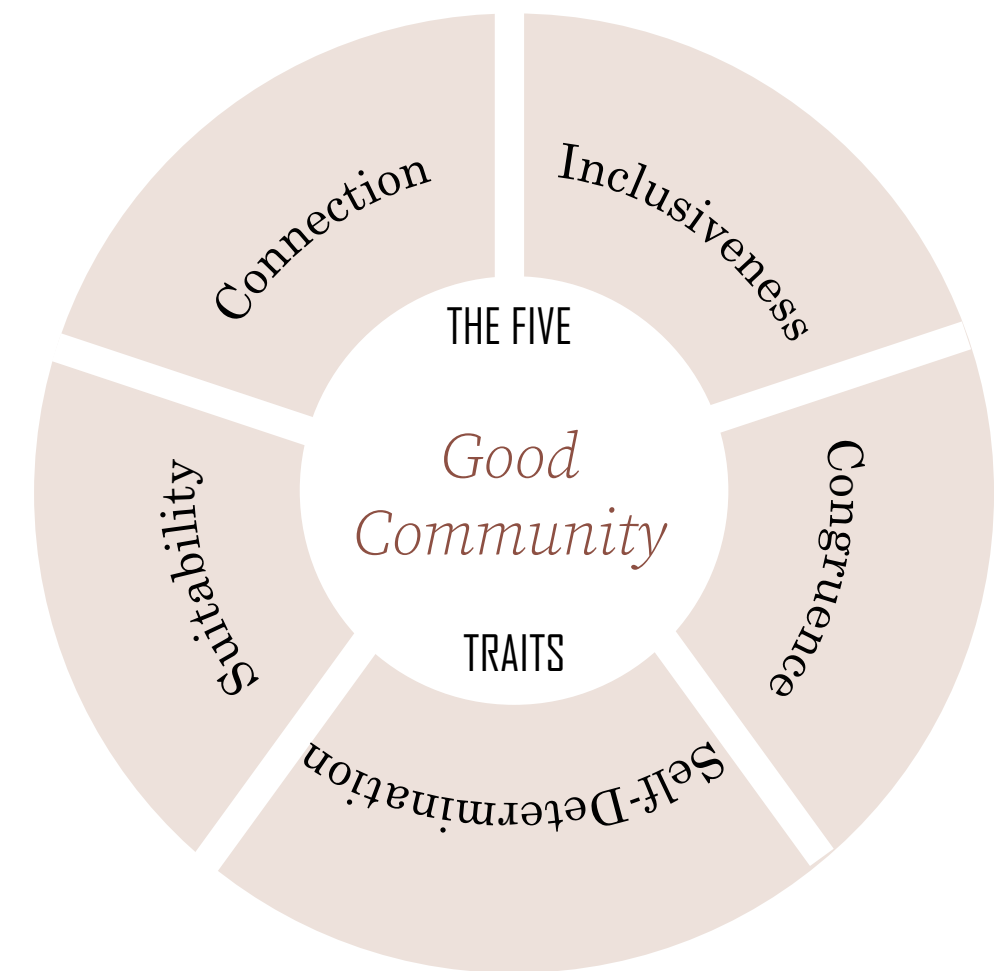
It encourages leisure-time use

It caters mostly to long-term residents

It has the appearance of community

Qualities of Good Community Design

A good community has a diverse population that engages in community affairs and has a strong sense of safety, comfort, and importance. Residents are able to have freedom as an individual while having a collective responsibility. It is a good place to age in place as there are opportunities to participate within the community with those of diverse background.



Chronic Illness

Impact and Interventions

The Jones and Bartlett Series in Nursing
Chronic Illness

Written for nursing and social work students, this book focusing on the many aspects of chronic illness and the impact that it has on both the patient and their families. It analyses the sociological, psychological, ethical, organizational, and financial impacts of chronic illness. It addresses and examines the daily struggles that arise with the presence of chronic illness. It combats the stigma of chronic illness and the tendency for medical professionals to view patients as the status of their disease by presenting the framework to view the patient as a whole.

Defining Chronic Illness

Our current medical system is designed not to prevent chronic illnesses but instead to treat them as if they were an acute illness by treating the systems and occasionally finding a cure. Medical research is often focused on finding the causes of acute diseases and advance treatment even though chronic illness is a larger health problem than acute illness. People are subject to the costly consequences of the current health care system which can lead to lack of care, premature disease progression and being forced into costly institutional care before it is needed. All this because the modern health care system tries to treat chronic illness as if it was an acute illness. There is a distinguishable difference between an acute illness and a chronic illness. One must understand the difference to provide those with chronic illness the care and assistance that they need. Acute illness has a sudden appearance with symptoms that directly relate to the disease. The illness is typically short and results in a complete recovery with a return to normal life activities. Chronic illness is quite different as there is no way to know if or when one might recover. It becomes a part of everyday life and often times becomes the sufferer's identity. There are many forms of chronic illness as some appear suddenly while other gradually appear over time. Some have flare-ups while others go into periods of remission for extended periods. Even in remission, chronic illness can require strict regimens and ongoing medical treatment. Due to the variance between chronic illnesses, it can be hard to full define what a chronic illness is. There have been many definitions throughout history with many focused on the permanency and care of the diseases. Some define chronic illness as one that exceeded a certain time frame of treatment or hospitalization. The severity of chronic diseases also complicates the definition of chronic illness as it is hard to measure the effect of a disease as it may affect suffers differently due to various statistical differences such as age. However, one aspect of chronic illness that is agreed upon by all is that it is

never cured and are not completely preventable. As people age, their bodies age and eventually begin to fail. For this reading, there was an analysis on multiple definitions of chronic illness from numerous esteemed sources and why their definition fails to properly represent chronic illness. The author offers their own definition as “the irreversible presence, accumulation, or latency of disease states or impairments that involve the total human environment for supportive care and self-care, maintenance of function, and prevention of further disability.”

Disease vs Illness

While many do not distinguish a difference between illness and disease, there is a difference though they can be used interchangeably in most situations. Disease is the problem that a medical provider is trying to solve. It is views as a variation in structure or performance. Illness is more personal, it is the experience of the effects of the symptoms. It is the perception of a disease that one lives with and is perceived by the sufferer and others.

| TAS E 1-1. Definitions of chronic illness | | | |
|---|---|---|--|
| Author | Definitions | Advantages | Disadvantages |
| Commission of Chronic Diseases (1949) | All impairments or deviations from normal that have the following characteristics: permanent, residual disability caused by nonreversible pathological alteration, require rehabilitation, and may require a long period of supervision, observation, or care | Concise Generally applicable | Patriarchal Medicine-based interventions Not flexible Unilateral approach |
| National Conference on Care of the Long-Term Patient (1957) | Requires a continuous or prolonged period of care, at least 30 acute hospital days, or 3 months of medical supervision and/or rehabilitation in a different setting [summarized] | Gives definite time dimension | Primarily based on hospital settings How much intervention emphasizes shortening hospital stay and preventing exacerbations |
| Abram (1972) | An impairment of bodily function over a period of time requiring general adaptation [summarized] | Behaviorally oriented Concise | Too brief |
| Feldman (1974) | Ongoing medical condition with spectrum of social, economic, and behavioral complications that require meaningful and continuous personal and professional involvement [summarized] | Directs attention to context of all human involvement Provides sound basis for intervention by all disciplines | Complex More cognizant of caretaker's than client's role |
| Buergin et al. (1979) | Symptoms and signs caused by a disease within a variable period of time that runs a long course and from which recovery is only partial | Concise Radical | Disease-oriented |
| Cluff (1981) | A condition not cured by medical intervention requiring periodic monitoring and supportive care to reduce the degree of illness, maximize the person's functioning and responsibility for self-care [summarized] | Puts person with chronic illness into a major self-care role Flexible Includes other disciplines subtly Defines role of medical intervention | Somewhat medically oriented |
| Mazzuca (1982) | A condition requiring a high level of self-responsibility for successful day-to-day management [summarized] | Acknowledges role of self-help Futuristic | Too brief |
| Verbrugge (1982) | A degenerative illness | | Too simplistic |
| Bachrach (1992) | Refers to individuals who suffer major mental illness experiences resulting in severe disabilities for long periods, or lifetime | Homogenization of the diverse for facilitation of policy development and service planning | Mental health oriented Application of term may suggest hopelessness and invite stigma |

Figure 23 | Chronic Illness Definitions

Impact of Chronic Illness

The impact of chronic illness is extensive from social and psychological to physical and economic effects that often occur in a cyclical manner. The various impacts of the illness can increase the severity of others, such as the physical effects of the illness worsening the economic impact. The progression of an illness can burden the sufferer, their family, their community, and on their life. Some sufferers can become dependent on others for the first time since childhood or may never be able to achieve independence due to the severity of their illness. Learning to live with a chronic illness requires one to believe that a meaningful quality of life is worth the struggle. The impacts of the chronic illness can vary throughout the life of the sufferer and is constantly involving. For this review, the impact of chronic illness has been summarized by age groups.

Infancy Through Adolescence

Chronic illness is more prevalent in children than acute illness but many of the chronic illnesses are not severe enough to need specialized medical care. It can create multiple considerations for long-term health care as there are additional economic, psychological, and social demands both on the sufferer and their family. Parents must not only manage the regular developmental needs of their child but must also manage the additional needs of their child's chronic illness. This results in parents having to balance the regular development of their child with the management of their child's illness. The child with a chronic illness also faces a balancing act of normal childhood development and the impact of a life with limitations.

Common Opposition Struggles For Parents

The child's need to socialize and explore versus health risks and consequences

The child's need for appropriate limits versus the desire to "make up" for the illness

The needs of other family members versus time and financial resources consumed by the illness

The child's natural process of becoming independent versus the need for increased supervision

The natural experimentation of childhood versus the limitations of the illness and physical vulnerabilities

The role of spouse versus the role of parent

Parents as medical monitors, service seekers, and medication givers versus the advice of professionals

The need for the child to become responsible versus extra attention and reduced expectations that come with being sick

Adulthood

The beginning of adulthood is a time when careers start, marriages are formed, and families begin. It's a time where one sets up the basis of their financial future. It is also the time when chronic illness can complicate the life goals one has. Energy and resources that should be used to achieve their goals are being used to cope with illness. In a time when most of society expects one to be productive and active, it can be frustrating to living through uncertainty. Everyone gives suggestions or tells the sufferer "just get out and be with people" that only furthers to frustrate and isolate the sufferer. Society fails to understand that there can be uncertainty with illness even though modern medicine has created an expectance of absolutes in regard to the treatment and progression of disease.

As one ages, more adults begin to have chronic illness as is expected with aging bodies. It is common to be diagnosed with multiple chronic illness as one continues to age. New issues arise with chronic illness in old age as the elder can once again find themselves alone for the first time in decades. This can present more issues than with younger sufferers as the elderly tend to be less assertive and less well educated. The elderly also face stigma of both age and chronic illness as society often view both as the economic burden they have on the economy. The odd of full recovery is low as one ages and therefore are viewed less desirably while also receiving a lower quality of care than their younger counterparts. Medical care is often chosen based on economic decision making which leaves the elderly at risk for a lower quality of life.

Literature Review Summary

The research completed in this section was intended to further my knowledge and understanding of both planned communities and chronic illness. I studied two of the main focuses of my project: community design and chronic illness. I chose to study each separately as there are no past research that explains the impact of one on the other. By analyzing and researching each topic separately I am able to gain a better understanding of the influences on and impacts by each subject. By studying planned communities, I have learned what the qualities of good community design are as well as community generating properties. These principles on good community design will be directly applied to the master planning of my project to create a design that fosters community and connects people. To create a sense of community, I will cater my designs to select group of people with shared interests which will therefore attract that people group. This is one of the multiple principles that I will apply to my project as a direct result of my readings. Research completed on chronic illness has further expanded my knowledge past the personal experiences I had before this project began. The emotional and mental strain of chronic illness can often be as hard to manage as the illness itself. Offering support through physical environments and the encouraging of community is one method to serve those with a chronic illness. This, along with methods to support care givers, has been one of the main takeaways from this research.

Additional Research Opportunity

Due to the large scope of this project, there is a large amount of research that could be done. With that in mind, I have additional readings that I can reference throughout the design process. These reading while beneficial to the design, may not have warranted a literature review due to the format of the reading such as being a guide for design guide. These readings will be applied during the design process with the organization of the site, application of climate-appropriate passive systems, and local material selection.

Readings

Plants for Dry Climates : How to Select, Grow, and Eejoy
Duffield, Mary Rose.; Jones, Warren D.

Stay cool : A Design Guide for the Built Environment in Hot
Climates
Koch-Nielsen, Holger.

Visions for a new American Dream : Process, Principles, and an
Ordinance to Plan and Design Small Communities
Nelessen, Anton C.

Design Primer for Hot Climates
Allan Konya

PRECEDENT RESEARCH

Community Design

Civano | Tucson, Arizona
Acrosanti | Acrosanti, Arizona
Serenbe | Chattahoochee Hills, Georgia
Mesa Del Sol | Albuquerque, New Mexico

Medical Facility

Children's Hospital of Pittsburgh | Pittsburgh, Pennsylvania

Medical Facility

Palo Verde Library/Maryvale Community Centre | Phoenix,
Arizona



CIVANO

Typology: Planned Community
Location: Tucson, Arizona
Designer: Moule & Polyzoides Architects & Urbanists
Status: Completed 1999
Size: 820 Acres

Figure 24 | Civano

“A model of green design in a desert environment, Civano New Town is sited on 1,100 acres in the Sonoran Desert. It anticipates over 2,800 households, 1.3 million square feet of commercial space and, in a dramatic departure from the typical development in the region, the plan includes strategies for conservation, restoration of the native riparian habitat and the stewardship of natural resources.”

– Moule & Polyzoides

Program Elements



Livable Streets

Community School



Figure 26 | Community School



Figure 27 | Retail

Retail

Affordable Housing



Figure 28 | Housing



Figure 29 | Plant Nursery

Plant Nursery

Urban Impact



Figure 30 | Civano Park

Civano is Tucson's first New Urbanist neighborhood that was the largest high-performance, mixed-use community of its time. The community became a pilot project for sustainable urban design with a focus on reducing energy and water usage. Even with promise of innovation, the project was initially met with criticism as the project required a large financial contribution which set it apart from previous developments. Due to the land that Civano sits on being donated by the State Land Department, the planning process

relied heavily on public involvement. This involvement led to analysis of multiple project aspects such as marketability, energy use and resource conservation. With the involvement of the public and the use on innovative science, the community became an example for sustainable city planning which was explained in the community's manifesto.



Figure 31 | Civano Master Plan

“The goal of the Civano project is to create a mixed-use community that attains the highest feasible standards of sustainability, resource conservation, and development of Arizona’s most abundant energy resource—solar—so that it becomes an international model for sustainable growth.”

– Civano Memorandum of Understanding



Figure 32 | Civano Homes

Environmental Impact

“The development of the Village of Civano is an attempt to demonstrate our ability to accomplish the broad goals [of] the use of the sun as our primary source of energy; the conservation and multiple uses of water; the configuration of uses on the land which minimizes the use of fossil fuel- and time-consuming automobile travel; the reduction of waste in both product and time; and the development of a sense of community, social interaction, and place.”

– Civano Memorandum of Understanding

Civano was not only known for its use of New Urbanist principals but also for its innovation in sustainable urbanism. The community has 650 resource-efficient homes, low-water desert landscaping, and the “greenest” school in the United States. The planners integrated the Sonoran Desert into the community with trails, native landscape, and public spaces. During the planning process, the city moved from a focus on solar power to a focus on sustainability as a whole. However, the city has had some struggles with lack of transit, its distance from downtown Tucson, and has had issues with keeping retail in the city center.

Innovation



Civano was an innovation of its time for both urban plan and architecture. It was called the most environmentally advanced community in North America during its construction and is arguably still the most environmentally advanced. One notable innovation was the creation of the development's first wastewater treatment plan to reuse the water for irrigation. The community also innovated the way that residents can live with Civano providing many jobs for residents, reducing reliance

Figure 33 | Civano Landscaping

Design Goals

1. Reduce home energy consumption by 50 percent over the 1995 model energy code.
2. Reduce potable water consumption by 65 percent.
3. Reduce internal vehicle miles driven by 40 percent.
4. Create one job on-site for every two residences.
5. Reduce landfill-destined solid waste.
6. Provide 20 percent affordable housing.



ACROSANTI

Typology: Planned Community
Location: Acrosanti, Arizona
Designer: Paolo Soleri
Status: Constructed 1970, 5% completed
Size: 25 acres

Figure 34 | Acrosanti

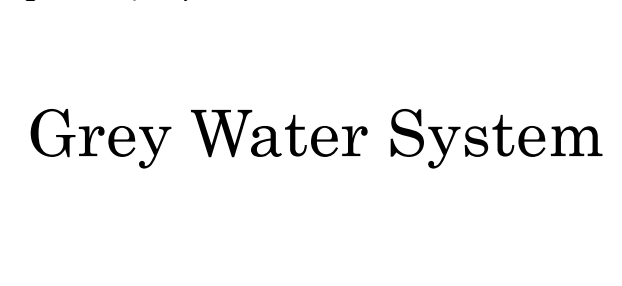
“In 1970, The Cosanti Foundation began building Arcosanti, an experimental town in the high desert of Arizona, 70 miles north of metropolitan Phoenix. An ambitious project envisioned as an experiment in living frugally and with a limited environmental footprint, Arcosanti is an attempt at a prototype arcology, integrating the design of architecture with respect to ecology. Based on a set of four core values that include Frugality and Resourcefulness, Ecological Accountability, Experiential Learning, and Leaving a Limited Footprint. The Cosanti Foundation operates Arcosanti as a counterpoint to mass consumerism, urban sprawl, unchecked consumption of natural resources, and social isolation.”

– The Cosanti Foundation

Program Elements



Amphitheater



Grey Water System



Figure 36 | Grey Water System



Guest Rooms

Figure 37 | Guest Rooms



Greenhouse



Figure 38 | Greenhouse



Agriculture

Figure 39 | Agriculture

Urban Impact



Figure 40 | Acrosanti Hillside

Soleri began Acrosanti as an “urban laboratory” to better understand alternative ways to live other than in the urban sprawl that was prominent in the 1970s. The principles at the time contradicted the ideas of Frank Lloyd Wright which were prevalent and popular at the time. He called his new ideas, arcologies which is the blend of “architecture” and “ecology.” The purpose of this built architectural experiment was to make humans more in harmony with nature. Energy usage should be minimized while human interaction was maximized. Part of that effort also meant that transportation

was to be efficient and used minimally. The community itself was designed and built to be efficient in many aspects, such as energy usage and commuting time. There are no roads, which is a stark contrast to the modern American city, which gives the city back to the people and turns it into a walking city. Acrosanti aims to integrate residents’ work and personal life with communal spaces and interaction with the landscape, taking inspiration from Italy’s many villages.



Figure 41 | Acrosanti View

“The problem I am confronting is the present design of cities only a few stories high, stretching outward in unwieldy sprawl for miles. As a result, they literally transform the earth; turning farms into parking lots, wasting enormous amounts of time and energy transporting people, goods, & services over their expanses. My solution is urban implosion rather than explosion.”

– Paolo Soleri

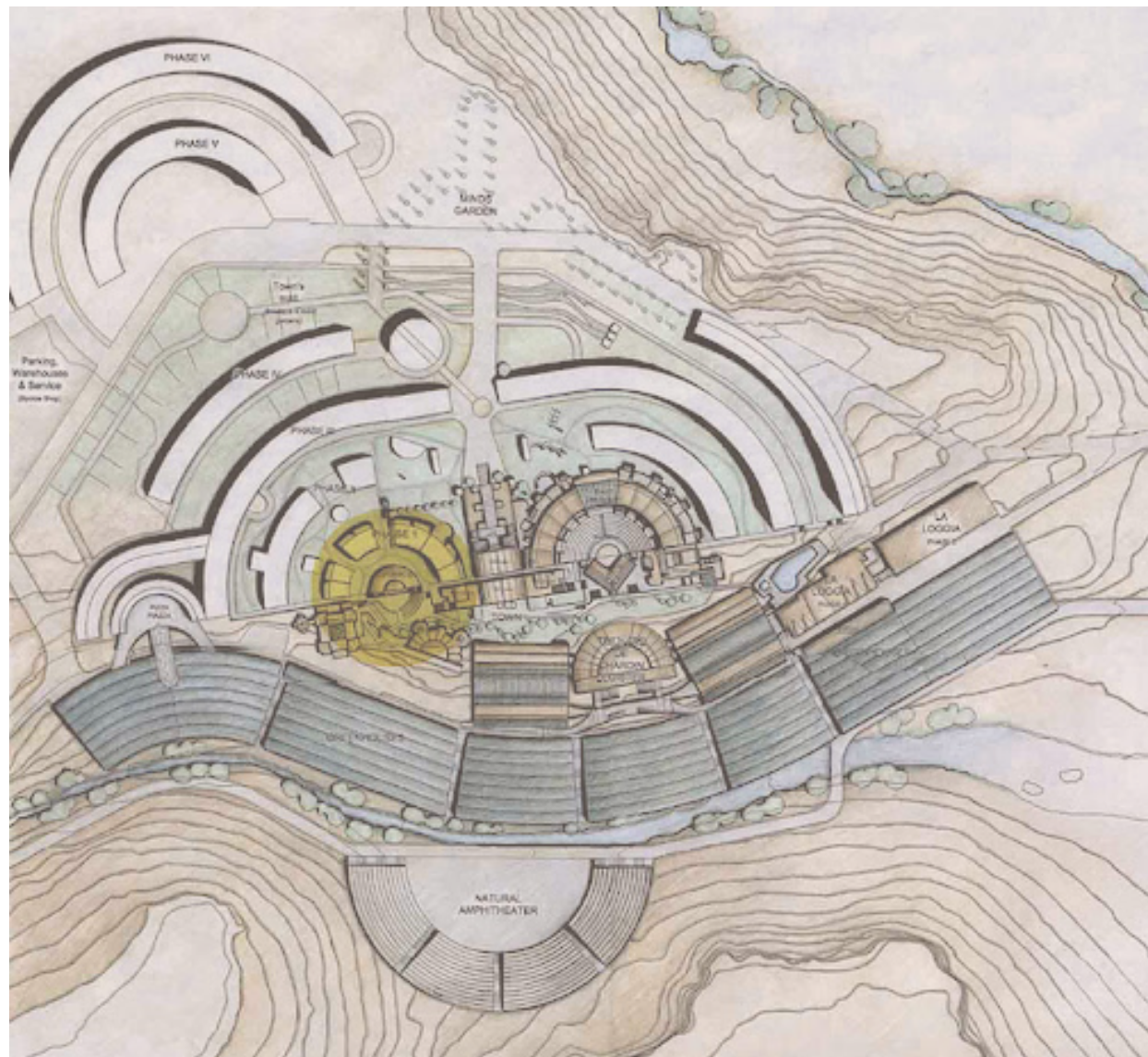


Figure 42 | Arcosanti Master Plan

Environmental Impact

“It is only logical that the pauperization of our soul and the soul of society coincide with the pauperization of the environment. One is the cause and the reflection of the other”

-Paolo Soleri

As an urban experiment that Paolo Soleri spent most of his life working on, the city was designed to maximize social interaction while minimizing energy use and transportation. The positioning of buildings is based on energy performance and utilization of solar energy, not to simply conform to the Jeffersonian grid. Buildings and windows were placed in accordance with sun angles to such a precision that on Winter Solstice, the sun shines into some perfectly placed windows. The overarching principle throughout the site is the preservation of nature and the reduction of urban sprawl. Over fifty years after the creation of Arcosanti, many of the principles that were the foundation of the community are now common in mainstream architecture and urban planning.

Innovation



In a time that photo-voltaic technology was recently discovered and not yet trusted by most builders, Soleri made the choice to incorporate solar energy into his futuristic city. Solar panels were not easily accessible to the general homeowner and there were no federal tax incentives for their use until almost a decade later. This did not deter Soleri from using it in his attempt to minimize humankind's reliance on unsustainable energy. Many other innovations were used throughout the site, many of which Soleri himself created. Acrosanti was not only a place of scientific innovation, it was also a place of social innovation. Decades before the green movement and half a decade before the word "global warming" was coined, a community was born for people that shared the same concerns about humankind's effect on the earth. The entrance of the community proudly declares the residents' shared passion with a sign that states: "If you are truly concerned about the problems of pollution, waste, energy depletion, land, water, air and biological conservation, poverty, segregation, intolerance, population containment, fear, and disillusionment, join us."

Figure 43 | Acrosanti Cafe

Design Goals

1. Reduce Urban sprawl by designing in and up.
2. Be a teaching experiment that influences future designers
3. Redefine the American Dream to redefine the infrastructure of America.
4. Leave a limited footprint.
5. Preserve natural resources.



SERENBE

Typology: Planned Community
Location: Chattahoochee Hills, Georgia
Designer: Planning & Design at Serenbe
Status: Construction started 2004 and ongoing
Size: 660 acres

Figure 44 | Serenbe

“Serenbe is an award winning biophilic community that connects people to nature and each other. Each of Serenbe’s hamlets have complementary commercial centers focused on the elements of a well-lived life: arts for inspiration, agriculture for nourishment, health for wellbeing and education for awareness. Fresh food is another of Serenbe’s natural assets, with a 25-acre organic farm, seasonal Saturday Farmer’s Market, thriving CSA program and edible landscaping, including blueberry bushes along paths and sidewalks... Serenbe is a place you can enjoy for a meal, a weekend or call home for a lifetime.”

– Steve Nygren

Program Elements



Organic Farm

Nature Preserve



Figure 46 | Nature Preserve



Figure 47 | Commercial

Commercial

Specialty Neighborhoods



Figure 48 | Specialty Neighborhoods



Figure 49 | Inn

Inn

Urban Impact



Figure 50 | Serenbe Farm

Serenbe was named after the site's serenity and is an example of new urbanism. The community is divided into hamlets that each focus on different specialties such as the arts and agriculture. To encourage walking and community, homes only have front porches and instead of backyards have common green space. 70% of the community is protected from development which creates a modern urban village that utilizes new urbanism principles to protect the natural landscape in the area. This planned community is different than most as even though it was prominently funded by a development company, it does not have the feel of a dystopian movie where every house looks the same. This quickly

developed community offers a variety of living options. Residents have the option to rent, buy, or build. Existing options include condos, townhouses, single family homes, and even 10-acre homesteads. Future plans include assisted living and dorms to further diversify the community. With multiple architectural styles and options for almost any income level, the planners created a diverse planned community that looks as if it developed over decades rather than a few years.



Figure 51 | Serenbe Potluck

“Serenbe is reminiscent of communities of yesteryear, when life was simpler. Community is important to our residents, as is minimal mental stress and optimal physical health. It’s a laid-back lifestyle just 40 minutes from a major urban center and one plane ride away from the capitals of the world”

– Steve Nygren

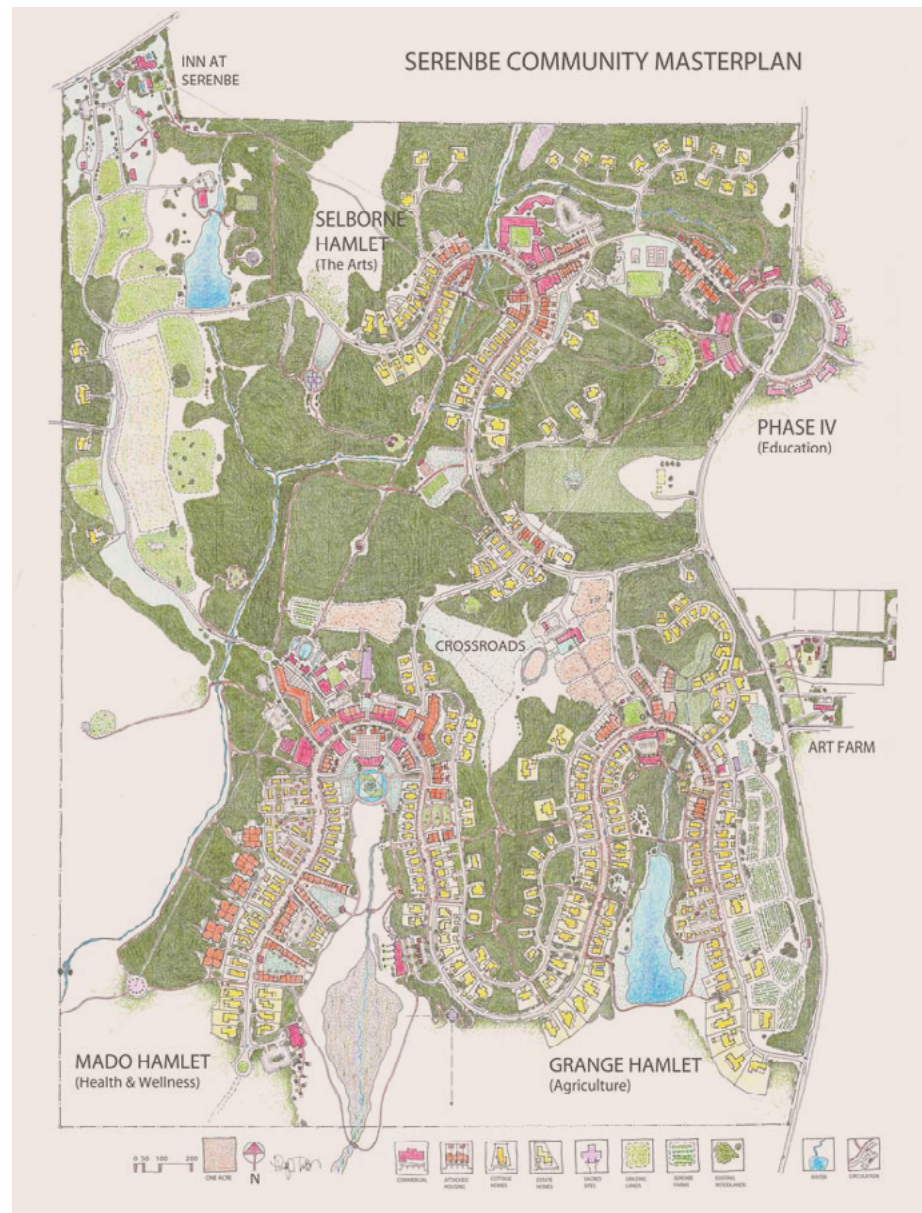


Figure 52 | Serenbe Master Plan

Environmental Impact

“They say that if you want to change the world, you should start in your own backyard. If that’s so, then Serenbe is quite a beginning. At Serenbe we value nature, passion, creativity and community. We believe people can live more fully when connected to the wonder of nature. We value people for who they are, not what they are or what they do. This is a community where people live, work, learn and play in celebration of life’s beauty. A place where connections between people, nature and the arts are nourished.”

– Steve Nygren

Serenbe was designed as a wellness community that wanted to connect nature. Driven by the desire for fresh food and fresh air, the community set aside 70% of its land to be preserved as the forests and meadows they currently are. The founder calls Serenbe an “intentional community” devoted to improving both the environment and its residents’ well-being. The majority of the community is geothermally powered with native landscaping, most of which is edible, which makes the



cost of living much lower and more environmentally friendly. Noise pollution is banned with only electric vehicles allowed inside the development. The community of 750 residents follows sustainable building practices and mostly self-sufficient in an idyllic area outside of Atlanta, a city known as being highly unsustainable, sets an example for future development.

Figure 53 | Serenbe House

Innovation

“I came to Serenbe to observe the transcendentalist antidote it offers to the modern ills that plague many Americans....At Serenbe, you don’t have to try so hard. A balanced life can be your full-time reality. You can drive 40 minutes to work in the city and return to the community’s idyllic confines in the evening. You can replenish yourself with hyper-local vegetables and woodsy hikes without sacrificing your livelihood or access to cosmopolitan life.”

– Carrie Battan

This community is innovative in its overall design due to its focus on well-being. Where one lives can have a huge impact on one’s health and the planners of Serenbe took this into account during the planning phase. Wellness is a whole-body concept, with physical, mental, and social aspects. The community is designed to maximize social interactions while minimizing the stress of large city living. The community contains a farm that offers residents organic food that would be hard and expensive to find elsewhere and much of the landscaping is edible. All aspects of Serenbe innovate the idea of a planned community by creating an “eco enclave” that offers a new and sustainable take on what could have been a bland, cookie-cutter community. Unlike many planned communities, Serenbe is a very diverse place to live with residents ranging from single twenty-year-olds to retired grandparents.



MESA DEL SOL

Typology: Planned Community
Location: Albuquerque, New Mexico
Designer: D/P/S Design
Status: Expected completion 2045
Size:

Figure 54 | Mesa Del Sol

Mesa del Sol is a community designed for Albuquerque’s southeast mesa, south of the Sunport. Mesa del Sol will be a community where history and tradition meet the 21st Century. Combining job creation and sustainable urban community planning, Mesa del Sol will reflect a balance of environmental resources, economic objectives and social amenities in a community that is forward looking with a highly defined sense of place. Mesa del Sol’s Level A Master Plan is different from past plans submitted to the City of Albuquerque, incorporating the principles of the City of Albuquerque’s Planned Growth Strategy (PGS), complying with Albuquerque’s Planned Communities Criteria and incorporating the most important planning movement of the 21st Century, New Urbanism. The project, pursuant to the Planned Communities Criteria and annexation agreement with the City of Albuquerque, will be developed at no net expense to the City. The plan reflects a practical approach to growth that offers convenience, economic development and a high quality of life

– Mesa Del Sol

Program Elements



Figure 55 | Aperture Center

Aperture Center

Fitness Center



Figure 56 | Fitness Center

International School



Figure 57 | International

Amphitheater



Figure 58 | Amphitheater

Biking Trails



Figure 59 | Biking Trails

Urban Impact

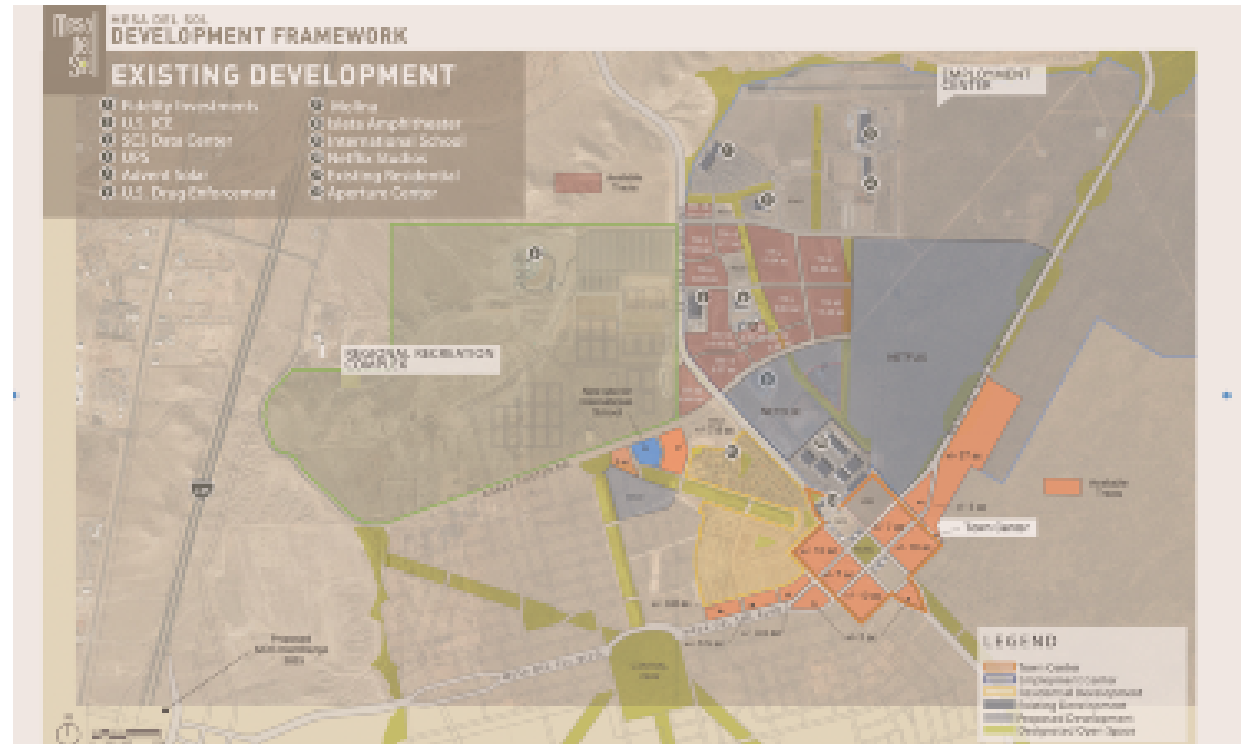
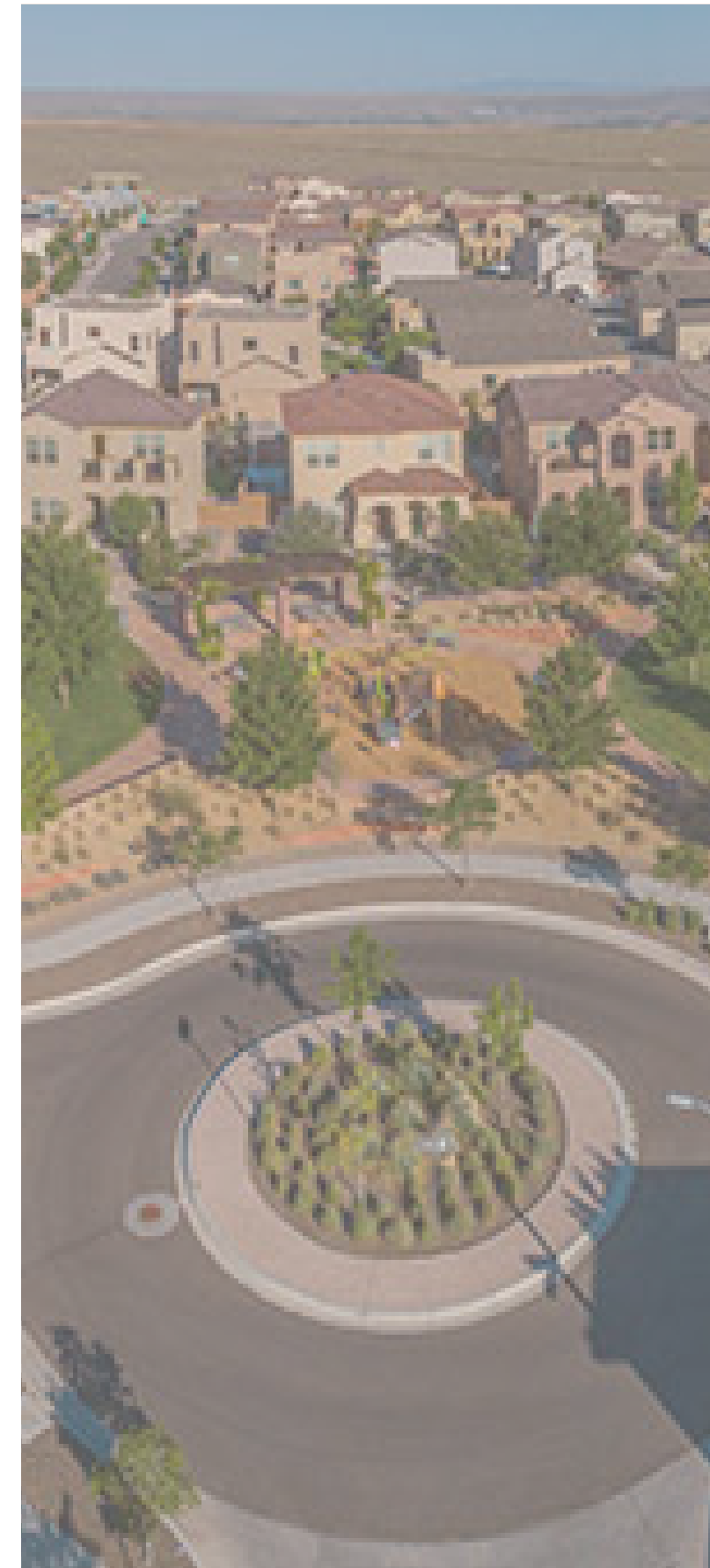


Figure 60 | Mesa Del Sol Master Plan

As the planning of Mesa Del Sol, the planners had 4 guiding ideas: microgrid technology, cohesive infrastructure, smart transportation, and community planning. These four ideas were chosen to connect people, information, and technology to improve the lives of residents. The desire for high-quality education and ample job opportunities has led the community to be home to emerging tech companies and numerous research efforts. This community is different from most planned communities

due to its attempt to innovate living with technology. While many of its attempts to incorporate technology are still in the making, it has the opportunity to be one of the most technological advanced communities constructed as much of the city's job opportunities are in the technological field. With this community still under construction, it has an opportunity to be an example in how to incorporate technology and innovation into the modern urban design process.

Figure 61 | Mesa Del Sol Houses



“Albuquerque is arguably the city with the greatest potential in all of America for growth, development and sustainable living. And there is one area of our city that is particularly suited to realize and sustain that potential: Mesa del Sol. The master-planned community in Albuquerque’s southeast corner is now an area with active commercial and residential growth, active construction of new, modern homes, and incredible development progress... Without a shadow of a doubt, I know that Albuquerque and the State of New Mexico are destined for greatness. We are moving forward, working together and achieving great things. Yes, we still have work to do. Yes, some obstacles are harder than others. Yes, we can do this. We are strong. We are #NMTrue. And we will realize this vision of greatness at Mesa del Sol that will elevate to the next level not only the city of Albuquerque, but also the State of New Mexico. It’s time to resurrect the challenge at Mesa del Sol, and shine our light for all the nation to see.”

– Steven Chavez

Environmental Impact

“With environmental sustainability and resource preservation at the core of our development choices, we’ll approach Mesa del Sol planning using a method called geodesign. In this practice, we can responsibly manage natural resources while considering the future impact of population growth in the area—and the carbon footprint we’ll leave behind for future generations. This community is better positioned to provide citizens a sustainable future that won’t compromise the land, water or air quality essential to our lives.”

The designers of Mesa Del Sol made environmental sustainability as a central principle of the community and they did so through geodesign, which combines landscape architecture, design, geography, and spatial science to create optimal solutions within the built environment. The community uses geodesign to manage their resources in a way that considers the needs to the future residents and

Innovation



the possible growth in the area. They also utilize clean energy and natural landscape to preserve the green space within the community from pollution and overuse.

Figure 62 | Aperture Center



Figure 63 | Aperture Center

Instead of using design and policy to reduce crime, this community utilizes technology to attempt to reduce crime. Public spaces are monitored by smart cameras that monitor pedestrian activity, analyze traffic levels and patterns, and have speakers that offer distress assistance. Another new piece of technology that is being developed and implemented is asset tracking, which can monitor who is coming and going which helps identify those that are a threat to residents. The use of new technology is common in this community and is constantly being developed and implemented. It is an on-going experiment on how modern technology can change how people live.



CHILDREN'S HOSPITAL AT PITTSBURGH

Typology: Planned Community
Location: Chattahoochee Hills, Georgia
Designer: Planning & Design at Serenbe
Status: Construction started 2004 and ongoing
Size: 660 acres

Figure 64 | Children's Hospital

Children’s Hospital’s philosophy goes beyond the construction of sustainable buildings and extends into operating the facility with green practices wherever possible. This requires environmentally sustainable operating policies and procedures in areas of facility maintenance, housekeeping, food service, and waste management to name a few. In addition to buildings and building operations, it is Children’s goal to foster a green philosophy by engaging in active clinical programming and by partnering with various community and academic organizations to conduct research on the subject of sustainability and effects on the health of children.

- UPMC

Program Elements



Patient Rooms

Exam Rooms



Healing Garden



Information Desk



Community Room



Architectural Impact



Figure 70 | UMPC Campus

This hospital has won numerous awards not just for its medical care but also for its design and its attempt to be a truly “green” hospital. Originally the site was home to St. Francis Medical Center but was bought by UMPC which chose to renovate many of the existing buildings and adding on to the hospital. The project was unique as it blended the old and new into what is now what is called one of the most beautiful hospitals in the United States. A local newspaper even went as far to call in “a national and international treasure.” It is not only beautiful but also the first LEED Certified children’s hospital and was one of the first children’s hospitals to create a family-centered care model. The design of the hospital

allowed both patients and their families a sense of home with more privacy and many amenities of home. Rooms give patients more control over their environment from lighting to bed height. Previously, hospital environments were extremely controlled even in private rooms but through collaboration between medical professionals and designers a new model for patient care was created.



Figure 71 | Healing Garden

“As a partner, through groundbreaking research, innovative design, and dedication, CannonDesign exceeded our expectations in designing a world-class facility that has enhanced the healing environment and will positively impact patient outcomes for generations to come.”

– Roger A. Oxendale, Former CEO



Figure 72 | UPMC Exterior

Environmental Impact

“Children’s Hospital of Pittsburgh of UPMC is designed as a “green” campus, meaning that buildings use key resources such as energy, water, materials, and land more efficiently than buildings erected simply to building code. It’s been established that green (or environmentally sustainable) buildings contribute to improved health, comfort, and productivity of their residents by utilizing more natural light and promoting better air quality.”

– Roger A. Oxendale, Former CEO

: As the first LEED Certified children’s hospital in the United States this project has a focus on being as efficient as possible with resources such as energy, water, materials, and land. The new portions of the hospital use more natural light and have better air quality than standard hospitals to improve occupant health and comfort. The building has a utility utilization system that measures the building’s performance to ensure that all systems perform as efficiently as they were planned to be.

Innovation



While these efforts effect the ongoing sustainability of the building, many of the project's attempt to be more "green" occurred during construction. Designers made an effort to chose local materials that reduced transportation and used 100% post-consumer recycled structural steel. HCFCs and halon were completely eliminated while vinyl and mercury-containing products were used minimally in conjunction with low VOC materials to improve air quality. All these efforts and more reduced the environmental impact of the hospital both during construction and into the future.

Figure 73| UMPC Exterior



Figure 74 | UMPC Nighttime

Placed in a densely populated area that was surrounded by mostly residential, there were concerns over the size limitations on the site. Needing the serve the needs of a fastly growing hospital, the issue arose of how to fit all needed spaces onto the site while still creating an environment that would serve the needs of children and their families. The designers used collaboration with medical providers and the utilization of the new family-centered medical care philosophy to create a new kind of children's hospital.

PALO VERDE/ LIBRARY MARYVALE COMMUNITY CENTRE

Thesis Research | 117



Typology: Community Center and Library
Location: Phoenix, Arizona
Designer: Gould Evans and Wendell Burnette Architects
Status: Completed 2005
Size: 46300 square feet

Figure 75 | Maryvale

“The Palo Verde Library and Maryvale Community Center is a multi-use facility that includes a large public library collection area, a 150-seat auditorium for recital, drama and public lectures, and a community center that includes a park, pool, basketball courts, running track, and gym. The design intention was to discover a way to maintain the existing recreational park all the while providing a building that energized the surrounding community.”

- Gould Evans and Wendell Burnette

Program Elements



Figure 76 | Library

Library

Youth Lounge



Figure 77 | Youth Lounge

Gym



Figure 78 | Gym

Park



Figure 79 | Park

Pool



Figure 80 | Pool

Architectural Impact



Figure 81 | Maryvale Community Center

A major consideration in this project was the preservation of an existing recreational park while creating a more prominent civic presence in the area. The solution was preserving one corner of the park while using the rest of the site for a library and community center. Yet, designers felt that simply preserving the park and placing a large building on the rest of the site was enough. They wanted it to feel as if the park crossed the site and was connected to the new buildings. This was achieved by having the upper portion of the building being a solid mass with metal paneling that reflects the surrounding landscape while the lower portion is a band of glass that encourages interaction with the surrounding landscape. The

community center and library became a quick success and helped connect the community with the previously lifeless park by utilizing site-specific design



Figure 82 | Palo Verde Library

Awards

2009 AIA/ALA Library Building Honor Award
2007 National Honor Award
2006 Merit Award - AIA Western Mountain Region

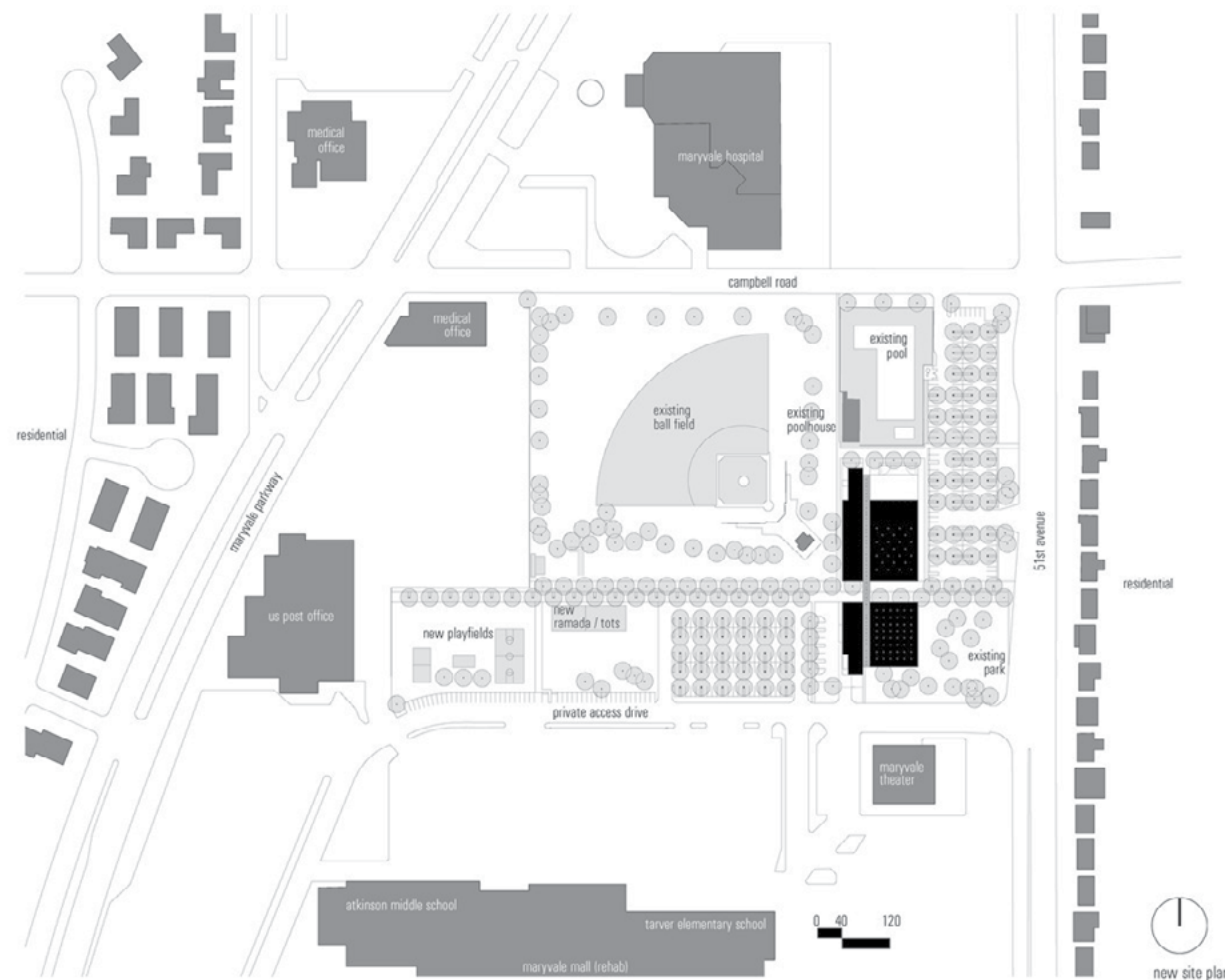


Figure 83 | Maryvale Master Plan

Environmental Impact

“The building simultaneously reads as bold and quiet, there and not there, while recording the range of light - a true response to our unique Arizona climate. This project demonstrates an approach to site-specific design - the ability of the design team to carefully consider the context of the site from many different scales, and respond to the unique circumstances of climate, views and open space.”

– Gould Evans

In a city with rising average temperatures due to heat island effect, the preservation and integration of green space on the site helps counteract the effects of the expansive concrete surfaces surrounding the site. The project also minimizes energy usage with the use of daylighting throughout the building. It provides natural light into the library, a space traditionally flooded with artificial light, and the community center. The materials in this project are also chosen with sustainability in mind.

Innovation



The exterior cladding, mill-finish stainless steel, uses 40% less energy than standard stainless steel while minimizing glare as it absorbs more light than it reflects. Recycled materials were used within the building from wood wall panels to flooring.

Figure 88 | Maryvale Gym



Figure 89 | Maryvale Plan

In a time that libraries are facing the modern age of e-books and lose of revenue, the incorporation of a library into a community center creates a physical representation of the necessity of both mind and body. The incorporation of two traditionally separate spaces into one not only increased the traffic in both, it also decreased the construction cost by sharing many public spaces such as parking, hallways, and mechanical spaces.

PRECEDENT RESEARCH TAKEAWAY

These case studies were chosen due to their various typologies and shared traits of sustainable site design, success within the community, and the use of passive design. The focus of the precedent studies was to gain a better understanding of the multiple typologies in this project. The three typologies examined through precedent studies are planned communities, community center, and medical facility.

Studying successful planned communities will help with the master planning phase of this project. Understanding how planned communities can form physical and social connections with architecture will help in the design of this project's community center and the incorporation of multiple successful practices. While the popularity of planned communities has increased rapidly with the growth of suburbs, the sense of community has been lost through poor architecture and even worse urban design. All four planned community precedent studies fought the modern suburban community and integrated principles of design that define many European cities and East coast neighborhoods. By studying this communities, I can avoid the mistakes of many

urban designers and integrate design principles that have proven effective through centuries of living. Some of the design principles that I plan to apply to my project is a public nature preserve, use of native landscaping, minimization of vehicular paths, hamlets within the community, community gardens, and a new urbanist organization of the community.

For the design of the community center, studying both a community center and medical facility gave me a deeper understanding of how to successfully design a public space that can both connect people and assist in their various needs. The community center in my project will contain a library, gym, and classrooms like the community center precedent study but unlike most community center, my project will integrate respite care within the community. Studying a community center that integrated multiple programs in it that are not typically included in a community center shows that new uses can be integrated in a way that improves the users experience and increases usage. The medical facility precedent case study will also assist in the design process as it shows how a hospital that used new family focused medical care model to improve user satisfaction and improve patient experience. Being chronically ill is not just a personal experience, it often affects those in their family who can take on more household duties or become care takers, being able to integrate a family focused medical care center within a community would help strengthen relationships not just within the community but also within families.

By analyzing multiple typologies through precedent studies, I have gained a better understanding of how the different aspects of my project work independently as well as together. While I have personal experience with the various typologies within my project, the success of the projects that I have firsthand experience with is less than those that I have analyzed. These precedent studies have not only given me a better idea of what to include within my project but has also helped me create a starting point for the design phase.

PROJECT JUSTIFICATION

Social Justification

I have spent most of my life learning how to live with a chronic illness and how to manage its impacts on my life. Living with a chronic illness is more than just learning to manage the physical symptoms of the illness, there are so many social and emotional impacts that most will never be able to understand. Going to a small school with no one that understood what living with chronic migraines is like, I felt isolated and misunderstood because of my illness. I would spend almost half the month in a dark room alone because any light or sound would make the pain unbearable, I missed school and social events, and became known for my migraines. Almost a decade after I was diagnosed, I discovered an online support group that was full of people that understood what my life was like. Having a community that understood made managing my illness a little easier. That is what the purpose of my project is, to create a community that understands what life is like with a chronic illness and creates an environment that caters to the extra needs that come with a chronic illness. Having a community that can improve the quality of life for an underserved group of people would justify this project. Nursing home, assistant living, and hospice are available for those at the end of their life that need additional assistance. Yet, there is no option for those that still have decades of a full life ahead of them, but they might need support to live that full life. This project could create a community that offers them both physical and emotional support that will help them live a fuller life than if they were to live in a standard American neighborhood. With an increase of those suffering from chronic illnesses increasing due to a longer life expectancy and climate change, the need for this community is higher than ever. The social and cultural impact of this project would be lasting as it would change both the medical care field and the urban design field.

Academic Justification

Creating a sustainable community for the chronically ill presents numerous challenges and opportunities for learning that have not occurred in my education so far. While the requirements for ADA are taught in school, it is not often taught how to improve designs to cater for those with various levels of ability that are not a requirement for ADA. Learning how to cater to those with various medical needs with the programming and organization of spaces will widen my knowledge base on accessibility. My project will also teach me to design in a climate that I have not had any design experience with previously. Learning how to design in an arid climate will increase my technical knowledge while pushing me in my design skills.



Figure 90 | State Trust Land

HISTORICAL CONTEXT

Early History

The Hohokam, meaning the people who have gone, were the first settlers in the area around 550 BC and lived in the area for over 2,000 years. During this time, they constructed a sophisticated system of irrigation canals that were over 135 miles in length. This made the previously inhabitable area support a growing farming population until a suspected drought led to the disappearance of the Hohokam tribe. During their time along the Salt River, the tribe's architecture developed from homes built of bent branches and mud to adobe compounds. Much of the civilization is still present with ruins dotting the natural desert landscape. Some of the original canals have continued to be used throughout the development of the area.

In 1867 the area was rediscovered by Jack Swilling that believed the area had potential for farming. By 1868, Swilling had diverted the Salt River back into the historic canals and began the first farming season in what had become a small colony that after multiple name changes would come to be called Phoenix. The area was still had an agriculture-based economy when Phoenix was incorporated in 1881. It was not until the Southern Pacific Train arrived in 1887 that their economy shifted to a trade market. The city continued to grow through an economic boom in the 1890s which led to the creation of Roosevelt Dam, which managed the water supply from Salt River.



Figure 91 | Hohokam Ruins



Figure 92 | Central Avenue 1948

Recent History

In 1912 President William Howard Taft made Arizona a state with Phoenix as the capital. The city began to grow rapidly with the construction of the Hoover Dam in 1911 which secured the city's water supply for decades to come. The city's growth increased even more drastically during World War II when thousands of military personnel were assigned to a local military training center. Many of these men returned to the area with their families after the war with the invention of AC. The area also began to be a destination for retirees as the mild winters and modern transportation created an annual migration of the elderly to the Southwest.

This migration is what led to the creation of Gold Canyon 40 minutes outside of Phoenix's city center in 1974. Harold Christ chose to develop the area due to its "John Wayne movie" feel and made an effort to preserve its rural environment. Gold Canyon Resort was the first of many developments to be built which was quickly followed by multiple golf course communities and 55+ communities. However, the area's growth will be limited in the future as it borders State Trust land that preserves Tonto National Forest.

Sustainability History

Gold Canyon is unincorporated and therefore has no sustainability initiatives or additional building codes. However, its mother city Phoenix has a long history of being called "the least sustainable city in the world" which has led to recent attempts to rid itself of its nickname. It is currently ranked 43rd in the U.S. cities sustainable development goals index with failing scores in no poverty, zero hunger, climate action, and peace, justice, and strong institutions. Due to the city's lack of sustainable initiatives, average summer temperatures are expected to rise 3-5 degrees by 2050. Which as a city that only received 7.5 inches of rain a year, an increase in temperature can drastically reduce the area's water supply. Climate change has become an increasing concern for the city which led to the creation of the Arizona Sustainability Alliance and its sustainability goals. The city adopted the Alliance's 2050 Goals to improve the quality and sustainability of life in the city including goals.

Sustainability Goals

- 90% of the population living within ½ miles of transit with 40% of the population using transit
- All new buildings will be net-positive
- 15 compact complete centers will be created to provide all services needed by the community
- Reduce urban heat-island through green-infrastructure and by adding 150 miles of paths

Planned Community History

Gold Canyon began as a town intended for planned communities, so it is greatly influenced by the history of planned or “master planned” communities. Planned communities became popular in 1869 after the creation of Riverside which boasted curved streets and ample greenery. After its completion, planned communities began to be constructed across the United States. They are defined by the extensive planning that goes into each aspect of the area before any single aspect is built. The Planned Community Archives at George Mason University defines planned communities as large-scale, mixed-use developments that follow a single master plan. Americans came to prefer these communities as they offered less traffic, community amenities, green space, and a stronger sense of community. As the idea of a planned community became more developed, some developers chose to create “special interest” communities that offered a lifestyle that reflected one specific interest like active living or boating. Other communities focus on a specific age group such as retirees. The Villages in Florida is one of the most famous planned retirement communities as it offered many amenities that enticed retirees.



Figure 93 | The Villages

SOCIAL CONTEXT

Definition of Chronic Illness

“Chronic diseases are defined broadly as conditions that last 1 year or more and require ongoing medical attention or limit activities of daily living or both. Chronic diseases such as heart disease, cancer, and diabetes are the leading causes of death and disability in the United States.”

– CDC

Chronic Illness Examples

- Alzheimer's Disease
- Autoimmune Diseases
- Cancer
- Coronary Heart Disease
- Diabetes
- Epilepsy
- HIV/AIDS
- Hypothyroidism
- Multiple sclerosis
- Parkinson's Disease
- Stroke
- Chronic Migraine
- Asthma
- Osteoporosis
- Chronic Kidney Disease
- Depression

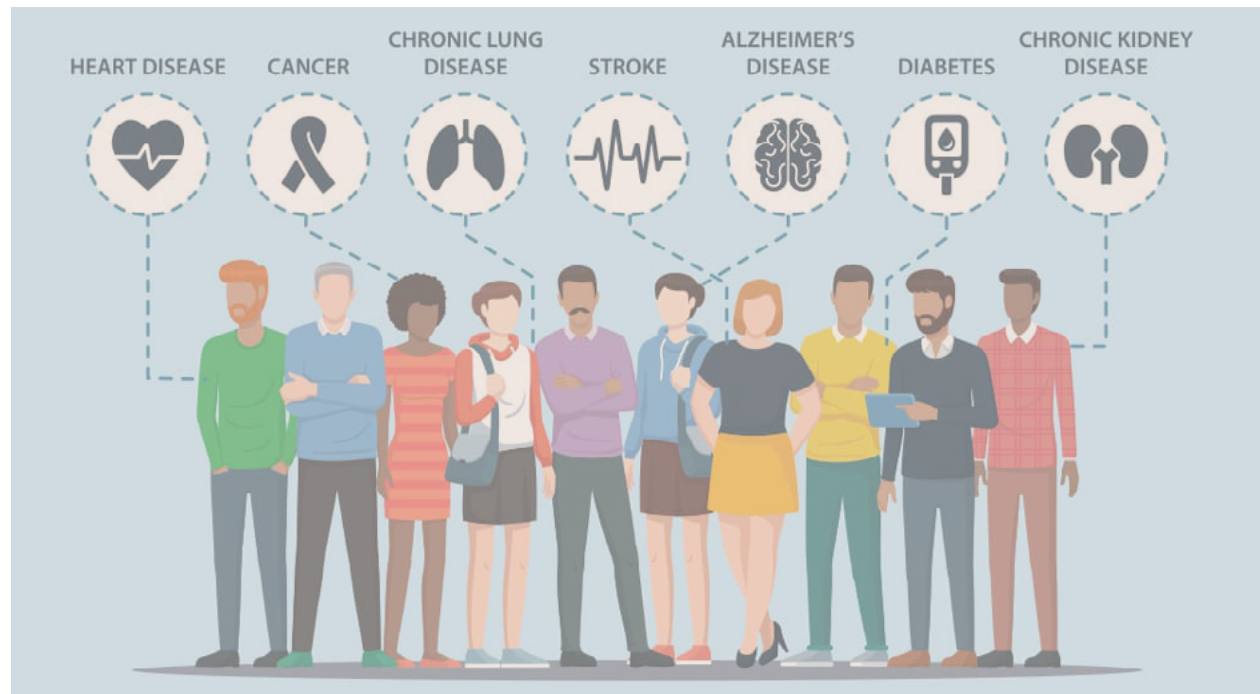


Figure 94 | Chronic Diseases

Chronic illness is something that has been hard to classify and was not defined by the medical field until the 20th century. Many do not recognize the impact that chronic illness can have unless they themselves have been diagnosed with one. Diseases that are chronic have a variety of symptoms with many being “invisible” such as anxiety and pain. When others can not see your illness there is often a lack of sympathy from others which can cause additional stress and loss of relationships. While having a physical manifestation of a disease can change how others treat you, both negatively and positively, there is a social acknowledgment of the illness. “Invisible” chronic illnesses that do not manifest physically do not receive this response. Those without a physical manifestation may be viewed as healthy and be treated as so. While this can have some positive aspects, there are many negative aspects as these are the illnesses that often receive the least aid. Some may face regular invalidation of their illness as others will deny that a person deserves assistance as they do not appear ill. This can lead to loss of jobs and relationships as some chronic illnesses can impact one’s ability to work.

Demands of Chronic Illness

- General understanding of the illness
- Research and comprehend the treatment and therapy
- Create a trusting relationship with medical team
- Locating more specialized care if primary care fails to manage symptoms
- Learn symptom management
- Maintain personal relationships through medical uncertainty or symptom flair up
- Avoid emotional and mental isolation
- Increased stress due to constant uncertainty

SITE ANALYSIS

The site for this project is located outside Gold Canyon, Arizona city limits on Bureau of Land Management property at the base of Superstition Mountain. The land is currently undeveloped but is adjacent to multiple new gated residential developments such as Perlata Canyon Homes. These developments consist of multiple home designs that create an endless maze of poorly designed, energy intensive homes that offer residents no visual satisfaction. The homes are developed organically but do not take environmental factors in the orientation of buildings. Another development to the Northwest is older and consists of larger lots with native desert plants and unique home designs. This 55+ development runs along a golf course and its many identical homes. There are numerous 55+ communities in the area that offer many amenities to their residents and have private restaurants that are not open to the public. Within 5 miles of the site, there is access to many of the needs that residents of the project may need such as a grocery store, a family medical center, multiple specialists, therapy clinic, urgent care, and an elementary school. While the site is in an undeveloped area there is access to most everyday need within a short drive. The commercial offerings in the area are aimed towards an older population with an abundance of medical services and early morning breakfast restaurants while lacking nightlife and child-aged services. This may present to be an issue for designing a community that serves all age groups as services for children and young adults may need to be included on site. There are plans for development between Gold Canyon and Mesa Gateway Airport which would create more direct to a more diverse offering of services.



Figure 95 | Site Region

Service Proximity



Site Boundary

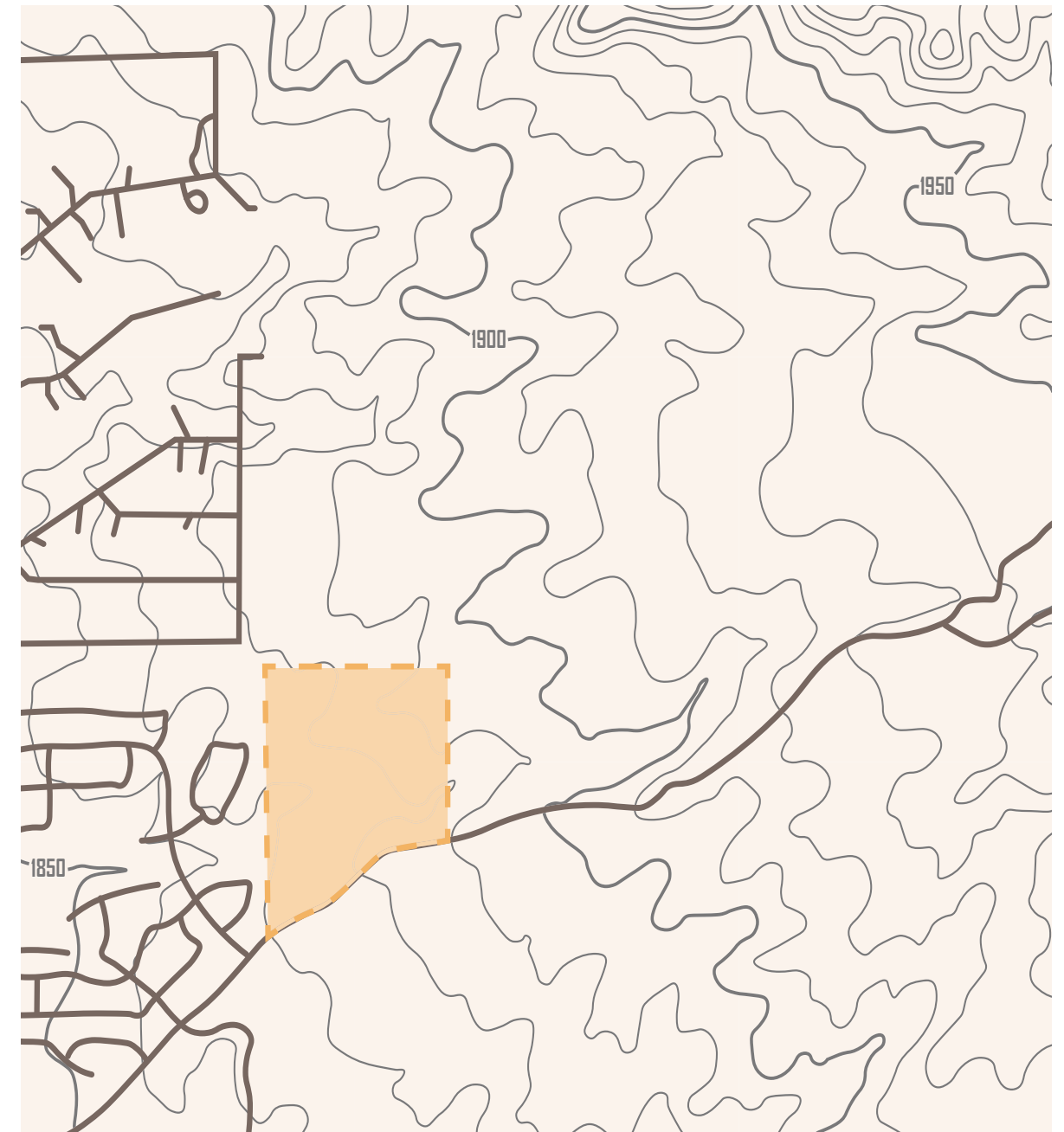


Figure 96 | Site Boundary



Figure 97 | Views

Views

As this site is located adjacent to a development, views to the West are primarily the back of homes or fences that prevent wildlife from disturbing homeowners. To the North, East, and South are views of the natural landscape of the Sonoran Desert. Superstition Mountains loom to the Northeast and provide a sense of protection as well as spectacular views.

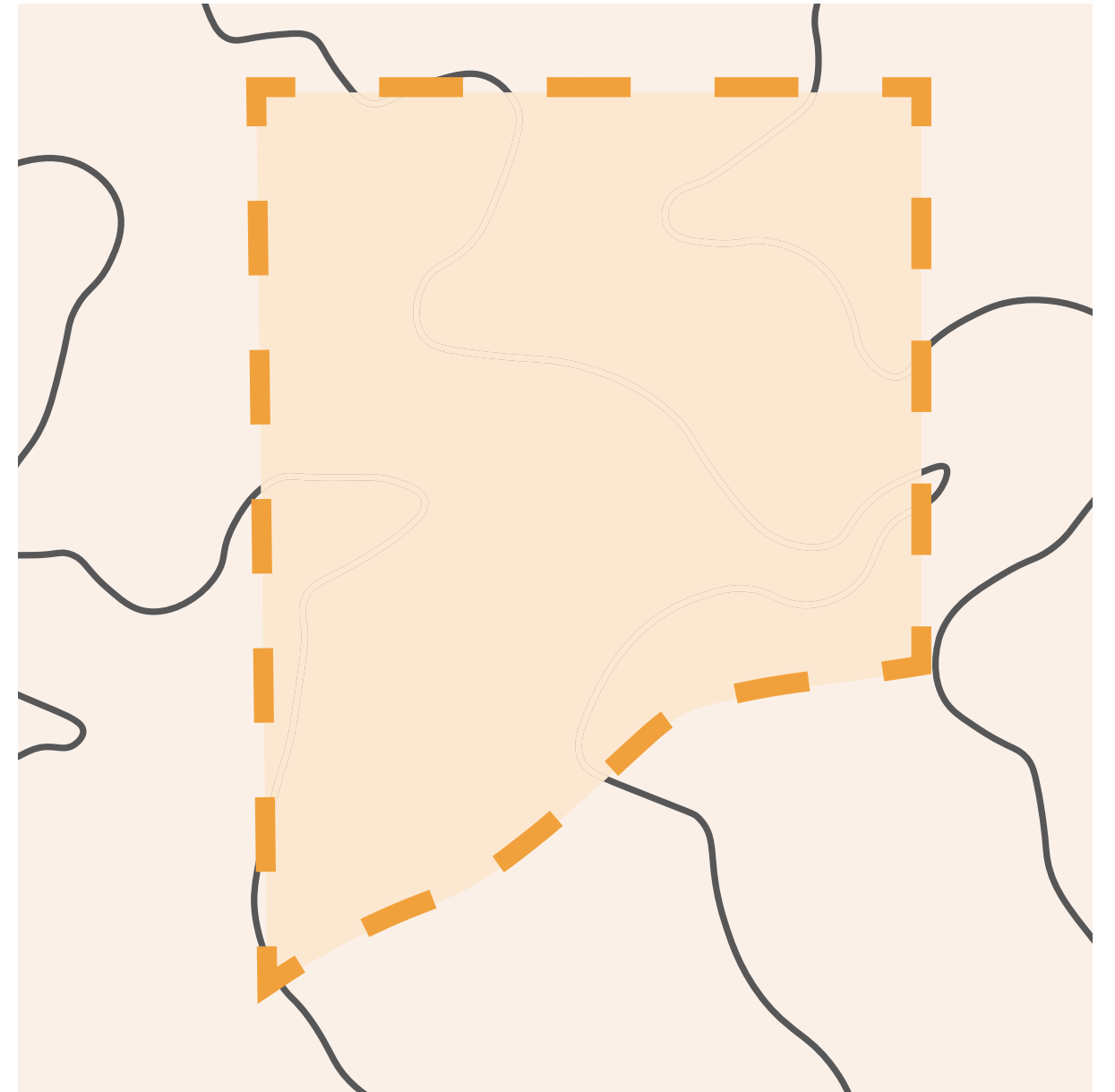


Figure 98 | Site Typography

Typography

The site is located within Salt River Valley at the base of Superstition Mountain on a relatively flat piece of land. There is a gentle slope across the site that is bisected by a wash that can fill with water after a rainstorm. Over the site there is an increase of 30 ft from the West to the East and 20 ft from South to North.



Figure 99 | Site Character



Figure 100 | Site Character

Character

The site has an untouched, harsh character that is shown through its uncontrolled landscaping and extreme heat. Yet there is a beauty to the natural landscape that can only be found out in nature away from the city. The only noises to be heard are plants rustling in the wind and an occasional desert rat scurrying along the ground. Occasionally, a car or ATV can be heard traveling along the road that runs along the south of the site. There is a sense of peace to the quietness of the site that encourages a healing environment.

Wind

Due to its location in the Salt River Valley, the site rarely has strong winds. During the spring wind comes primarily from the Southwest and West which create low pressure trough which moves cloudy and rainy conditions across the area. The summer is defined by Southeast and Northeast winds that are gusty and tend to blow dust or create dust storms.

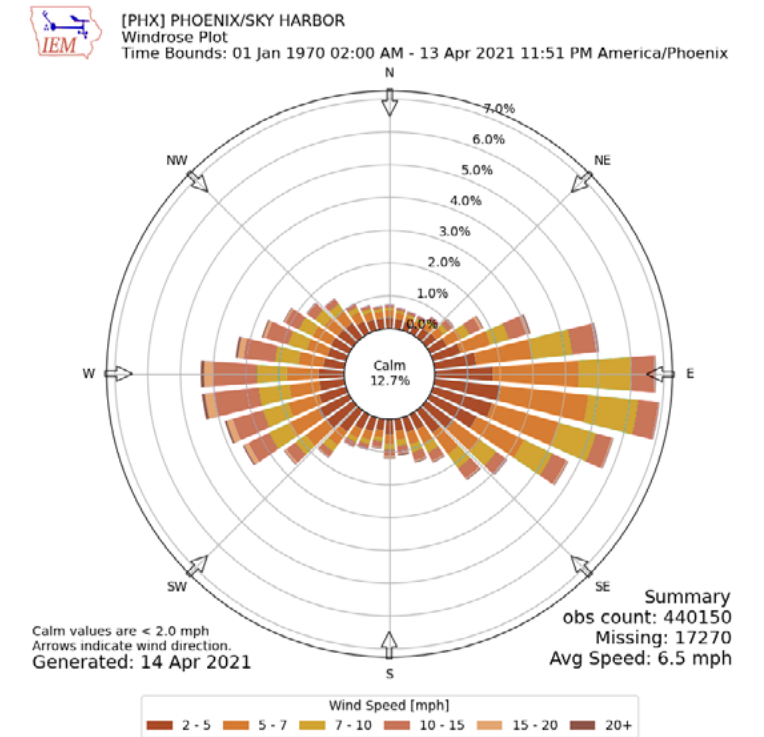


Figure 101 | Wind Rose

Sun

Located on the southern part of the United States, the site receives a large quantity of sun throughout the year. During summer months, the sun angle casts sunshine on the northern façade up to 6 hours a day.

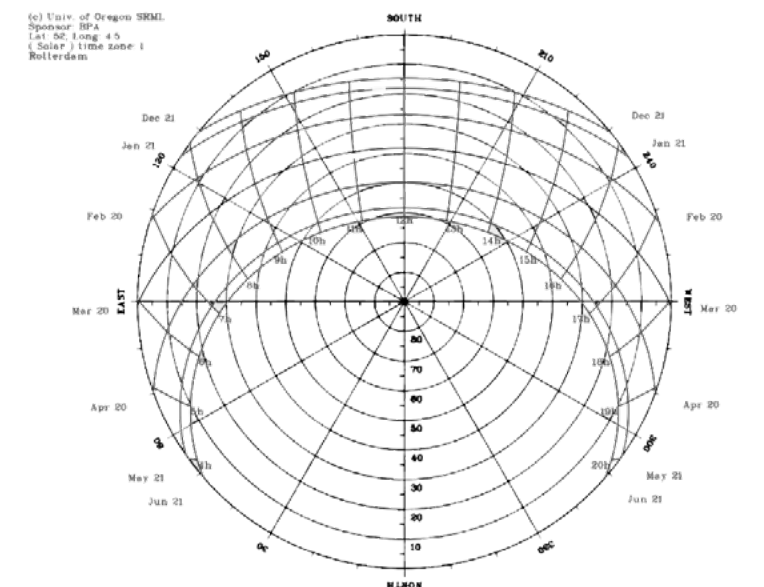


Figure 102 | Sun Chart

Zoning

The site is currently not zoned but surrounding developments are zoned as a mixture of single residence and multiple residence. As the city of Gold Canyon is still young and it has yet to fully define all the land use within the city. The city was originally started as a suburb of Phoenix that was to serve to the growing number of “snowbirds” that spend winters in Arizona’s warmth which lead to most of the city being zoned as some form of residential or rural village. As this site is not yet zoned, this project will be completed with the assumption that it will be zoned as a multiple use which includes both commercial and residential uses as the site exceeds the size limitations to be qualified as a village center.

Soils

The soils in the area are heavy in clay, which is very alkaline, which is the cause of the ample yellow foliage in Arizona. Clay is able to absorb large quantities of water which means during the rainy season, the clay can quickly absorb the rapid rainfall that occurs. However, during the dry season the clay soil dries out and can collapse. Below the clay soil is a subsoil called caliche. Caliche is extremely hard and does not penetrate easily. Soil particles are cemented together with calcium carbonate that creates a soil type more similar to concrete slabs than dirt. It is impossible to dig through caliche by hand and requires tools such as a jackhammer to get through. Due to the cost and time it takes to break through caliche, it is most cost efficient to build out instead of up.

Seismic Conditions

Central Arizona has a low to moderate risk for seismic activity with the last significant earthquake occurring in 1887. Only two earthquakes have been recorded with magnitude 6 or higher since the early 20th century. Many of the smaller earthquakes in the area that only resulted in light shaking are the result of a larger earthquake originating in the Southwest corner of the state or in California.

PERFORMANCE CRITERIA

Energy Consumption

As a community focused on sustainability in a climate that requires large quantities of energy to cool spaces, energy consumption is a major concern in this design. As it would take considerable time to calculate the overall energy consumption of the entire site, measurements for energy consumption will only be completed on the community center. A basic energy model will be completed with Insight to maximize energy savings through GWR and wall type. The goal for is to meet the Architecture 2030 Energy Challenge energy usage goals.

Environmental Performance

Located in an area that is rapidly becoming developed and losing its natural habitat, preservation of natural habitat and its wildlife is vital. To preserve the landscape, the site must preserve 25% of the site’s area as a nature preserve. Consideration of materials on the site must also be done to prevent from toxic materials from negatively effecting both wildlife and landscape. This will require research into material composition.

Behavioral Performance

Behavioral performance is directly related to the organization and planning of the community. The placement of buildings and public spaces can have a direct impact on the experience and culture that is created within the community. This will be determined primarily by special allocation and further research into the organization of planned communities.

Psychological Impact

This project is the response to the psychological distress and isolation that often comes from having a chronic illness. Creating a community for the chronically ill will help alleviate some of the isolation while offering assistance to care givers. Stories and firsthand experiences will be incorporated into the design to improve the quality of life for residents. The effectiveness of this considered and determined by the feedback of faculty, friends, and classmates.

Environmental Impact

In an attempt to combat the rapidly growing urban sprawl outside of Phoenix, this project aims to reduce the negative environmental impact that a planned community has. Measuring the environmental impact of a project can be difficult to do and could cover many criteria. As this project can not have any post-occupancy evaluations completed, the environmental impact will be based on the ratio of hardscape to natural landscape. In an attempt to avoid the sprawling neighborhoods with expansive asphalt roads that lead to a heat island, this project will aim to have less than 50% of the developed site be hardscape.

Cost

Planned communities have a high return on investment and are often the first to bounce back after an economic crisis. With that in mind, this project will be designed to be the beginning of community that can grow as it grows to full occupancy so as continue to turn a profit. Homes will be designed to be affordable to all incomes, with various housing types to cater to all incomes. However, there is no overall budget as this is a theoretical project with the possibility of being built in multiple phases.

Space Allocation Space

Due to the two-phase nature of this project there are different space requirements for the master plan and the community center. For the master plan the site will be divided into three categories: housing, shared facilities, and nature preserve. Shared facilities and the nature preserve will each have 25% of the site while housing will cover the other 50% of the site. This division of the site was the result of precedent studies and the desire to preserve a portion of the site as undeveloped desert.

| | | |
|-----------------|-----|------------|
| Nature Hub | 25% | 12.5 Acres |
| Residential Hub | 25% | 12.5 Acres |
| Athletic Hub | 10% | 5 Acres |
| Community Hub | 15% | 7.5 Acres |
| Medical Hub | 10% | 5 Acres |
| Business Hub | 5% | 2.5 Acres |
| Respite Care | 10% | 5 Acres |

Figure 103 | Space Allocation Table

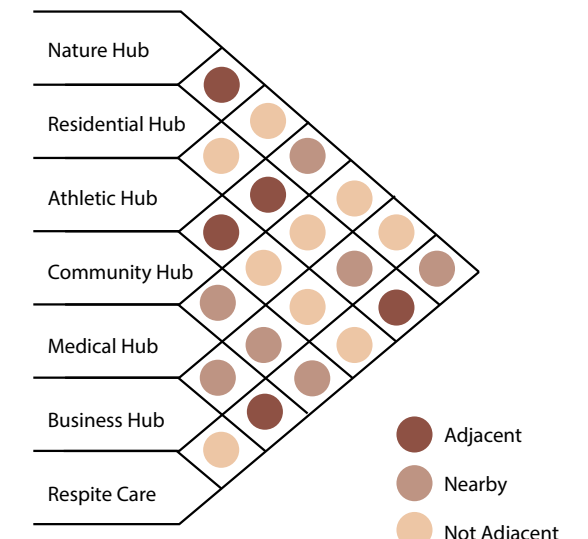


Figure 104 | Space Interaction Matrix

Master Plan Interaction Net

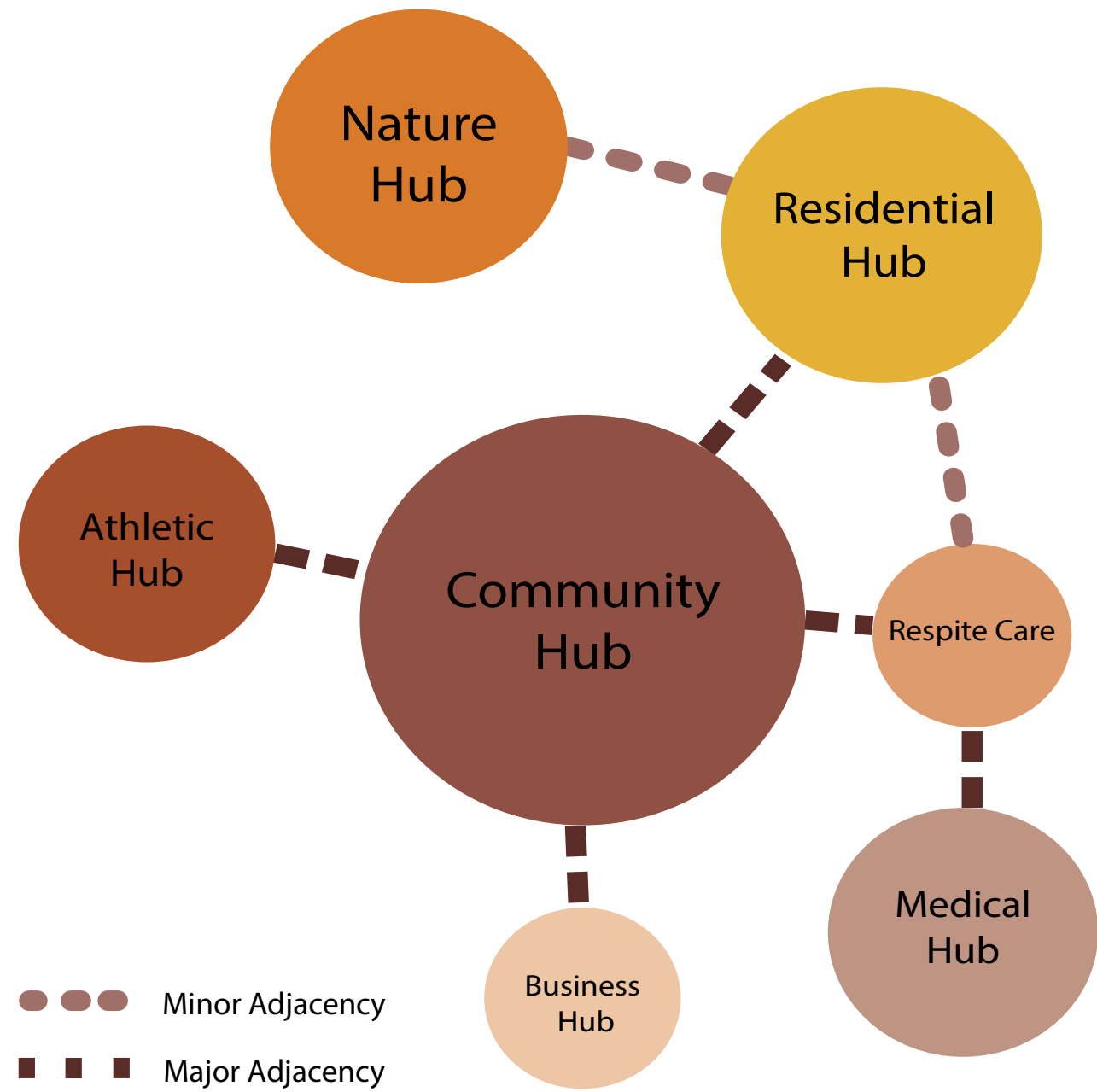
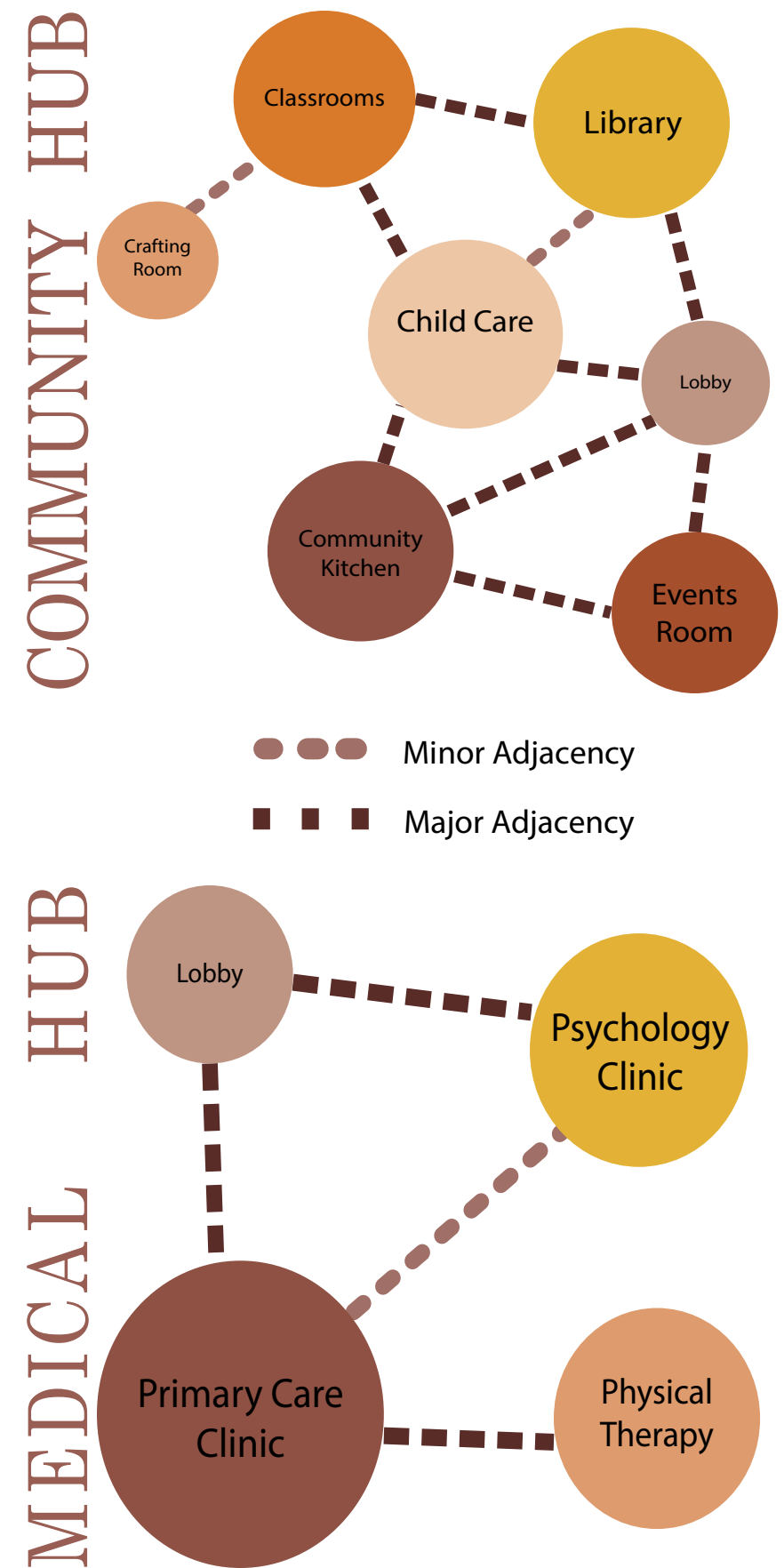
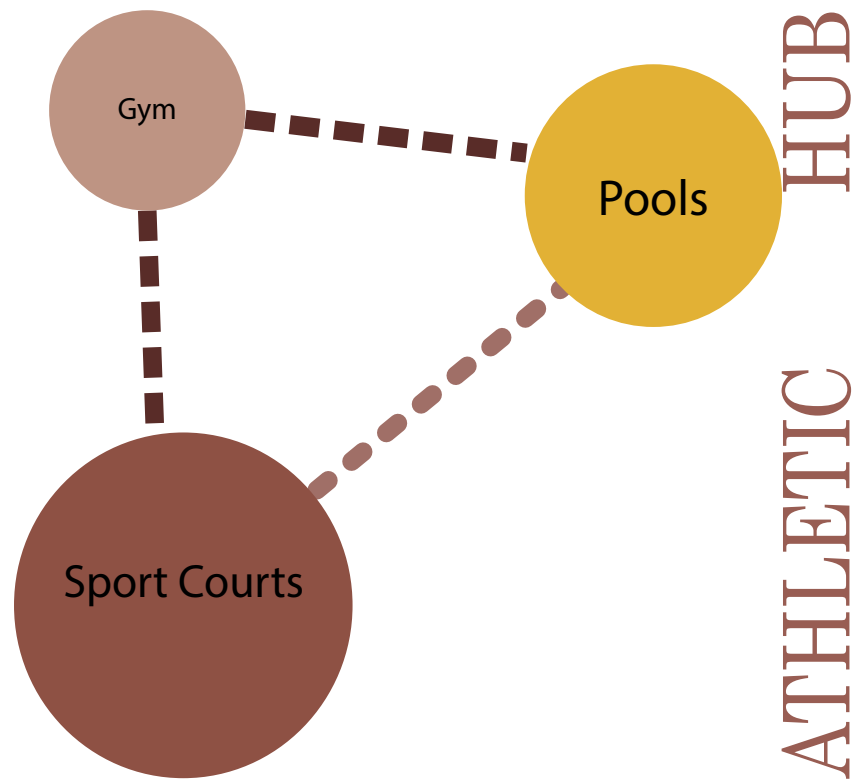


Figure 105 | Space Allocation Tables

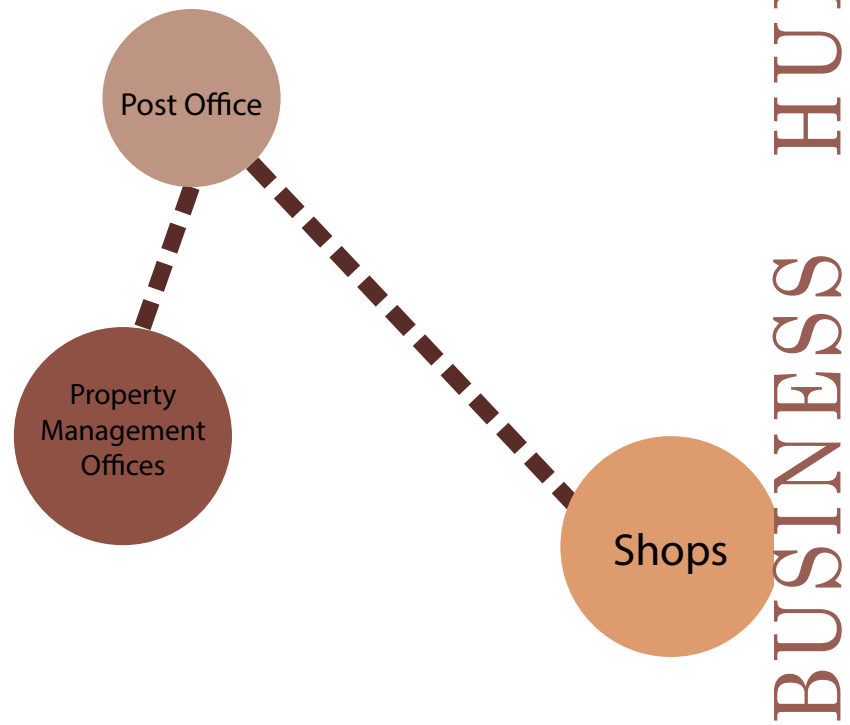
Due to the multi-phase nature of this project, the space allocation is organized into hubs that each focus on a different aspect of the community. Each of those hubs are then analyzed in an individual interaction net that breaks down the various spaces within that hub.



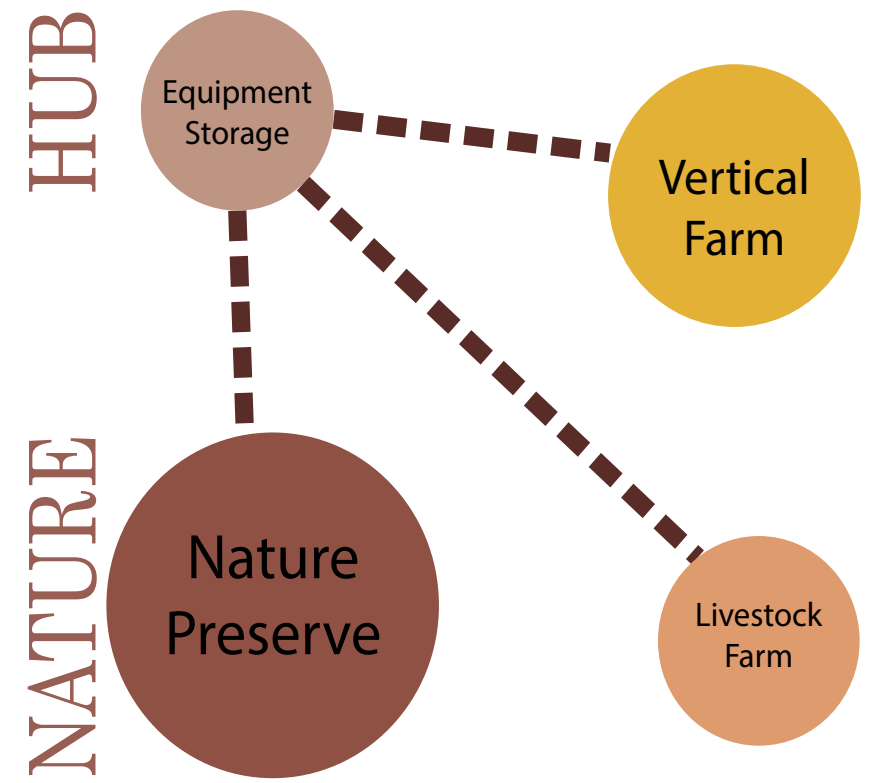


ATHLETIC HUB

- ● ● Minor Adjacency
- ■ ■ Major Adjacency

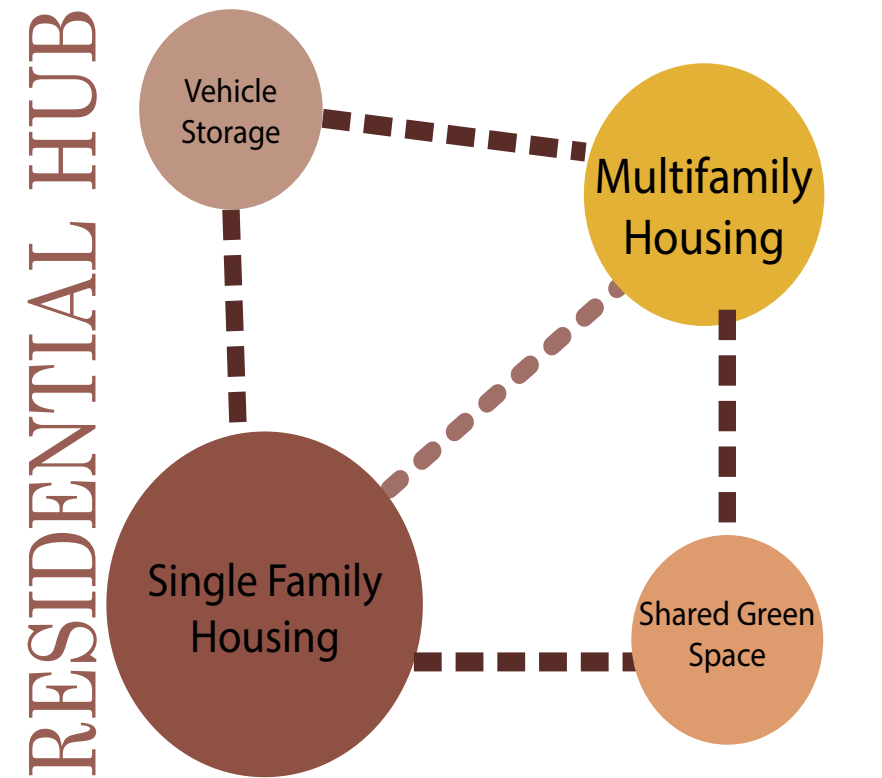


BUSINESS HUB



NATURE HUB

- ● ● Minor Adjacency
- ■ ■ Major Adjacency



RESIDENTIAL HUB

Performance Criteria Summary

For this project the performance criteria will focus on these three factors in order to maintain an inclusive, environmentally conscious, and connected community:

- Sustainability & Energy Use
- Inclusivity & Diversity
- Social, Cultural & Historical

To properly solve the problem that I have addressed, my finished project must adhere to the performance criteria addressed above as well as be guided by the research done through both qualitative and quantitative. This community's purpose is to create an inclusive environment for those that have been excluded through modern design and the demands of a modern life. This inclusiveness should not come at the cost of the environment but should set an example that a community can be sustainable in all senses of the word. The project shall use historical, cultural, and historical precedents to establish a community that reflects the rich history of Arizona. This project will have succeeded if it can attain all of these things.



DESIGN SOLUTION

PROCESS DOCUMENTATION

Master Plan

This phase included a lot of space diagramming and sketches that show a progression of how the site organization changed through the project.

Respite Care

Designing the respite care starting with sketches of exterior ideas and initial floor plans. These sketches were used to create preliminary forms to use for the first phase of energy modeling. With the results of the initial energy modeling, the form changed to improve energy efficiency.

Master Plan

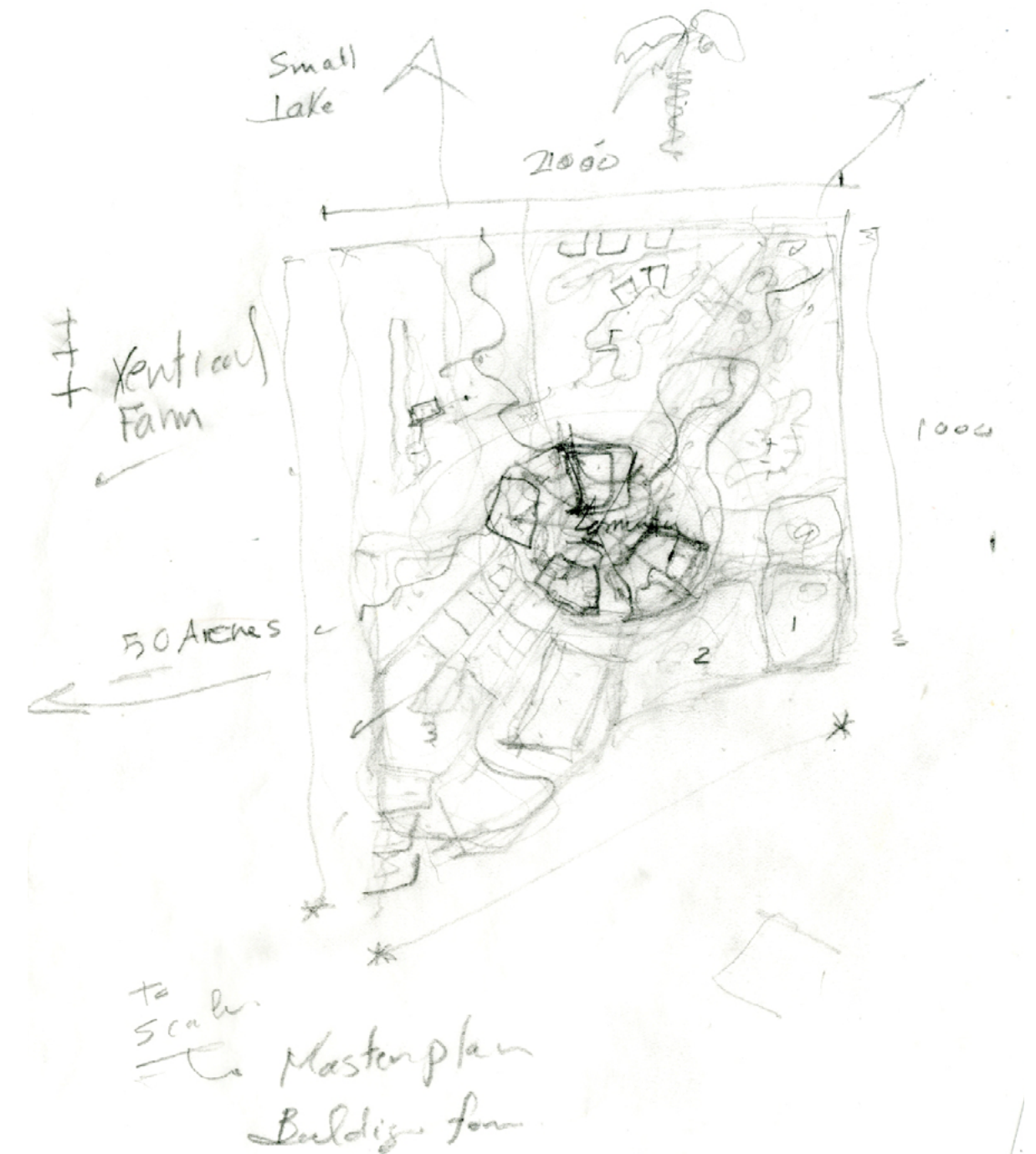


Figure 106 | Process Sketch

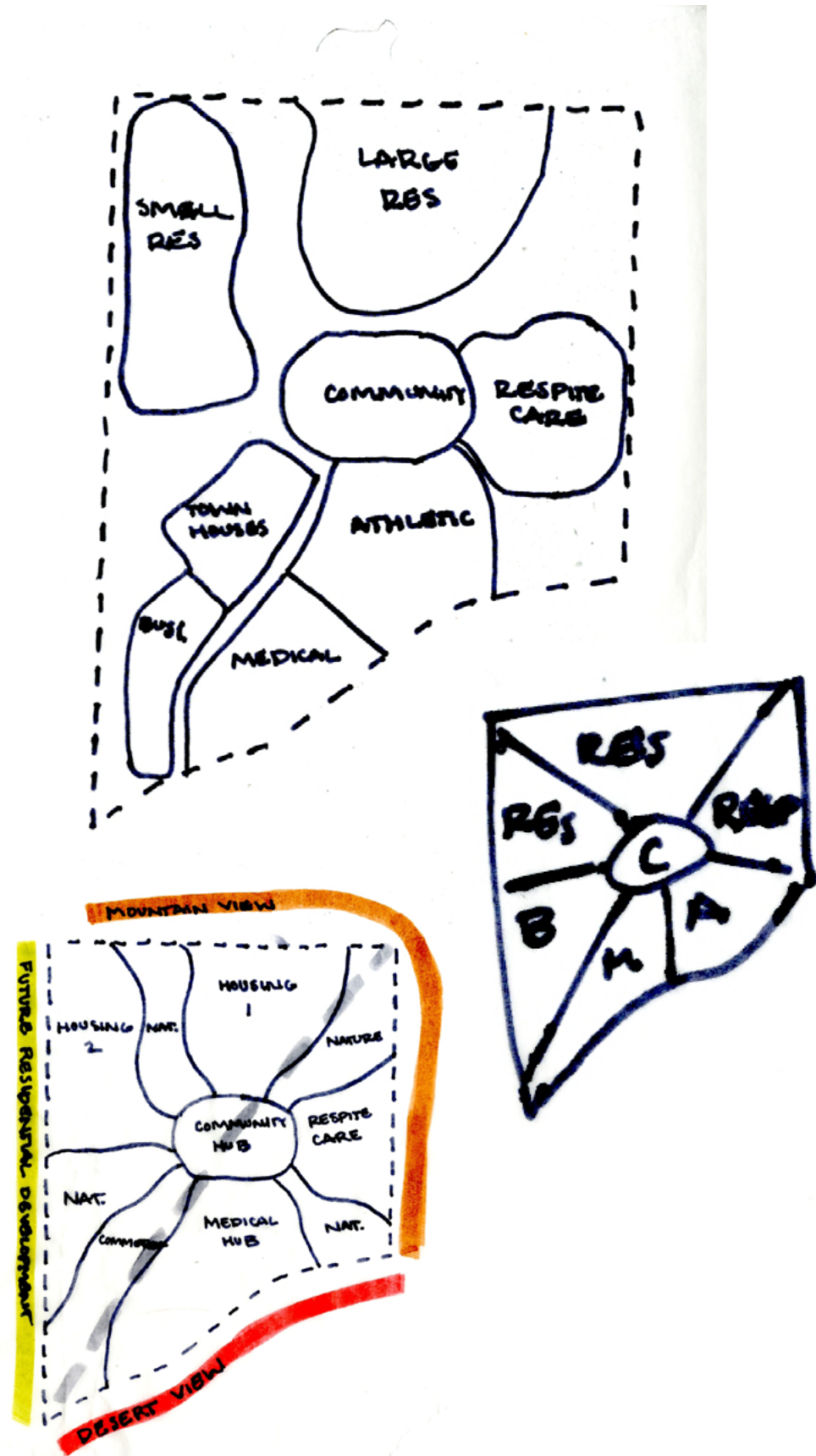


Figure 107 | Process Sketch

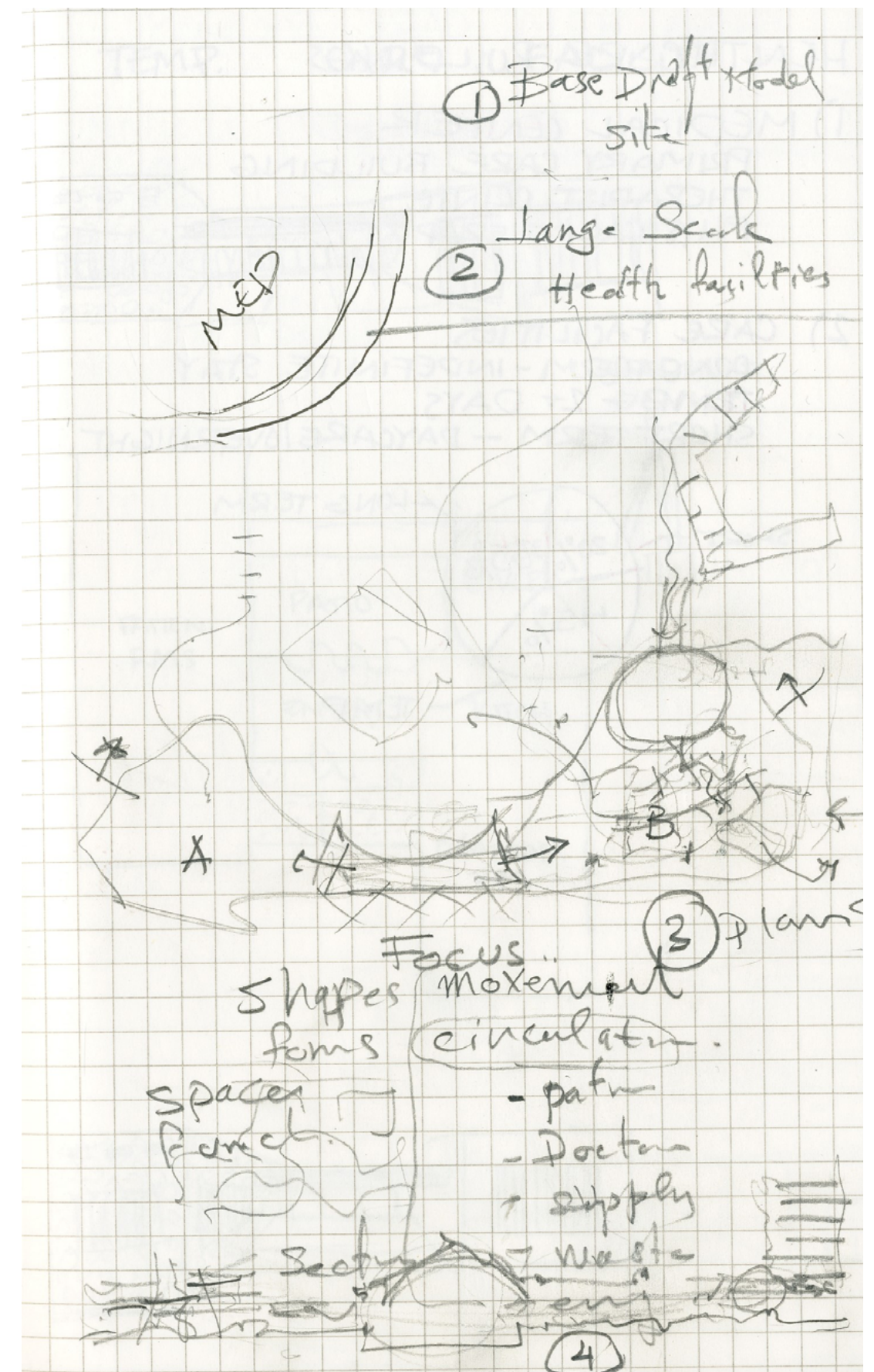


Figure 108 | Process Sketch

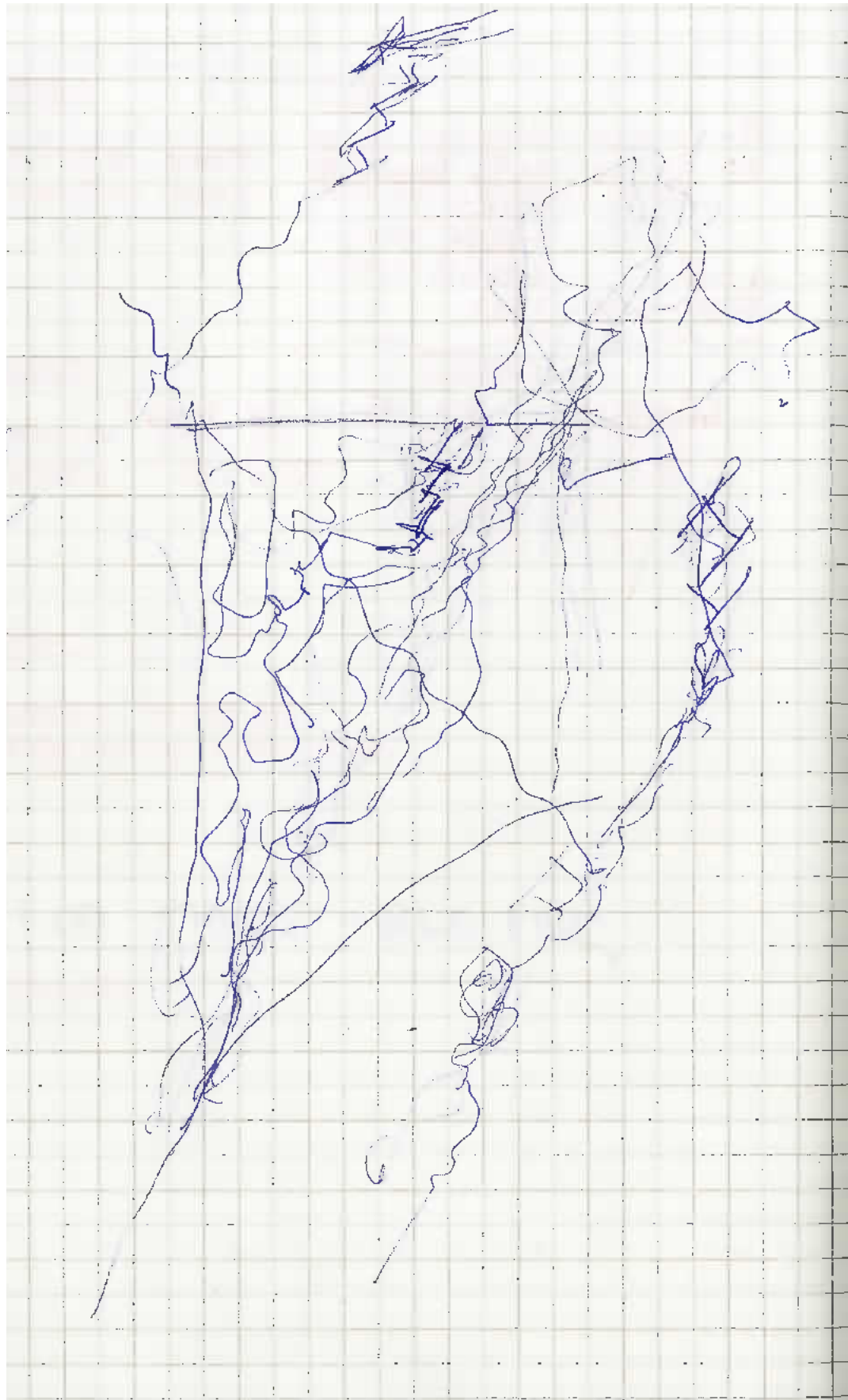


Figure 109 | Process Sketch
162 | Design Solution

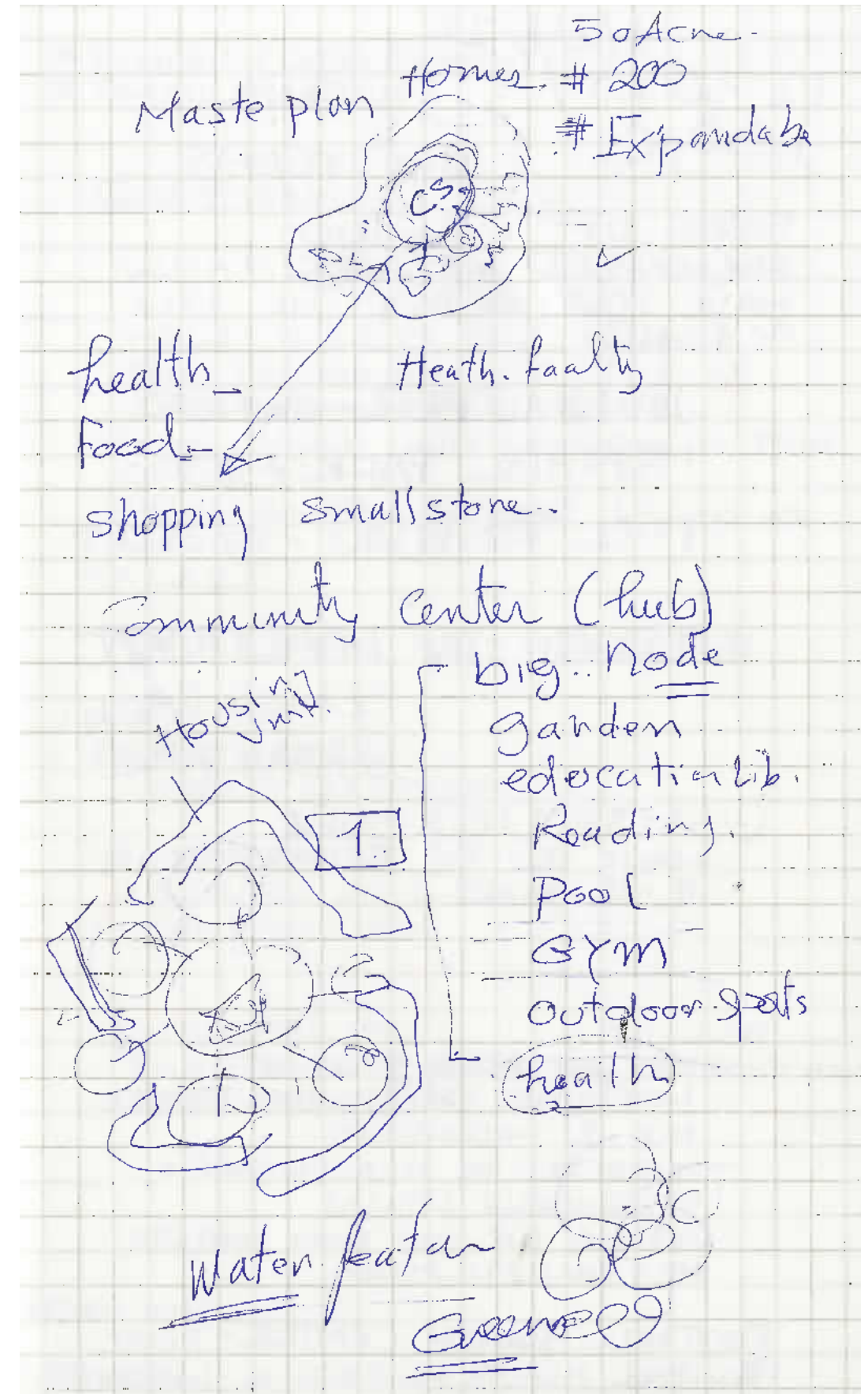


Figure 110 | Process Sketch

Respite Care

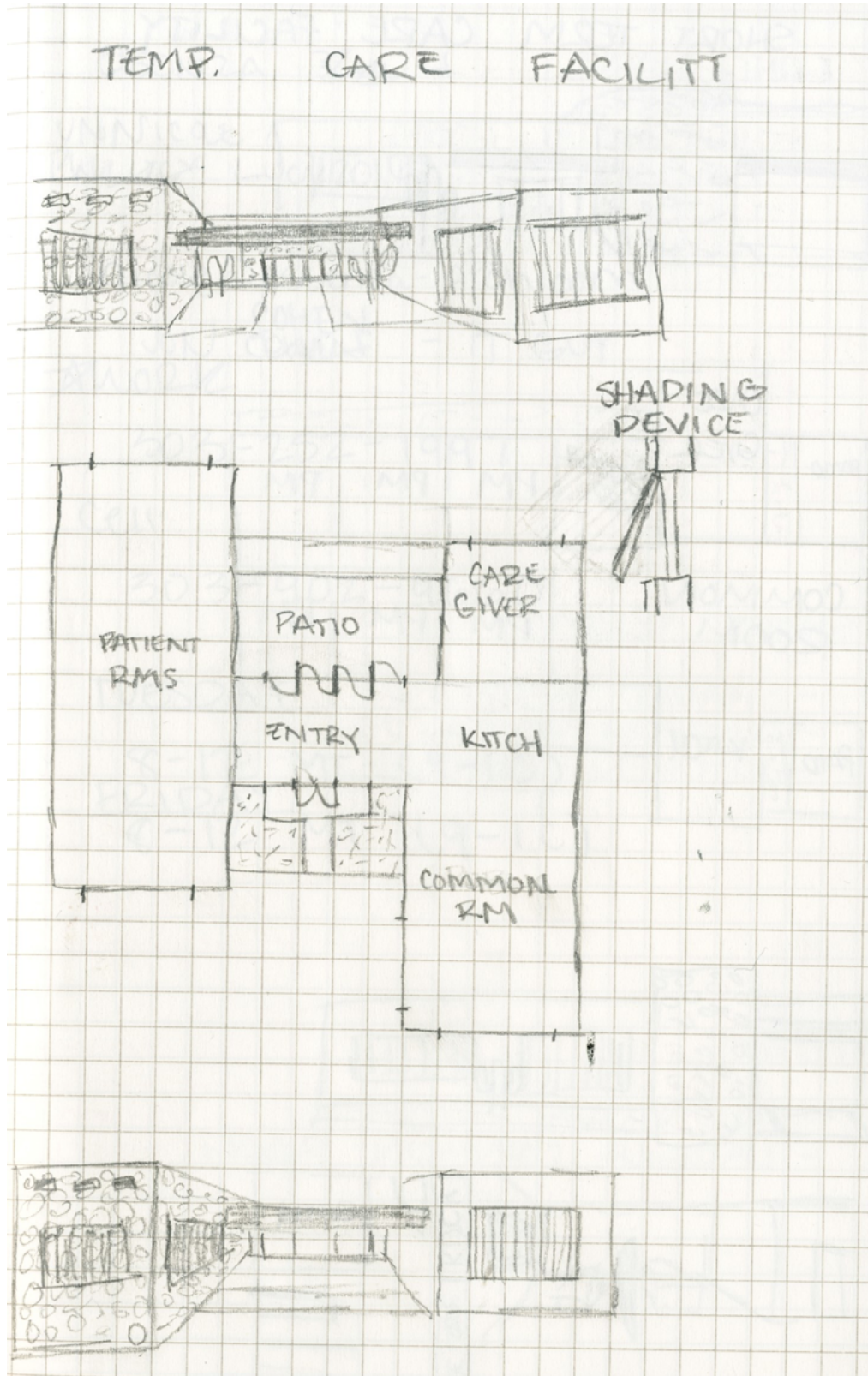


Figure 111 | Process Sketch

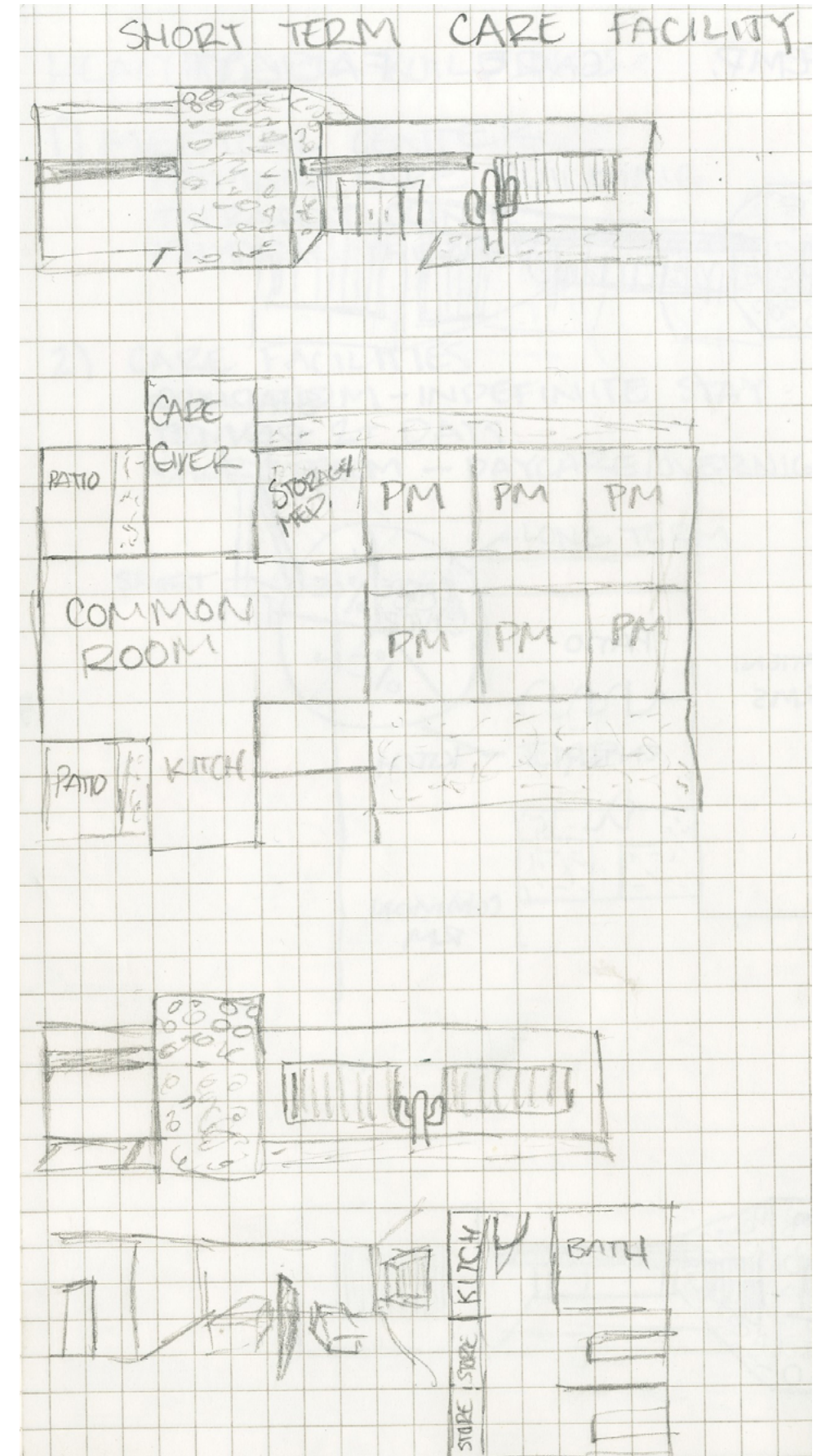


Figure 112 | Process Sketch

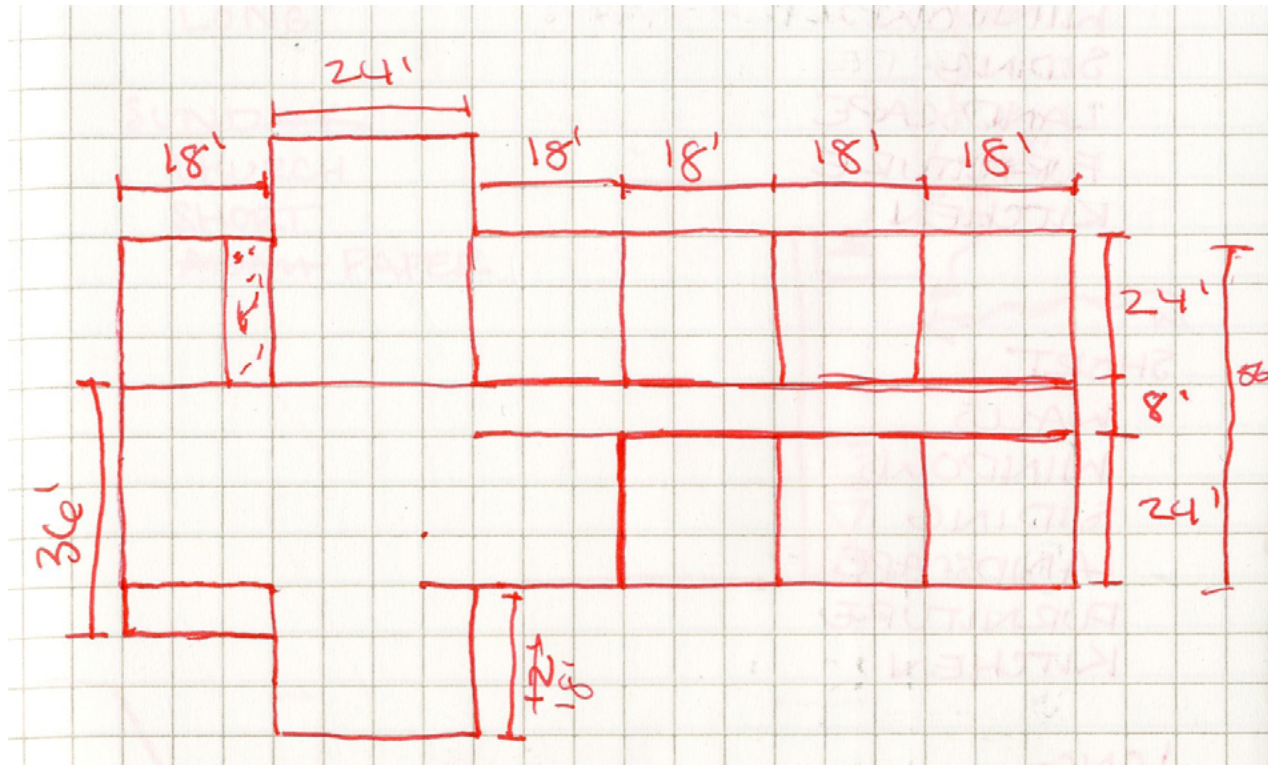


Figure 113 | Process Sketch

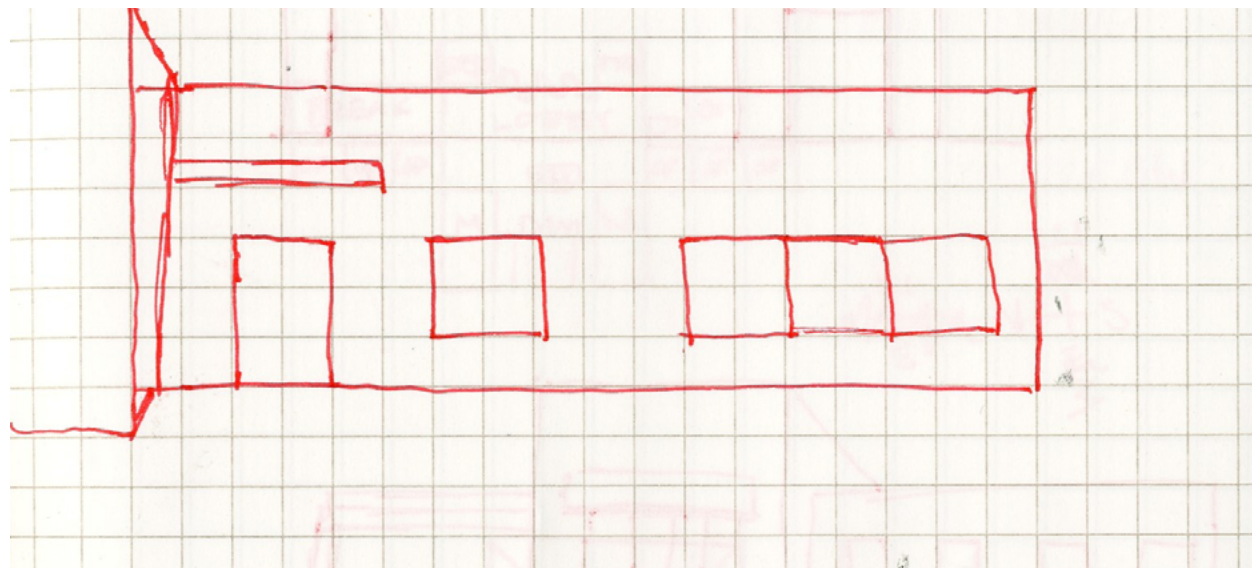


Figure 114 | Process Sketch

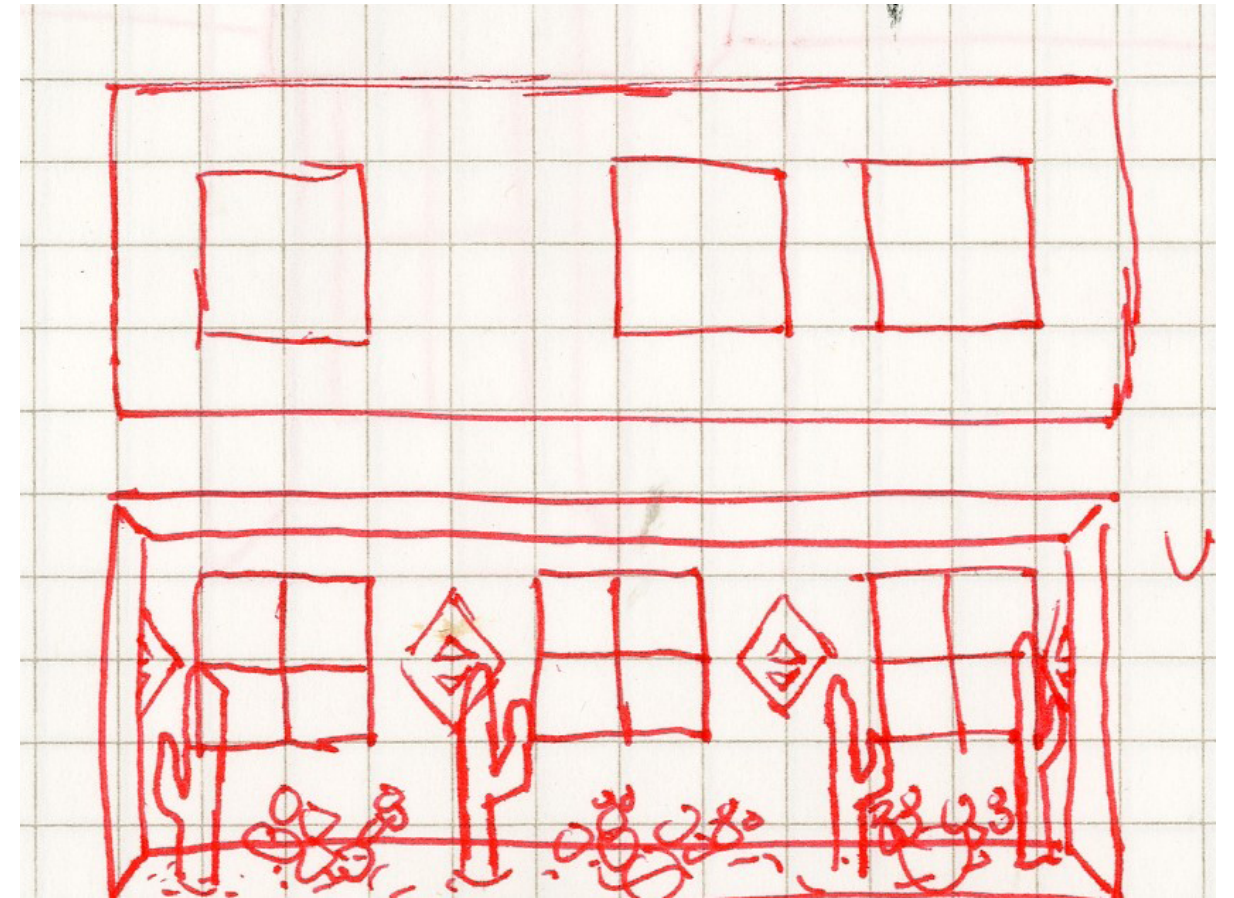


Figure 115 | Process Sketch

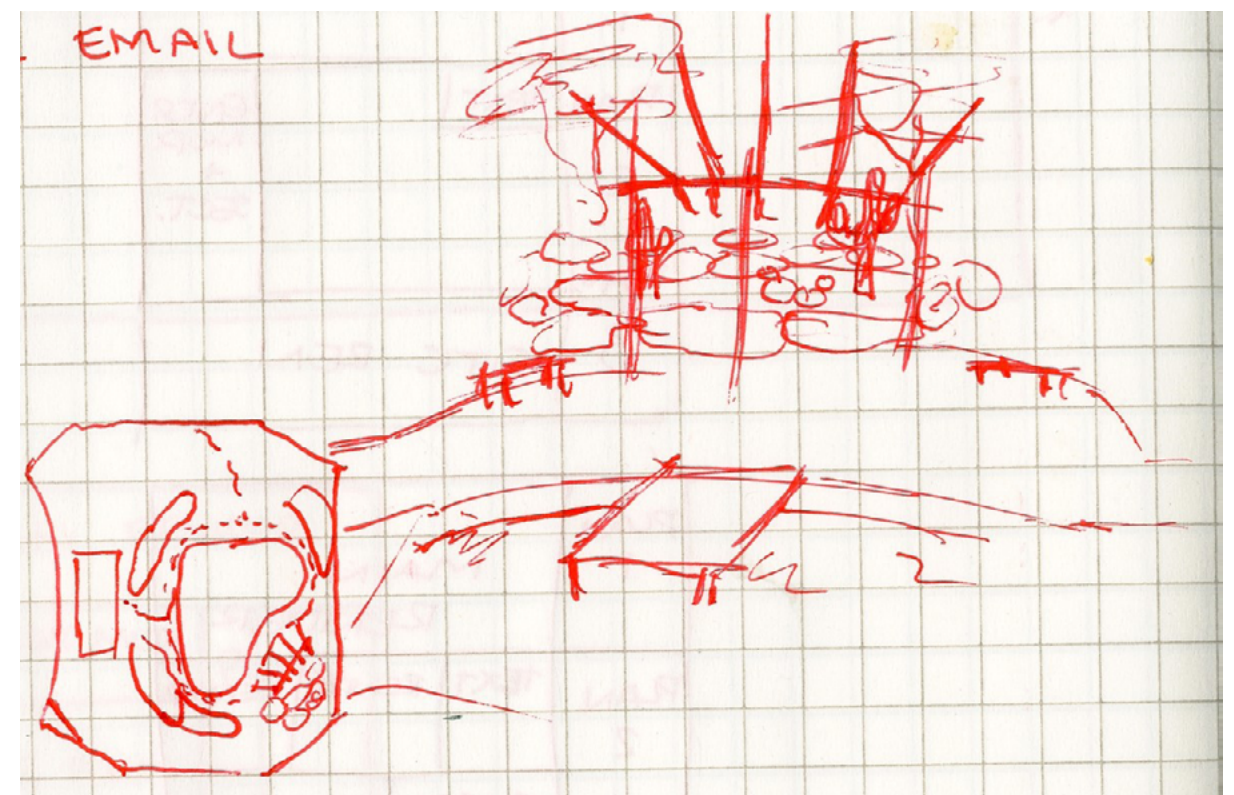


Figure 116 | Process Sketch

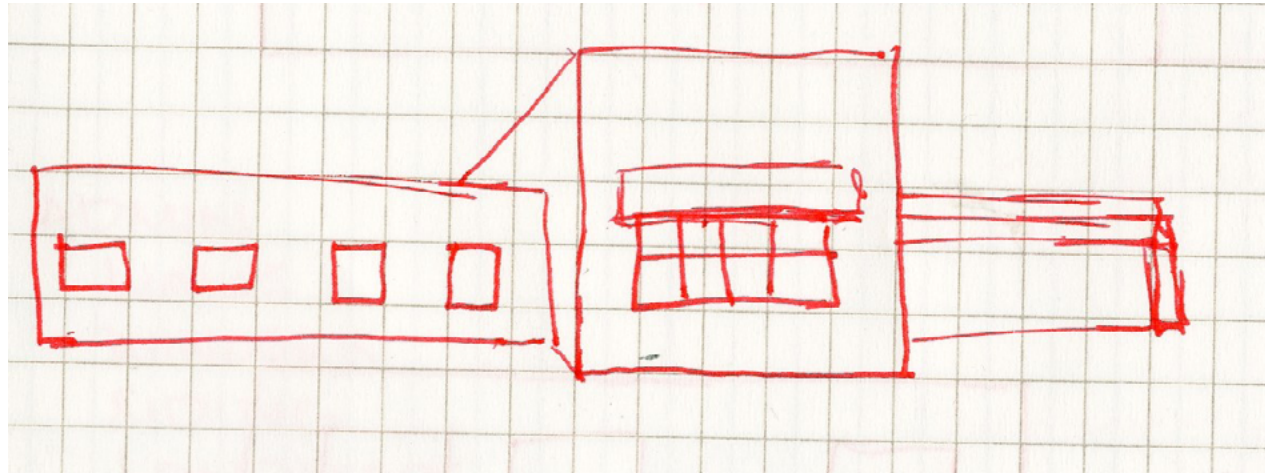


Figure 117 | Process Sketch

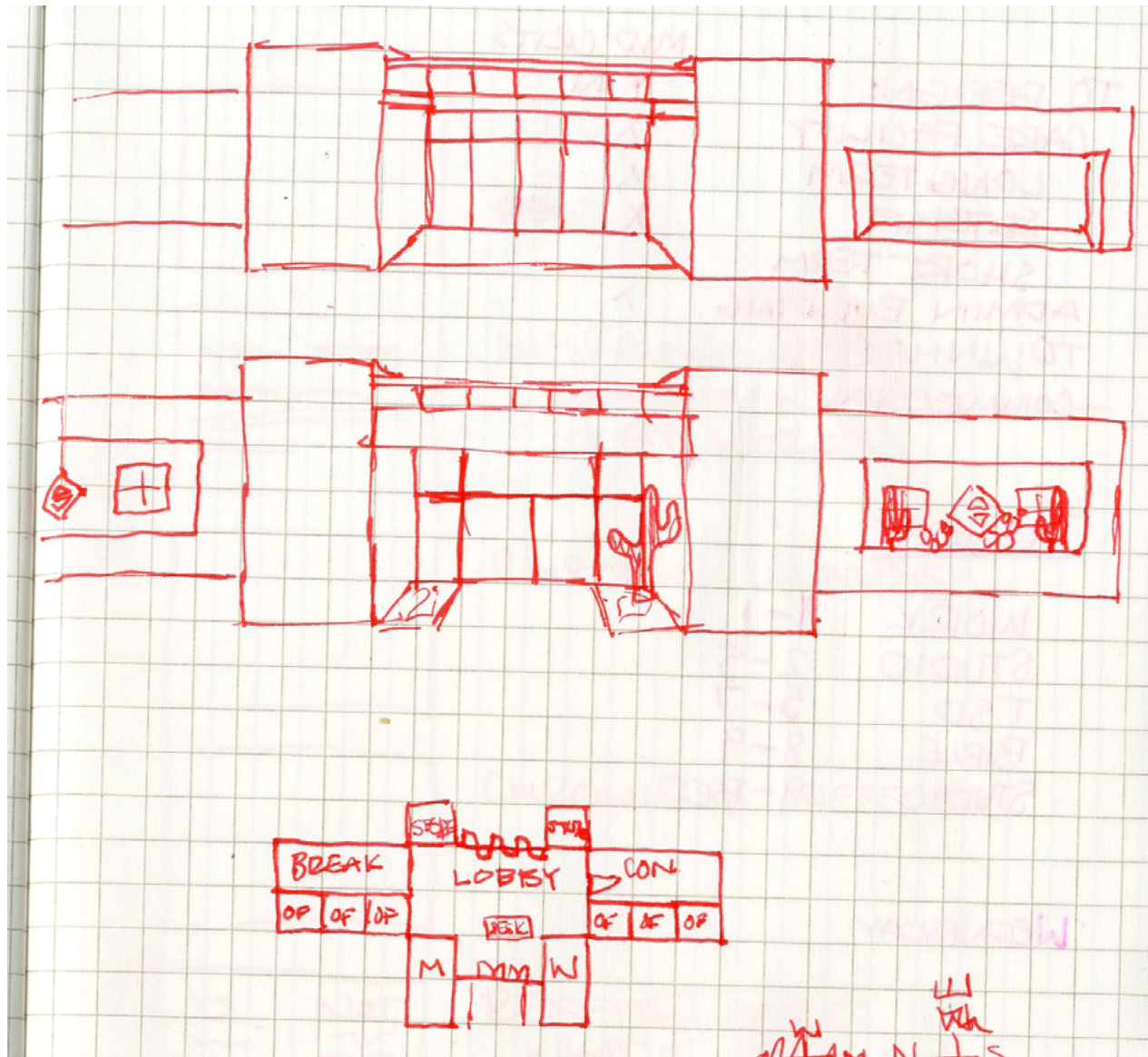


Figure 118 | Process Sketch

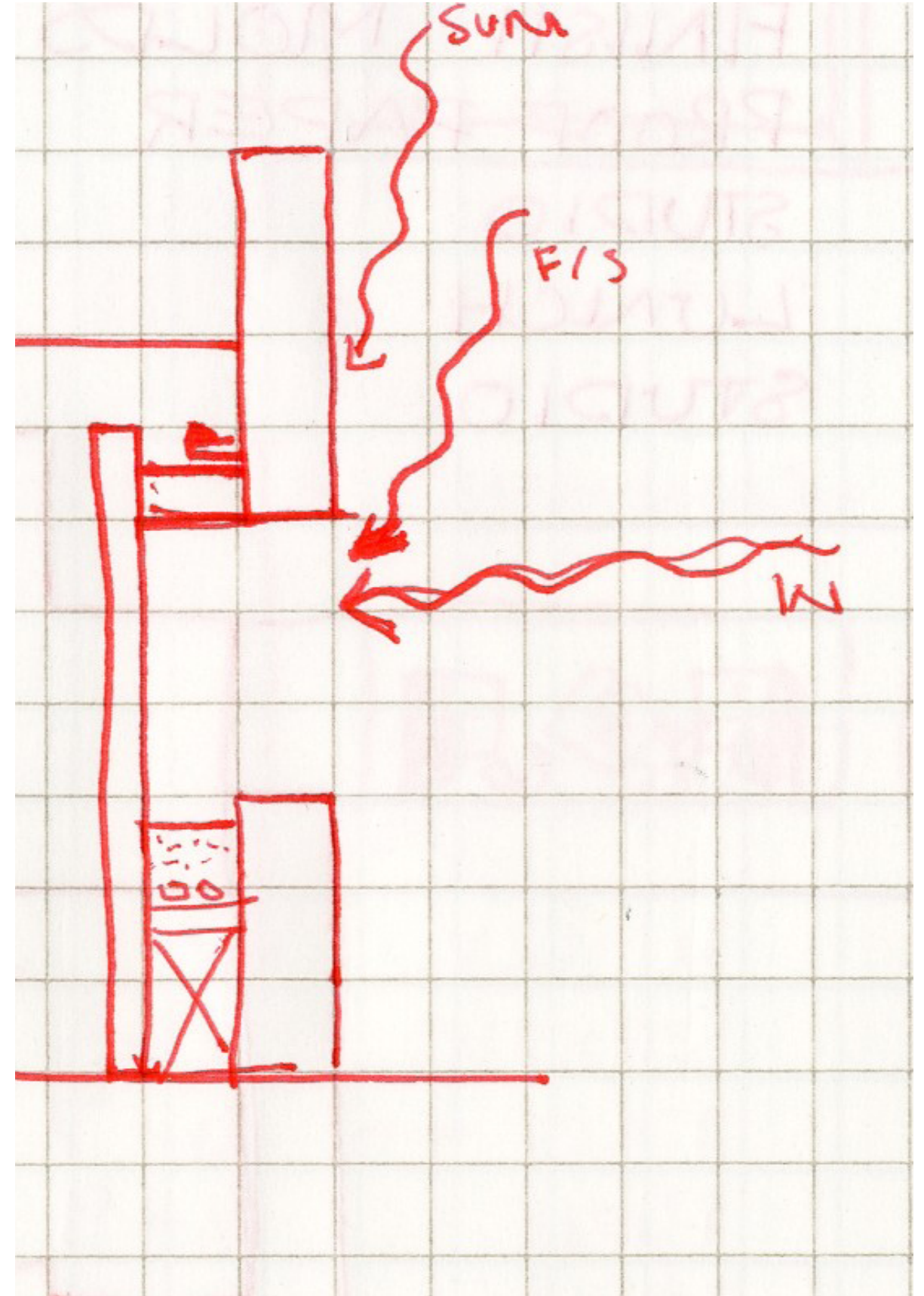


Figure 119 | Process Sketch

PROJECT SOLUTION

For the thesis exhibit presentation boards, a tri-fold brochure, and a short animation were used.

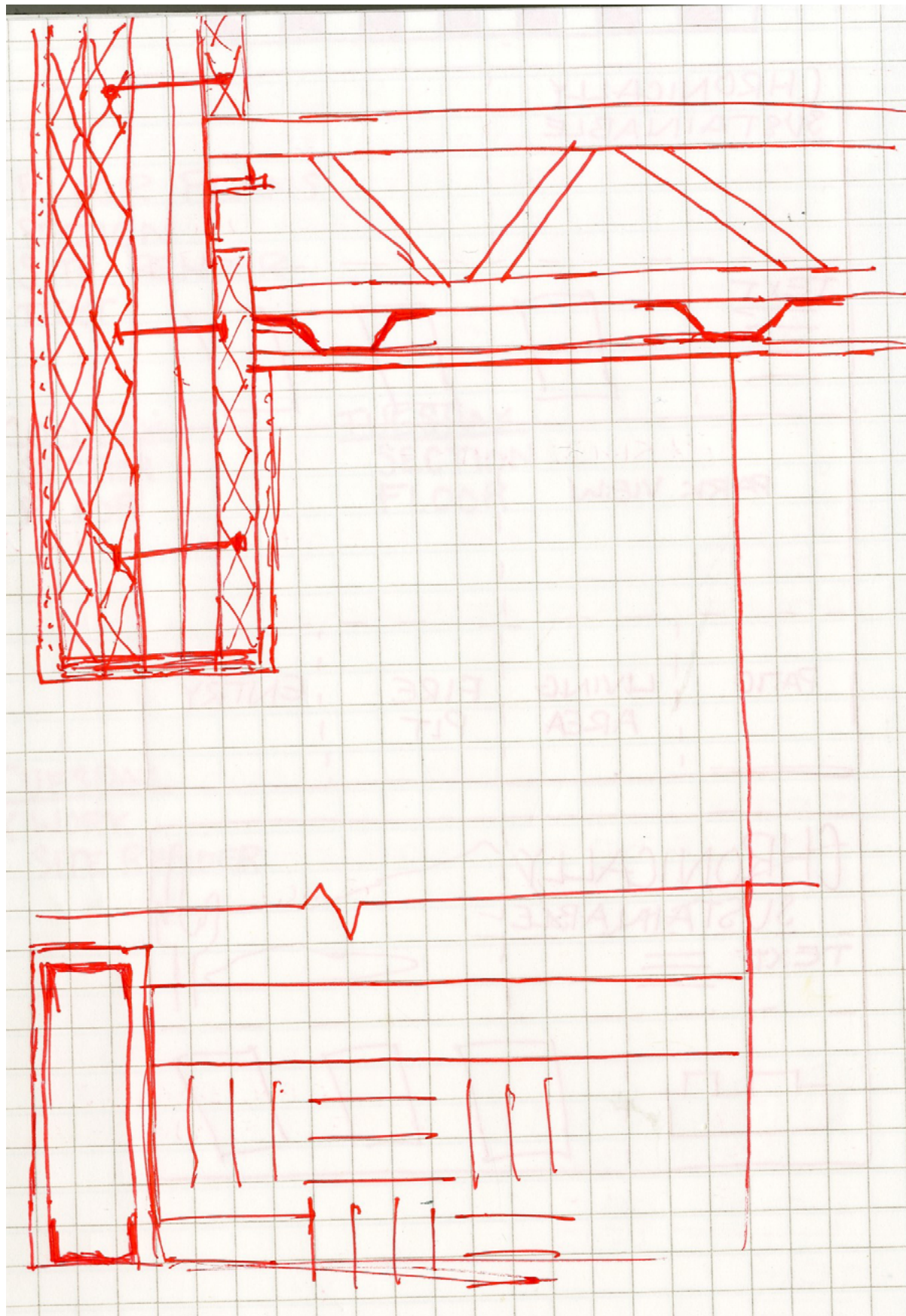


Figure 120 | Process Sketch
170 | Design Solution

Impact of Chronic Illness

Many do not recognize the impact that chronic illness can have unless they themselves have been diagnosed with one. Diseases that are chronic have a variety of symptoms with many being "invisible" such as anxiety and pain. When others can not see your illness there is often a lack of sympathy from others which can cause additional stress and loss of relationships. Those without a physical manifestation may be viewed as healthy and be treated as so. While this can have some positive aspects, there are many negative aspects as these are the illnesses that often receive the least aid. Some may face regular invalidation of their illness as others will deny that a person deserves assistance as they do not appear ill. This can lead to loss of jobs and relationships as some chronic illnesses can impact one's ability to work.

- Asthma ▪ Diabetes
- HIV/AIDS ▪ Cancer
- Heart Disease ▪ Stroke
- Migraines ▪ Mental Illness
- Arthritis ▪ COPD
- Cystic Fibrosis ▪ ALS
- Epilepsy ▪ Osteoporosis
- Endometriosis ▪ Muscular
- Dystrophy ▪ Lyme Disease
- Lupus ▪ Chronic Fatigue
- IBS ▪ Scleroderma
- Parkinson's Disease ▪
- Aids ▪ Colitis
- Immune Dysfunction



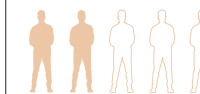
Defining Chronic Illness

Chronic illness is different from acute and terminal illness as there is no way to know if or when one might recover. It becomes a part of everyday life and often times becomes the sufferer's identity. There are many forms of chronic illness as some appear suddenly while other gradually appear over time. Some have flare-ups while others go into periods of remission for extended periods. Even in remission, chronic illness can require strict regimens and ongoing medical treatment. The severity of chronic diseases also complicates the definition of chronic illness as it is hard to measure the effect of a disease as it may affect sufferers differently due to various statistical differences such as age. However, one aspect of chronic illness that is agreed upon by all is that it is never cured and are not completely preventable.



6 in 10

Adults in the US have a chronic illness

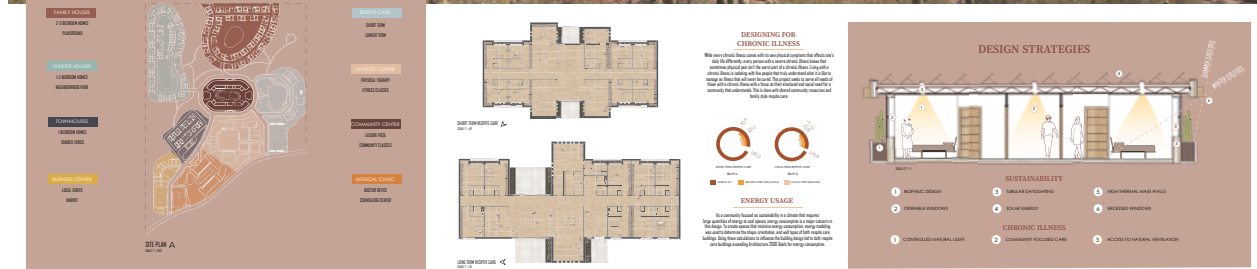


4 in 10

Adults in the US have 2 or more chronic illnesses

Demands of Chronic Illness

- General understanding of the illness
- Research and comprehend the treatment and therapy
- Create a trusting relationship with medical team
- Locating more specialized care if primary care fails to manage symptoms
- Learn symptom management
- Maintain personal relationships through medical uncertainty or symptom flare up
- Avoid emotional and mental isolation
- Increased stress due to constant uncertainty



PERFORMANCE ANALYSIS

Site Response

Building placement and district organization was determined by pedestrian and vehicular traffic, solar energy gains, and views to the surrounding landscape. After an in depth analysis of site influences, such as typography, wind patterns, and solar angles, many iterations of a site plan were created. The best qualities from each iteration were combined to create the final site plan.

Precedent Response

Knowledge gained during the research portion of this project was applied to all aspects of this project. It can be seen through both site organization and various design strategies.

Goals Response

This project had multiple sets of goals including overall project goals and phase goals. These goals were what drove the project and were the leading factor in decision making in this project.

SITE RESPONSE

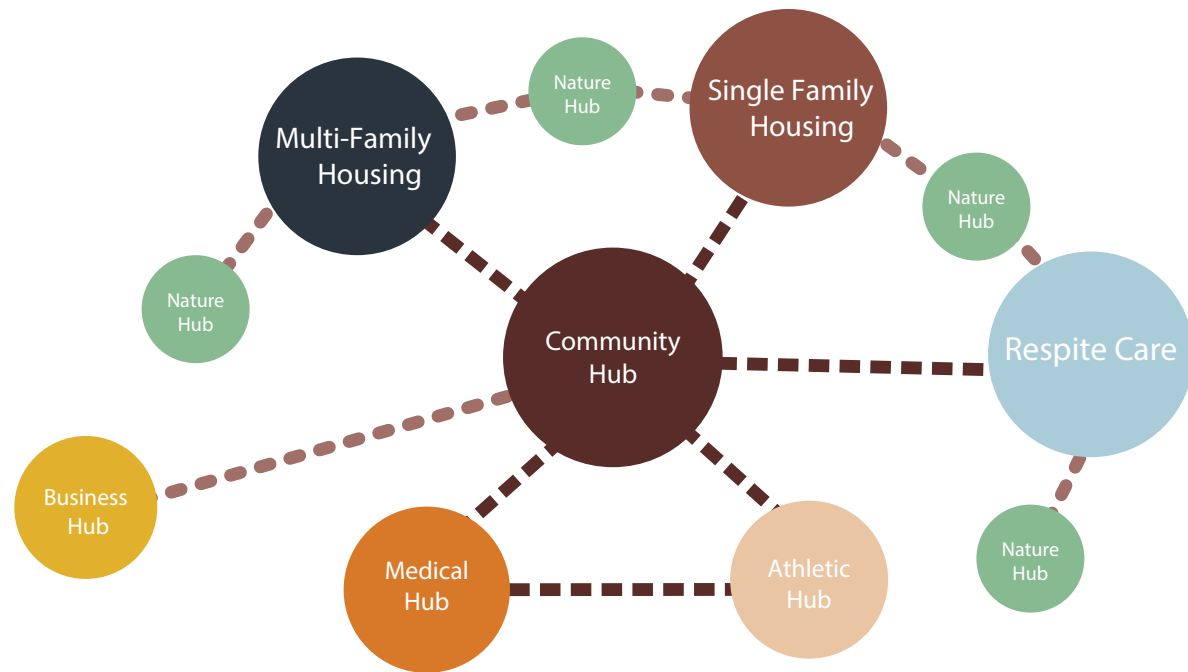


Figure 121 | Spatial Interaction Diagram

Final Site Spatial Interaction

| | | |
|---|--|---|
| FAMILY HOUSES 2-3 BEDROOM HOMES PLAYGROUND | TOWNHOUSES 1 BEDROOM HOMES SHARED YARDS | RESPITE CARE SHORT TERM LONGER TERM |
| STARTER HOUSES 1-2 BEDROOM HOMES NEIGHBORHOOD PARK | BUSINESS CENTER LOCAL SHOPS MARKET | ATHLETIC CENTER PHYSICAL THERAPY FITNESS CLASSES |
| MEDICAL CLINIC DOCTOR OFFICE COUNSELING CENTER | COMMUNITY CENTER LEISURE POOL COMMUNITY CLASSES | |

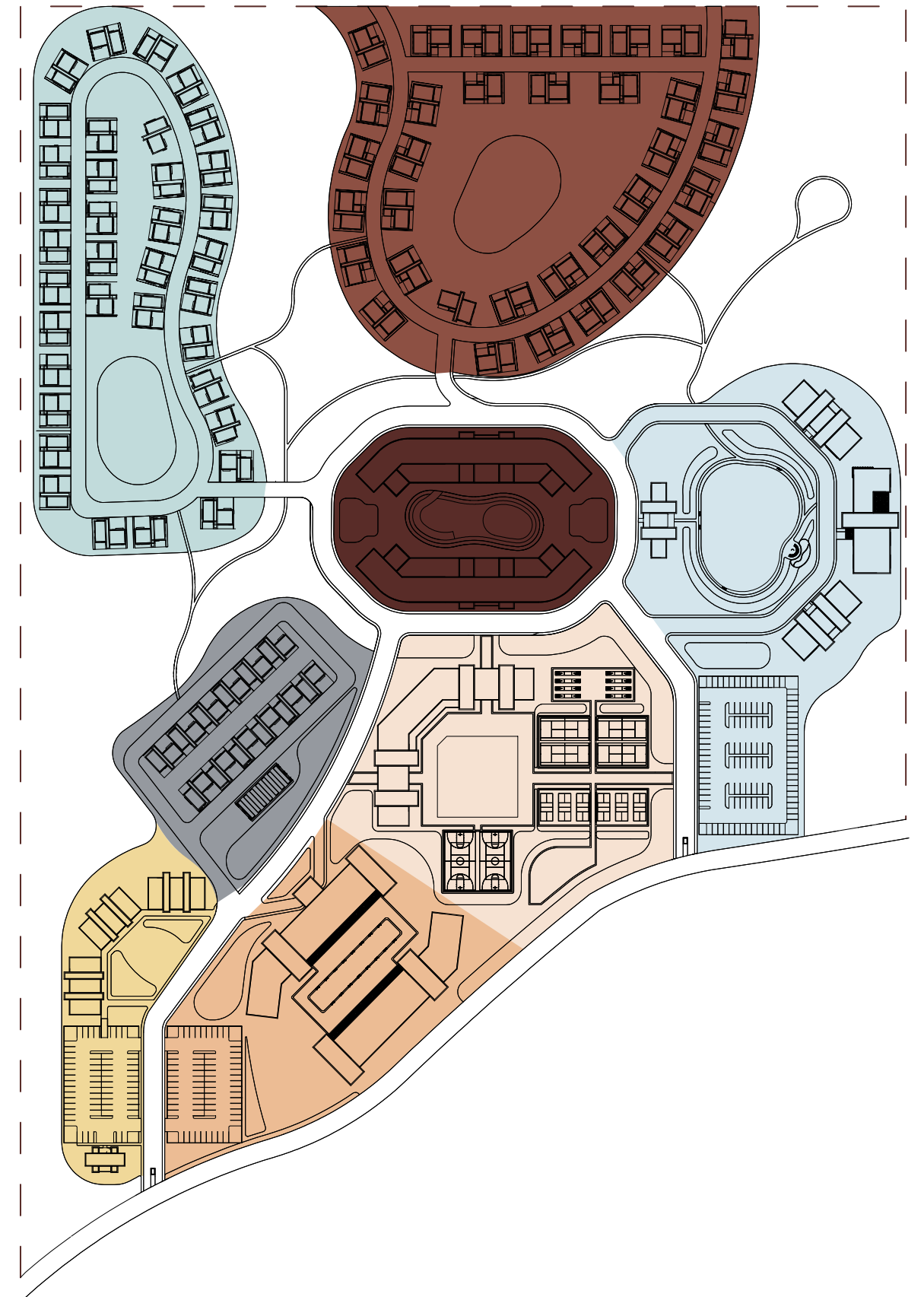


Figure 122 | Site Plan

PRECEDENT RESPONSE

For this project the precedent research completed in the fall semester focused on 3 main topics and answered varying questions. These topics and questions include:

- **Inclusivity and Diversity:**
How does chronic illness effect every day life? How do those with chronic illness find community?
- **Sustainability & Energy Use:**
How does one create a design that is energy efficient and uses the environment around it to improve the quality of life for those in the building?
- **Social, Cultural & Historical Impact:**
How does the history and culture of an area impact a community? How can you intergrate an existing culture into a new community?

The questions answered in the research phase were directly applied to this project. The result can be seen through the site organization, integration of existing culture into the community, and the use of multiple passive design strategies.

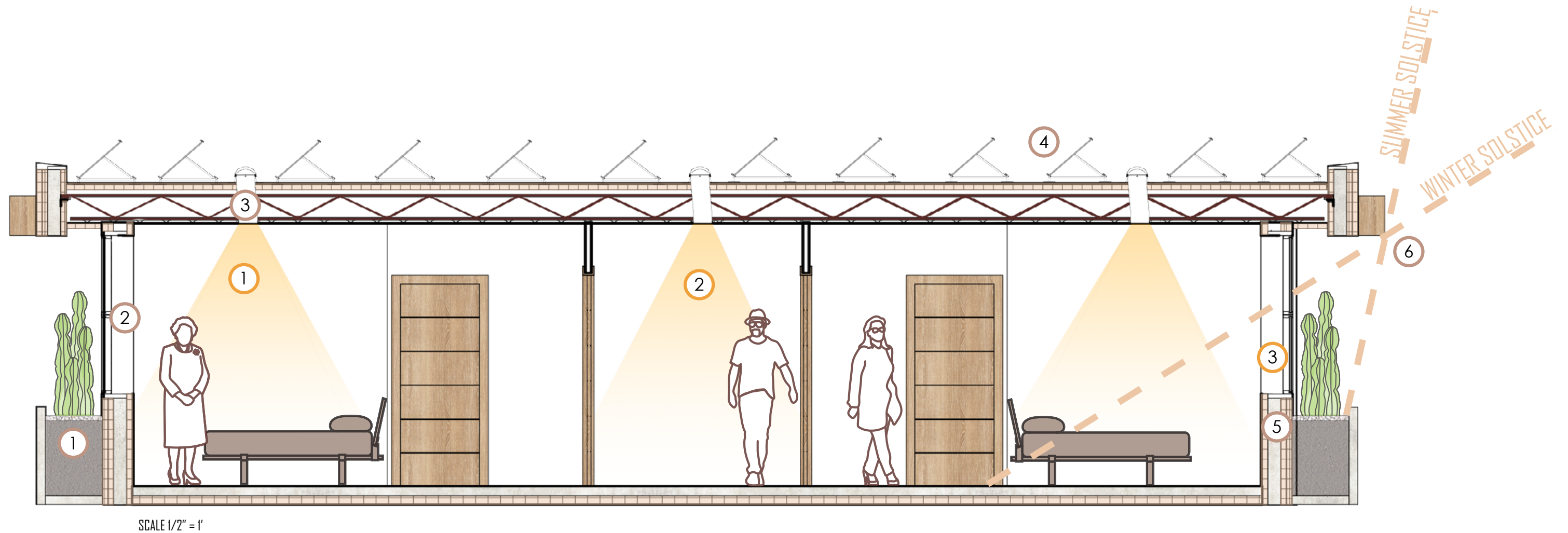


Figure 123 | Long Term Respite Care



Figure 124 | Short Term Respite Care

Design Strategies



SCALE 1/2" = 1'

SUSTAINABILITY

- 1 BIOPHILIC DESIGN
- 2 OPERABLE WINDOWS
- 3 TUBULAR DAYLIGHTING
- 4 SOLAR ENERGY
- 5 HIGH THERMAL MASS WALLS
- 6 RECESSED WINDOWS

CHRONIC ILLNESS

- 1 CONTROLLED NATURAL LIGHT
- 2 COMMUNITY FOCUSED CARE
- 3 ACCESS TO NATURAL VENTILATION

GOALS RESPONSE

Investigate how to design for the chronically ill and disabled:

While every chronic illness comes with its own physical symptoms that effects one's daily life differently, every person with a severe chronic illness knows that sometimes physical pain isn't the worst part of a chronic illness. This project seeks to serve all needs of those with a chronic illness with a focus on their emotional and social need for a community that understands.

Educate others on living with chronic illness:

This project has helped bring more awareness to what chronic illness is as well as the impacts of living with a chronic illness through both the thesis exhibit as well as my verbal presentation.

Consider the effect chronic illness on the ability to live a sustainable life:

Living sustainably with a chronic illness can be hard but with use of solar energy this community can live more sustainably due to less reliance on non-renewable energy.

Investigate the feasibility of a sustainable community in a naturally unsustainable climate:

Through energy modeling it has been shown that it is possible to create a community that can exist sustainably in an extreme climate.

Master Planning Goals



Preserve 25% of the site as its existing natural desert landscape

With a large portion of the site preserved as a nature preserve, this design exceeds this goal with over 30% of the site being left as its existing natural desert lanscape.



Maximize views to mountains and desert with site organization and building

Each section of the site are oriented to give maximum opportunities for buildings to have views of both the desert and mountains. From there buildings forms were used to further maximize views to the surrounding landscape.



Create districts that are independent but interact to encourage engagement within the community

Each district of the community serves a need of the residents but are organized to allow interactions between districts that encourage a sense of community.

Master Planning Goals



Design community focused care facility that meets social, emotional, and physical needs of the chronically ill

While every chronic illness comes with its own physical symptoms that effects one's daily life differently, every person with a severe chronic illness knows that sometimes physical pain isn't the worst part of a chronic illness. his project seeks to serve all needs of those with a chronic illness with a focus on their emotional and social need for a community that understands. This is done with shared community resources and family style respite care.



Select materials and wall compositions that maximize energy efficiency and thermal comfort

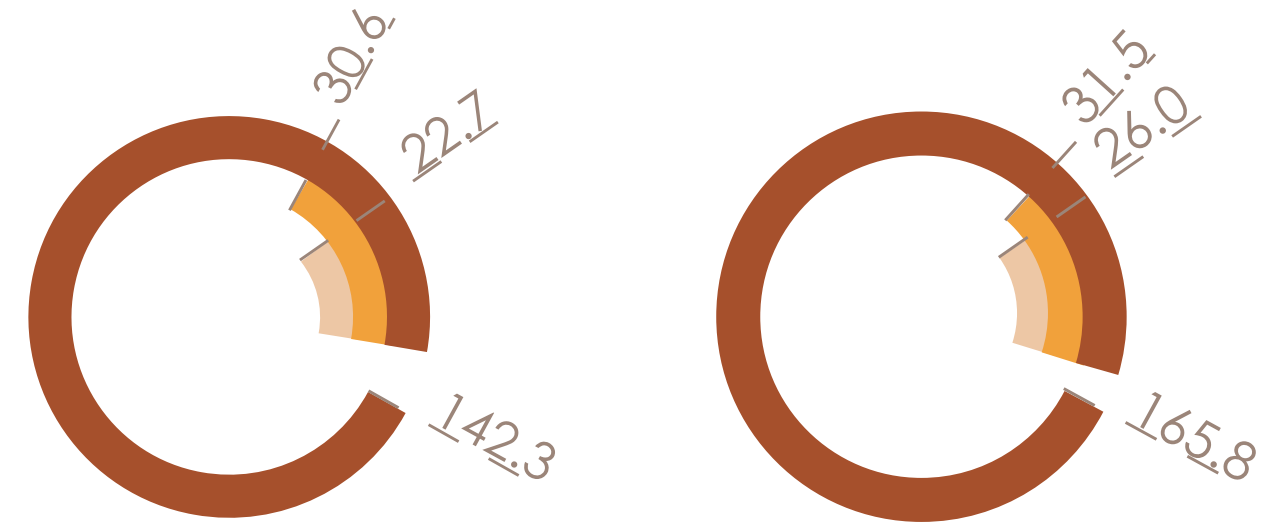
Energy efficiency and thermal comfort were ensured through energy modeling to determine glazing placement, building orientation, and building form as well as through R-value calculations.



Create a design that reflects the history and culture of the Sonoran desert

Taking inspiration from local Native American artwork, patterned shading devices are used to cast unique and interesting shadows across both interior and exterior spaces. Materials were influenced by vernacular architecture.

Energy Consumption



SHORT TERM RESPITE CARE

kBtu/ft²/yr

LONG TERM RESPITE CARE

kBtu/ft²/yr



ASHRAE 90.1



ARCHITECTURE 2030 GOALS



ACTUAL PERFORMANCE

As a community focused on sustainability in a climate that requires large quantities of energy to cool spaces, energy consumption is a major concern in this design. To create spaces that minimize energy consumption, energy modeling was used to determine the shape, orientation, and wall types of both respite care buildings. Using these calculations to influence the building design led to both respite care buildings exceeding Architecture 2030 Goals for energy consumption.

DIGITAL PRESENTATION

Chronically Sustainable

Creating a Sustainable Community for
the Chronically Ill

Unifying Idea



A SUSTAINABLE COMMUNITY that caters to the SOCIAL, ECONOMIC, and EMOTIONAL NEEDS of the chronically ill in an extreme climate.

Project Goals



Create a place of connection and community for the chronically ill



Investigate the feasibility of a sustainable community in a naturally unsustainable climate



Create a design that respects the cultures and history within the Sonoran desert



Design respite care that serves the social, emotional, and physical needs of the chronically ill

Sustainability

"The word sustainability goes beyond the reaction it makes to the environment, but it is a concept that has the capacity to endure...Sustainability interacts with ENVIRONMENTAL, ECONOMIC and SOCIAL issues. This concept contributes to different areas which create SOCIAL and ECOLOGICAL CONSEQUENCES in human activity. Sustainability, as mentioned, involves various aspects of human life, which need to be put into practice in the field of architecture because it is what causes us the greatest impact as human beings"

-Jimena Ávalos , Regina Villarreal , Valeria Cárdenas, Ana Cristina García-Luna Romero

Chronic Illness

A condition NOT CURED BY MEDICAL INTERVENTION requiring periodic monitoring and supportive care to reduce the degree of illness, maximize the person's functioning and responsibility for self-care.

-L. Cluff

Ongoing medical condition with spectrum of SOCIAL, ECONOMIC, AND BEHAVIORAL COMPLICATIONS that require meaningful and continuous personal and professional involvement.

-Feldman

Chronic Illnesses

Asthma Diabetes HIV/AIDS Cancer Heart
Disease Parkinson's Disease Migraines ALS
Mental Illness Arthritis COPD Cystic Fibrosis
Epilepsy Osteoporosis Endometriosis IBS
Muscular Dystrophy Lyme Disease Lupus
Chronic Fatigue Scleroderma Stroke Colitis

Project Focus

Master Planning

Respite Care

This Community

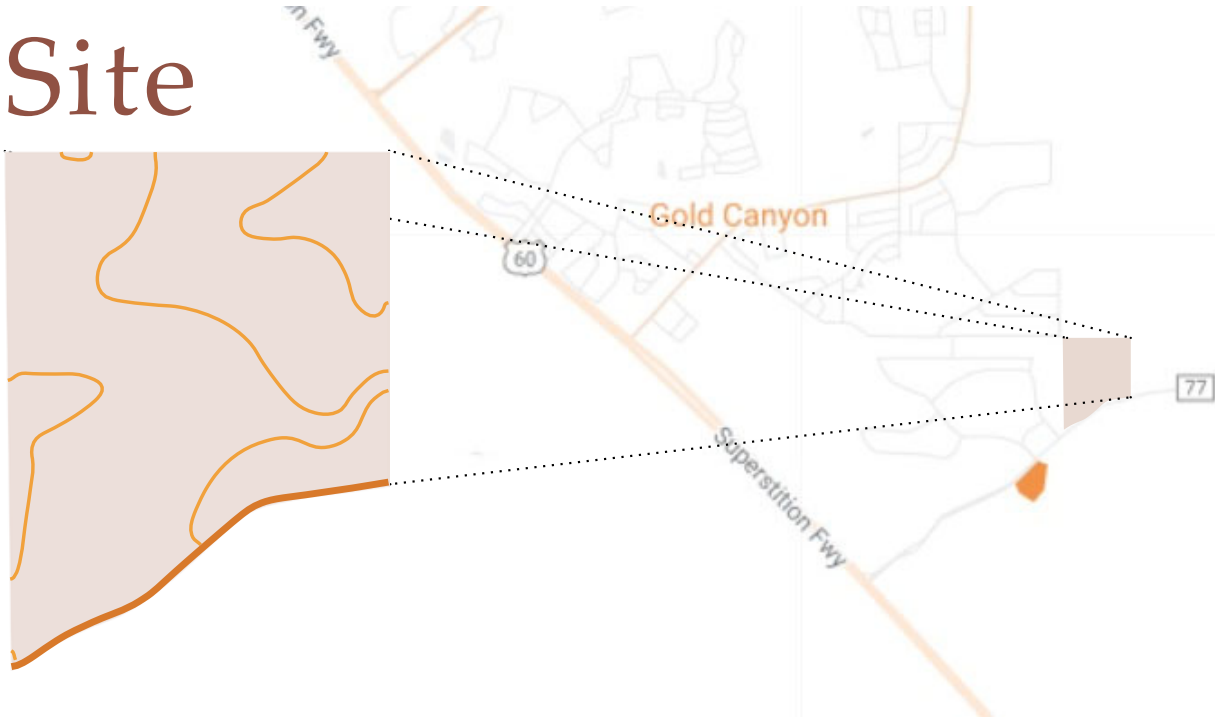
Is

- Age Inclusive
- Support Network
- Community Understanding
- Inclusive
- Easy Access to Health Care
- Mental Health Support

Isn't

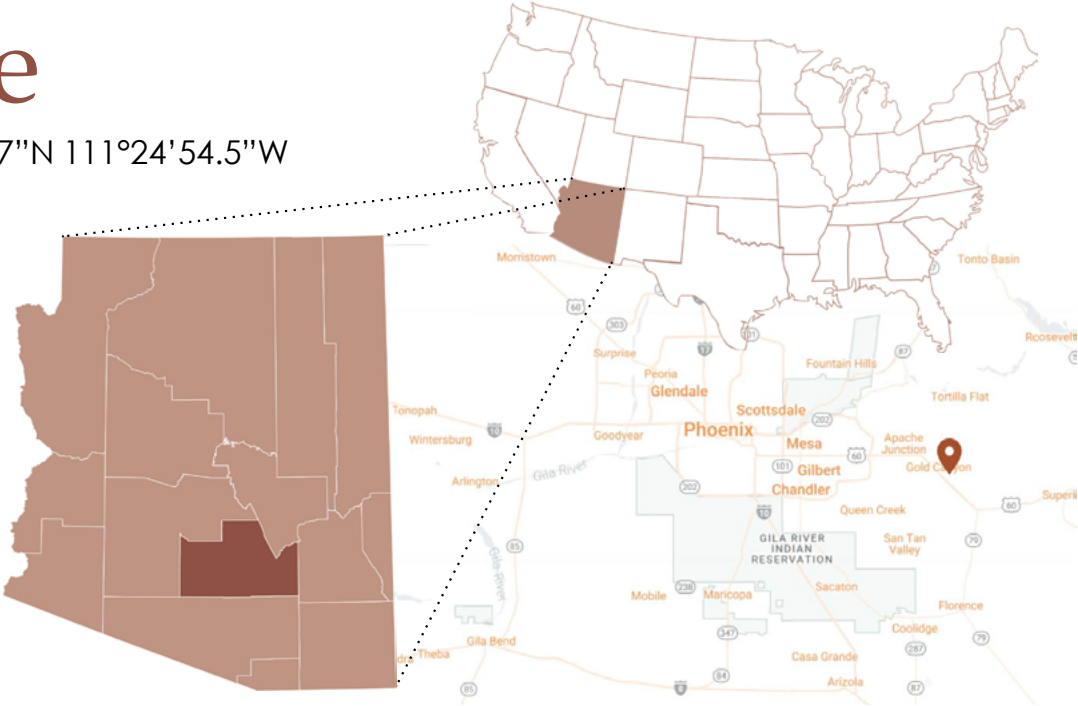
- Senior Citizen Community
- Nursing Home
- Hospice Care
- Resort
- Temporary Housing

Site



Site

33°21'18.7"N 111°24'54.5"W



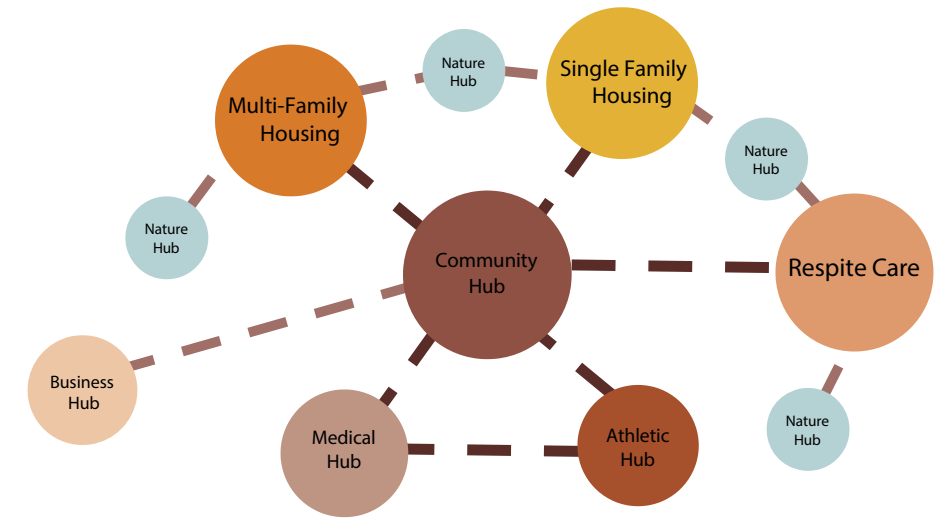
Site Character



Phase One

Master Planning

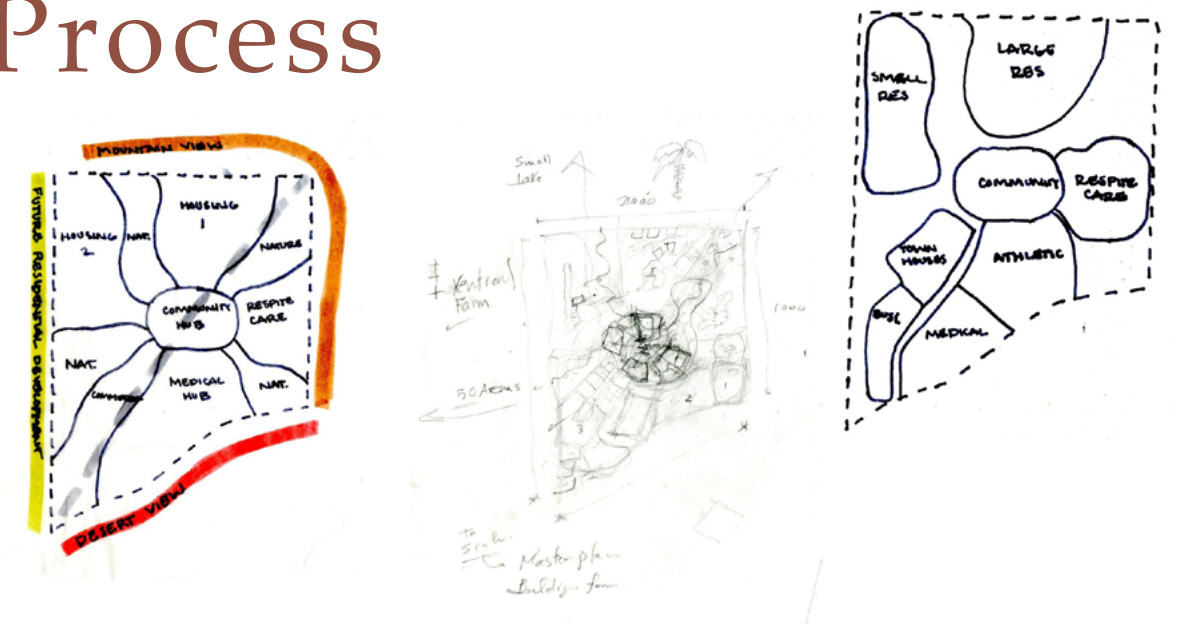
Site Interaction



Phase Goals

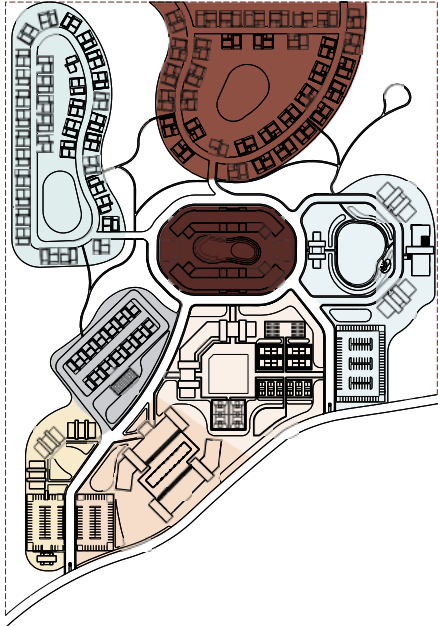
- Preserve 25% of the site as its existing natural desert landscape
- Maximize views to mountains and desert with site organization and building orientation
- Create districts that are independent but interact to encourage engagement within the community

Process



Master Plan

- FAMILY HOUSES**
2-3 BEDROOM HOMES
PLAYGROUND
- TOWNHOUSES**
1 BEDROOM HOMES
SHARED YARDS
- RESPITE CARE**
SHORT TERM
LONGER TERM
- STARTER HOUSES**
1-2 BEDROOM HOMES
NEIGHBORHOOD PARK
- BUSINESS CENTER**
LOCAL SHOPS
MARKET
- ATHLETIC CENTER**
PHYSICAL THERAPY
FITNESS CLASSES
- MEDICAL CLINIC**
DOCTOR OFFICE
COUNSELING CENTER
- COMMUNITY CENTER**
LEISURE POOL
COMMUNITY CLASSES



Respite Care




Respite care provides SHORT-TERM RELIEF for PRIMARY CAREGIVERS and can offer MORE FREEDOM to the CHRONICALLY ILL. It can be arranged for just an afternoon or for several days or weeks.

Phase Two

Respite Care

Respite Care

-  Design community focused care facility that meets social, emotional, and physical needs of the chronically ill
-  Select materials and wall compositions that maximize energy efficiency and thermal comfort
-  Create a design that reflects the history and culture of the Sonoran desert

Inspiration



Vernacular Architecture



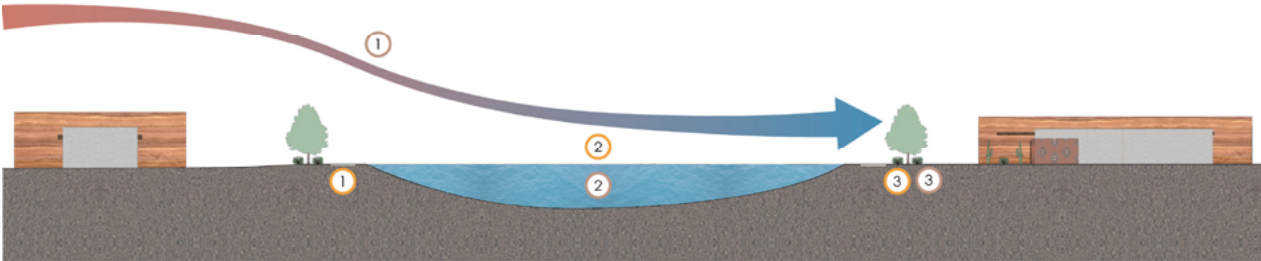
Superstition Mountains



Desert Oasis

Site Design

- ① OASIS EFFECT
- ② GRAY WATER POND
- ③ NATIVE VEGETATION
- ① ACCESSIBLE PATHWAYS
- ② REFLECTION SPACES
- ③ LOW ALLERGEN VEGETATION



Site Design



Site Design



Respite Care



Short Term Respite Care



Short Term Respite Care



Short Term Respite Care



Long Term Respite Care



Long Term Respite Care



Long Term Respite Care

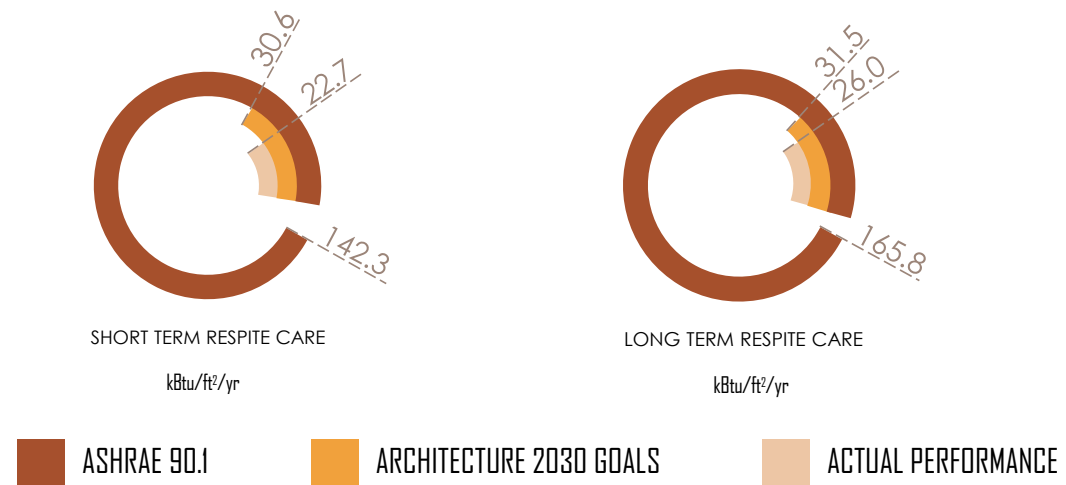


Design Strategies



- | | | |
|----------------------------|--------------------------|---------------------------------|
| SCALE 1/2" = 1' | | |
| SUSTAINABILITY | | |
| 1 BIOPHILIC DESIGN | 3 TUBULAR DAYLIGHTING | 5 HIGH THERMAL MASS WALLS |
| 2 OPERABLE WINDOWS | 4 SOLAR ENERGY | 6 RECESSED WINDOWS |
| CHRONIC ILLNESS | | |
| 1 CONTROLLED NATURAL LIGHT | 2 COMMUNITY FOCUSED CARE | 3 ACCESS TO NATURAL VENTILATION |

Energy Efficiency



APPENDIX

Supplemental Materials

Case Studies

Superstition Views | Gold Canyon, Arizona

Firstenburg Community Center | Vancouver, Washington

Desert Living Center & Gardens | Las Vegas, Nevada

Red Mountain Campus Saguaro Building | Mesa, Arizona



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Previous Studio Experience

2nd Year 2018-2019

Fall Studio: Cindy Urness Meditation Space | Boathouse

Spring Studio: Amar Hussein Dwelling | Mixed-Use

3rd Year 2019-2020

Fall Studio: Niloufar Alenjery Refugee Center | City Center

Spring Studio: Regin Schwaen 21st Century House | Steel Office Building

4th Year 2020-2021

Fall Studio: David Cruthfield Capstone Project

Spring Studio: Amar Hussein Marvin Window House | Miami Urban Design

5th Year 2021-2022

Fall Studio: Lance Josal Amtrack High Speed Train Station