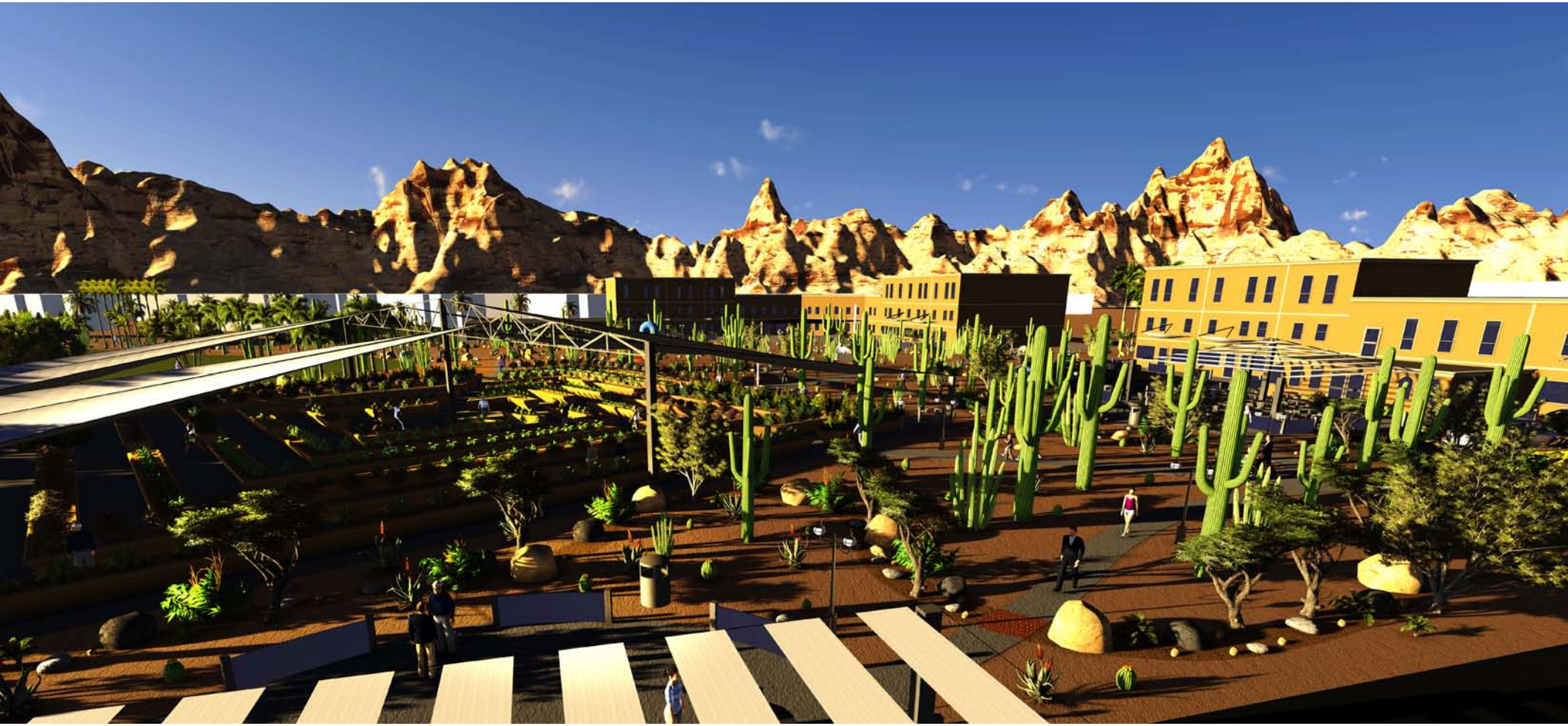
Fountain Plaza and Art Gardens



Aaron Hendrickson, Fall 2013, North Dakota State University

Fountain Plaza and Art Gardens

Urban Revitalization through Urban Agriculture

A Design Thesis Submitted to the

Department of Architecture and Landscape Architecture

of North Dakota State University

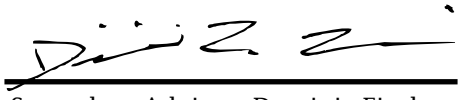
By

Aaron Hendrickson

In Partial Fulfillment of the Requirements for the Degree of

Bachelor of Landscape Architecture

Primary Advisor: Matthew Kirkwood



Secondary Advisor: Dominic Fischer

May 9th 2014

Fargo, North Dakota

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Contents

Abstract

Redeveloping Fountain Hills, Arizona downtown district into an Urban Agricultural installation with art gardens, Fountain Plaza and Art Gardens will provide commerce and produce to the city. Is it possible to use Urban Agriculture to mend a broken downtown center and make it a productive landscape that provides food, entertainment, and therapy to residents and visitors? Can the elderly benefit from an urban agricultural installation? Through research, case studies and literary reviews, I will prove that urban agriculture can revitalize Fountain Hills, Arizona. This will help the field of landscape architecture by providing an example that urban agriculture can be done within harsh climates. Through the research, exploring the topics of permaculture, therapy gardens, and urban revitalization all contribute to how Fountain Plaza and Art Gardens will function. Transforming an empty lot into a downtown center for gathering and commerce, Fountain Plaza and Art Gardens will promote, revitalize and restore the sense of pride in Fountain Hills.

Chapter One: Project Typology and Literature Review

1 Fountain Plaza and Art Gardens

Introduction:

According to David Tracey in *Urban Agriculture: Ideas and Designs for the New Food Revolution* (2011) “The city of the future is green and delicious” (p.1) Urban agriculture is an up and coming part of landscape architecture as David Tracey said it is the future. However, it is not a new concept. During WWII victory gardens were planted all over the United States to help with the national food shortage. According to www.livinghistoryfarm.org, a historical farm society in York, Nebraska,

The US Department of Agriculture estimates that more than 20 million victory gardens were planted. Fruit and vegetables harvested in these home and community plots was estimated to be 9-10 million tons, an amount equal to all commercial production of fresh vegetables.

The concept of urban agriculture has worked before and with the rise in popularity of the green movement in today’s society, it makes sense that urban agriculture will become more and more of a common practice. How can we incorporate urban agriculture within a downtown setting and make it into a green way connection with commerce and places for people to enjoy? This thesis will explore how a landscape design can accomplish just that.

Typology:

The concept of this thesis is to do an urban agricultural development that functions as a greenway connection to revitalize a downtown setting within a city. Breakings down urban agriculture into its individual word parts to define the elements are as such: urban meaning "of or relating to cities and the people who live in them" and agriculture meaning "the science, art, or practice of cultivating the soil, producing crops, and raising livestock and in varying degrees the preparation and marketing of the resulting products" (Merriam-Webster Online). When one combines simplifies those definitions, one gets the production of food within the city. To further develop the concept of a greenway connection is a unique stand point of this thesis.

A greenway is defined as "a corridor of undeveloped land preserved for recreational use or environmental protection" (Merriam-Webster Online). Having the benefit of urban agriculture and using that to make a greenway connection and to revitalize a downtown area is what I will discover further on in this thesis. This becomes a destination for visitors and residents to pass through and enjoy. Whether it serves as a visitor's main destination or a person/persons passing through makes for a broader demographic. Growing crops in the Southwest of the United States of America is much different then growing them in the Midwest region of America. I was born, raised and currently reside in North Dakota. North Dakota is a state that is known for its agriculture because of its fertile soils and good growing conditions (Enz, 2003). This research takes on the challenge to make a productive landscape within the southwest and make it affordable to sustain.

This research helps the landscape architecture field by providing an

example that urban agriculture can rejuvenate a downtown setting. It also proves through programming that it will help improve the commerce district as well as the health and well being of elderly within the community. Urban agriculture can show that growing crops is a beautifying feature that can be done in any climate, culture, and city. The education of urban residents on where there food comes from, what the actual physical plant looks like and the effort that it takes to grow food for people to eat is a way this thesis branches out for not only the landscape architecture field but the general knowledge of the public. Urban Agriculture provides an educational space for youth as well as adults who may have never tried to grow a plant for consumption. Urban Agriculture can further more bring communities together and provide a unique opportunity for physical theory.

Research Questions:

How can we incorporate urban agriculture within a downtown setting and make it into a green way connection with commerce and areas within the site for people to enjoy? Also, how does the revitalization of a downtown district impact the commerce as well as the sense of community? Does the community pull together or does the influx of visitors take over the feeling of the city? Can urban agriculture help with the elderly population within the surrounding area of the site? These are all questions that will be discussed throughout this thesis. Discussing the importance of the questions below will drive the research that follows.

1: What are Productive Landscapes/ Urban Agriculture?

2: How to do Urban Revitalization?

3: What is an Urban Setting?

4: How do you mend a Broken Community/ Center?

5: How to counter act the "Snowbird Syndrome"?

6: How does Water Management Effect Production of Plants for Food?

7: What Accessibility requirements are for the Public?

8: How to establish a Greenway Connection?

9: What Gives a Sense of Community?

10: How do you Increase Commerce?

11: Can an Elderly Therapy Garden be encompassed in Urban Agriculture?

Site Information:

The first step in any project is defining parameters that a designer deems necessary to create a project. This starts with site criteria and then in to research topics that can further develop within your design. When looking at choosing a site to take on the task of designing for an urban agricultural installation, the site criteria are as follows:

1: Urban/ Downtown with population of 10,000 people or more

2: Area 10 to 50 acres in size

3: Is in Close Proximity to Parks and Green Spaces

4: Site is Easy to Walk to

5: Connection to Community Buildings

6: Connection to Commerce District

7: Connection to Retirement and Assisted Living Facilities

8: To be in the Southwest United States

9: Soil Conditions

10: Understanding the Amount of Rain an Area Receives

11: Growing Seasons

12: Near Farmers Markets

13: Tree Cover and Sun exposure

14: Understanding the Climate of an Area

The site is best suited to be within a city center that has a large area to develop. This will keep construction costs lower and promote the city's new growth. The city is best suited to have a minimum of 10,000 residents to make sure there is abundance of residents who can visit and participate within the site. The site promotes the best chance of success when the area is at least 10 acres in size to make the growing area for the plants big enough to produce an adequate amount of commodities (such as sweet corn, carrots, peas, beans and more) to make the site economically viable. Having connections to community buildings and a commerce district serve to further support the use and popularity of the site, with the draw of visitors and residents.

To further help the community, having a connection with retirement and assisted living facilities can invoke a new programmatic element that brings the community together. The farmers market is a way to distribute the communities that are produced not only from the site but from area farmers. The ideal site is to be located in the southwest. Being that I have lived in North Dakota my whole life, I would like to further my horizons and explore new parts of the United States through new designs. It will also challenge me to learn about different cultures, plant pallets and design practices within this research.

Any time someone is going to grow a plant they need some simple knowledge about the science behind plant growth. Soil conditions, water requirements, growing seasons and types of climate all are big factors when trying to determine what plants to pick out (Tracey, 2011). The importance of soil condition is shown in Lisa Taylor's book *Your Farm in the City An Urban Dweller's Guide to Growing Food and Raising Animals* has a whole chapter based on soils and how to test your soil from making proper PH levels, to fertilizers, and to moisture content within the soil. Along with the understanding of the how a plant grows, exposure to sun light can make a great deal of difference. According to Leslie Bennett and Stefani Bittner authors of *The Beautiful Edible Garden Design a Stylish Outdoor Space Using Vegetables, Fruits, and Herbs* "Plants need light in order to grow, but just how much light is required depends on the plant. Understanding your garden's sun exposure is a crucial step in choosing plants that will thrive in your garden." (Bennett&Bittner 2013).

Site challenges and opportunities:

Is it possible to use Urban Agriculture to mend a broken downtown center and make it a productive landscape that provides food, entertainment, and therapy to residents and visitors? With this question I define what urban agriculture/productive landscape are, and to see how they can bring a community together while also helping the elderly throughout this thesis. This may be through programmatic events that combine the elderly with a younger crowd, or through community events. I hope to find the effect of a revitalized downtown area and how that affects its commerce. I hypothesize that urban agriculture can increase commerce in a downtown area, create a greenway connection, mend a broken sense of community, and be accessible for the public and elderly for programs and therapy. These topics will be discussed more in-depth through the use of the case studies and literature reviews.

Case study:

Lafayette Greens

Detroit, Michigan

Project Details:

Location: Detroit, Michigan

Years Constructed: 2010-2011

Size: ½ Acre

Designer: Beth Hagenbuch (Lead Designer) and Kenneth Weikal (Landscape Architect)

Research Points:

1: Urban Agriculture, 2: Urban Revitalization, 4: Broken Community or Center,
3: Urban Setting, 8: Greenway Connection, 6: Water Management Practices

Project History:

Lafayette Greens is constructed on the site of the Lafayette Building that was built in 1923 in downtown Detroit, Michigan. Due to the economic downturn of Detroit, the Lafayette building closed in 1997. The building was in ruins like many of Detroit's historic buildings. In 2009 Compuware Corporation, a technology performance company, bought the land and demolished the run down building. Compuware approached Beth Hagenbuch and Kenneth Weikal of Kenneth Weikal Landscape Architecture (KWLA) of Farmington Hills, MI to design an outdoor space that used urban agriculture to beautify their half acre lot outside their world headquarters. According to Beth Hagenbuch, the leading designer of the project, "KWLA believes productive gardens in highly public places have the potential to bring together green space, public space, public health, community engagement and sustainability in a powerful way." (2013)

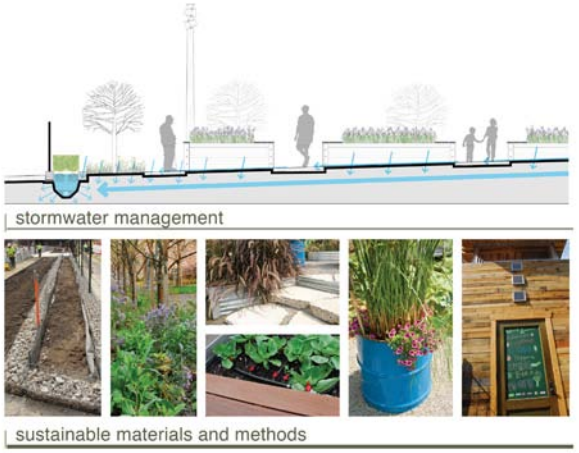
This image produced by Beth Hagenbuch and accessed from the ASLA website is the site plan for Lafayette Greens. It shows the overall design with the many different design components.

The Design:

Throughout the design process there were many goals that the client, Compuware Corporation, set forth. The Lafayette Greens official websites states:

To beautify downtown Detroit in an innovative and hands-on manner; to create a space where employees, our downtown neighbors and visitors can learn about and enjoy gardening in an urban setting; and to encourage other downtown-based businesses and residents to reach out and transform the spaces that surround them. (Compuware Corporation, 2013)

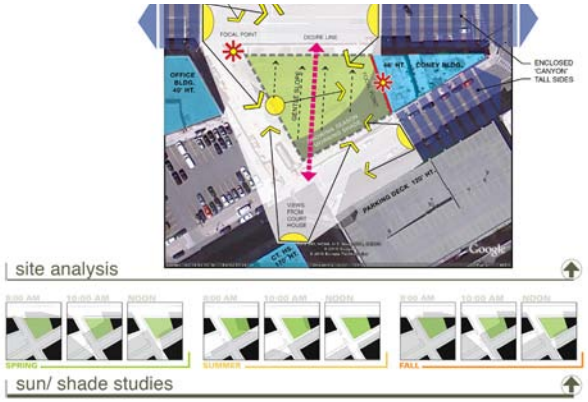
Other goals of the project were to make it sustainable, incorporate recycled products, use a storm water management system, and increase the amount of biodiversity.



This image produced by Beth Hagenbuch and accessed from the ASLA website. This image shows the study to use sustainable material and the storm water management system in place.

Keeping these goals in mind, and only having a half acre with which to work with, was a challenge to make this a success. Throughout the site analysis process, there were factors that drove the design to its current layout. An extensive sun and shade study of the site determined where

the raised planter boxes should be placed for the best growing spots on



This image produced by Beth Hagenbuch and accessed from the ASLA website. This graphic shows the extensive sun shade study and the site analysis.

the site, since the site is surrounded by tall skyscrapers. The circulation was another concern, because the site is a center for pedestrians to walk to and from the surrounding buildings, the design had to incorporate a proper flow of people that does not disturb the garden area.

Construction of Lafayette Greens started in the spring of 2010 with the completion in the fall of 2011 "With 35 raised beds, fruit trees, a children's garden and more, Lafayette Greens works as a learning garden with edible foods and green space for relaxation" (Hagenbuch, 2013).

This image produced by Beth Hagenbuch and accessed from the ASLA website. This is the site plan for Lafayette Greens showing the many different elements within the design.

Analysis:

Lafayette Greens illustrates that urban agriculture can create a beautiful and productive landscape within a downtown setting. This case study addresses the urban agriculture, urban revitalization, broken community, sense of community, urban setting, greenway connection, and water management considerations. Lafayette Greens takes an urban agricultural setting, places it within a failing part of a city and revitalizes an area to become a city strong point to bring pride. It revitalized the half acre lot into an area that workers and visitors can both enjoy. This site took a part of the broken community and made it into a center for learning and congregating with friends and family. Lafayette Greens provides a greenway connection to the surrounding buildings and sets a starting point for more greenways to be built. Having the storm water

management system and use of sustainable materials proves that understanding water use and the use of the materials can make a site even successful. This proves that urban agriculture can be a viable way to redesign an urban center and provide more than just produce. One of the design aspects that I learned is understanding of the site is critical. Doing an extensive sun and shade analysis map is going to be a must in my future design. Knowing where the proper amount of sunlight and shade spots will help determine where some of the planter beds will go. Furthermore, understanding how more direct sunlight may take away moisture from the soil which then means those areas would need to be watered more frequently to keep the moisture level at a proper saturation. Understanding how people will be interacting and proceeding though my site should be determining factors on how I layout design features. I do not want to impede on either foot traffic or vehicular traffic. If the site is not easily accessible, people may lose interest in coming to the site or may be unable to.

The use of a storm water management system will be a major part of the design within the desert of Arizona. I will be using some of the techniques that are present within Lafayette Greens to help provide the sustainable infrastructure and water conservation. Lafayette Greens also illustrates that urban agriculture brings people together and forms a community. The park offers different educational programs and resources for the public to get involved (Compuware Corporation, 2013). On the official park website, there is a section dedicated to volunteering which says, “We welcome people of every age, creed and ability to come to Lafayette Greens to enjoy and relax in the space, get involved in educational opportunities and engage with other members of the community through the act of gardening” (Compuware Corporation, 2013).

Case Study:

Beacon Food Forest

Seattle, Washington

Project Details:

Location: Seattle, Washington

Year: 2010-Present

Size: 7 acres

Designer: Margarett Harrison (Landscape Architect), and Jenny Pell (Permaculture Designer)

Project History:

Beacon Food forest in Seattle, Washington is being built in Jefferson Park. Jefferson Park is one of the city's older parks and the land was not being used to its fullest potential. The area chosen for the food forest is a on a south facing hill with lots of sun exposure. The prior site condition was a grassy hill that community members were not using. In 2010, the City of Seattle granted $20,000 to start the design process of an urban fruit forest. Margarett Harrison, the lead landscape architect, collaborated with Jenny Pell, a permaculture designer, to develop a plan with this seven acre design. In December of 2011, $100,000 was donated to the project to help kick start the install. (Beacon Food Forrest, 2013)

This image produced by Margarett Harrison and accessed from the Beacon Food Forest website. This image shows the installed plan up to the current date.

Design:

One unique aspect of this installation is that the community is installing and building this project it is not being constructed by a company. As they slowly build this site into its fullest potential the community gets more and more

This image produced by Margarett Harrison and accessed from the Beacon Food Forest website. This image is the entire site plan for the Beacon Food Forest. It details out where the community plots, open and gathering areas, and the different shrubs and trees will be planted.

pride with their work. This is an ongoing installation with less than half of the design completed to date. As the mission statement from the official website of the Beacon Food Forest states, "Our goal is to design, plant and grow an edible urban forest garden that inspires our community to gather together, grow our own food and rehabilitate our local ecosystem" (Beacon Food Forest, 2013). As the design gets more installed the mission statement becomes more prevalent with the site.

Analysis:

Beacon Food Forest fulfills the requirements of urban agriculture, urban revitalization, sense of community, commerce, greenway connection, and urban setting. The fact that this is a community building project and all the work is being done by volunteers make this a strong case study. Pride in ones work always shows through. The fact that this forest brings together a group of people that have nothing else in common but they live close

to this park, and they volunteer to create this common goal of a food forest is the desired effect I want with my site. This builds the sense of community and people want to be included. I want people to want to volunteer and create this utopia in the city center that they have pride in. This food forest is within the Jefferson Park that is in the city of Seattle, which classifies this project as an urban agricultural installation. It revitalizes a park that was not being used to its fullest potential. The Beacon Food Forest is a greenway connection within the famous Seattle park system. It also transitions people from housing and apartment district to a park setting. Currently the aspect of commerce with the food forest is still in development. As of right now it's a first come first serve basis that is free and open to the public. (Beacon Food Forest, 2013) The volunteers at the food forest are making their community have free organic food. The use of an urban green space for production is a way to make an area have more than just one purpose. Whether it is for producing food or a revitalized park for the public urban agriculture has benefits for people to enjoy. The fact people did not use this site much prior to the installment makes this urban agriculture project a success.

Literary Review:

Research Points: 11: Therapy Gardens, 7: Accessibility, 4: Broken Community

According to Eugene A Rothert Jr, author of *Horticultural Therapy for Nursing Homes Senior Centers Retirement Living*, "Gardening is good therapy for young and old. The Earth has great healing power" (Rothert, 1981). People of all ages may at some point of their life, go through therapy in some way, shape or form. This could be for medical use, or for a strength exercise. The use of therapy gardens has proven very effective with the elderly in retirement homes (Rothert, 1981). Rothert further explains that "Research conducted at Kansas State University, Manhattan, Kansas, has shown that involvement in therapeutic horticulture programs maintained or improved the life-satisfaction of nursing homes residents." (Rothert, 1981) There are also specialized programs that can be made for an individual health care needs, whether it is from arthritis, cardiac problems, to muscular dystrophy (Rothert, 1981).

Programmatic events for the elderly will provide a strong connection to the assisted living and retirement home and helps to get the proper therapy for the residents living there. It is a way for them to get out of the building and get some exercise that is fun. There can also be programs set up with area elementary school to pair up the elderly with kids to make this more interactive.

The book also informs about the accessibility of a garden site. When addressing the elderly in retirement homes, many residents have mobility concerns with wheelchairs, walkers, and canes. When looking at the planter beds, "Keep container heights within a 20-28 inch range. Containers should be no more than 4 feet in diameter or width to accommodate the average reach of 2 feet from a seated position" (Rothert, 1981). This will be a design standard in my site to make sure there are accommodations for people with mobility concerns.

The installation of the urban agriculture can also help with the community development. This can help with both young kids and to the elderly. As stated in Rothert's book, "One 83-year-old man noted, "I finally have something to do. I was a gardener all my life but living here I had no way to garden. Since

the program started I feel like a man again...Now I have something to look forward to when I get up each day" (1981). This quote shows the feeling that I want to provide the residents, a sense of community pride in their own garden. Programs base on involving the elderly with the youth of the area can strengthen the community even further through actions of pen pals or days where kids and seniors pair up and plant the gardens. These programs build community involvement and bring people together that would have no other connection.

Chapter Two: Methodology

Methodology:

There are many topics within this thesis that need to be explored. Going through the design process, more information will is required. These topics that follow are covered more in depth throughout this thesis.

1: Climate-go through national weather service and government websites

2: Plants- local nursery and farms websites and personal interviews

3: demographics- go through the national census service and map with GIS

4: Site area and surroundings- use Google Earth and personal inventory

5: Culture- personal inventory and government websites

6: Water sources- almanacs and national weather services

7: Design practices and Standards- personal inventory and books in library

8: ADA codes- ADA website and books in the library

9: Building codes- city of Fountain Hills website

The climate of the site is important for the growing of the agricultural plants. This information is accessible through the national weather service and other government websites that have detailed list of the rain fall and the average temperatures throughout the year. Knowing what plants can be grown in the area is a must. Talking to nurseries, farmers and landscape professional provides the knowledge of native plants and the food crops that are grown within the southwest. Knowing the demographics and site surroundings will connect the development to the community and with the community's culture. With the culture of the site, making sure that the Fountain Hills Art walk is connected through the site. Also using Native American forms to further tie the culture to the site brings another layer of connection to the culture of the site. The information will be collected through the US census data and complied within the program of Arc map with GIS. Arc map will also provide a tool to compile water shed information on how the site has access to water. The Fountain Hills official city website provides the current building codes, design practices and the current ADA codes.

Site Introduction:

Based on the criteria and research, the site that is quite suitable is in the downtown district of Fountain Hills, AZ. Fountain Hills is the northeast suburb of Phoenix, AZ.

This image from Google Earth shows the greater Phoenix area with the suburbs surrounding the main city. Fountain Hills is indicated by the red star in the upper right hand corner this image. Within this image, it shows the surrounding context of mountains and desert surrounding Phoenix.

History:

Fountain Hills was founded on December 15, 1970. The McCulloch Properties Inc, a subsidiary of McCulloch Oil Co, acquired the 12,000 acre P-Bar Ranch. McCulloch Properties was the main company who started the development with C. V. Wood Jr as the main designer. To help sell the lots, McCulloch implemented the "Fly to See" tactic. This tactic is when the company would fly people in the company's private fleet of planes to help sell the properties. The first residents moved into Fountain Hills in February of 1972. With the continuation of slow growth, the community was formed December 5, 1989 with its first election of city legislation (McThrall, 2013).

The name Fountain Hills comes from the fountain that was built in the center of the town which would be a promotional attribute to draw people to buy property there. The idea for the fountain came from the designer and community developer C.V. Wood Jr. C.V. Wood Jr. wanted this fountain to be one of the tallest in the world to help attract even more property owners. This fountain is located within what is now

Fountain Park, which is a 64 acre park. The fountain operates daily from 9 am to 9 pm on the hour for 15 minutes. The current daily height of the water fountain is 330 feet with the max height of 560 feet when all three water pumps are in action (McThrall, 2013).

In 2010 the population of Fountain Hills was 22,489. The average age is 53.9, while the average age for Phoenix is 31.1. This means that any design will have to be geared to an aged demographic. The housing is primarily single family housing, but Fountain Hills also has a mixture of multi-family living, commercial and industrial lots. Fountain Hills has an international flare with the declaration of having three sister cities of Kasterlee, Belgium, Dierdorf, Germany, and Ataco, El Salvador. Whether it is one of the world's largest fountain or its international sister cities, Fountain Hills has many things that makes the city very unique (McThrall, 2013).

The center of Fountain Hills is based around Fountain Park. The main downtown district is a greenway walkway down the Avenue of the Fountains which starts at Fountain Park. This avenue is composed of a shopping center and lined with many small fountains. On one side of the avenue is a highly developed strip mall and the other side is a desert that is not developed. There is a huge disconnect from the rest of downtown Fountain Hills. Additionally there are approximately 15 acres of undeveloped land directly in the center of Fountain Hills that is prime real estate to be utilized.

This image from Google Earth is at the site scale. It shows the connection to Fountain Park with Fountain Lake at the right hand side of the image. It shows the roughly 15 acre site that I have chosen that is outlined in the red line. The Avenue of the Fountain is right above my site that is the border of the site that connects it to some local commerce.

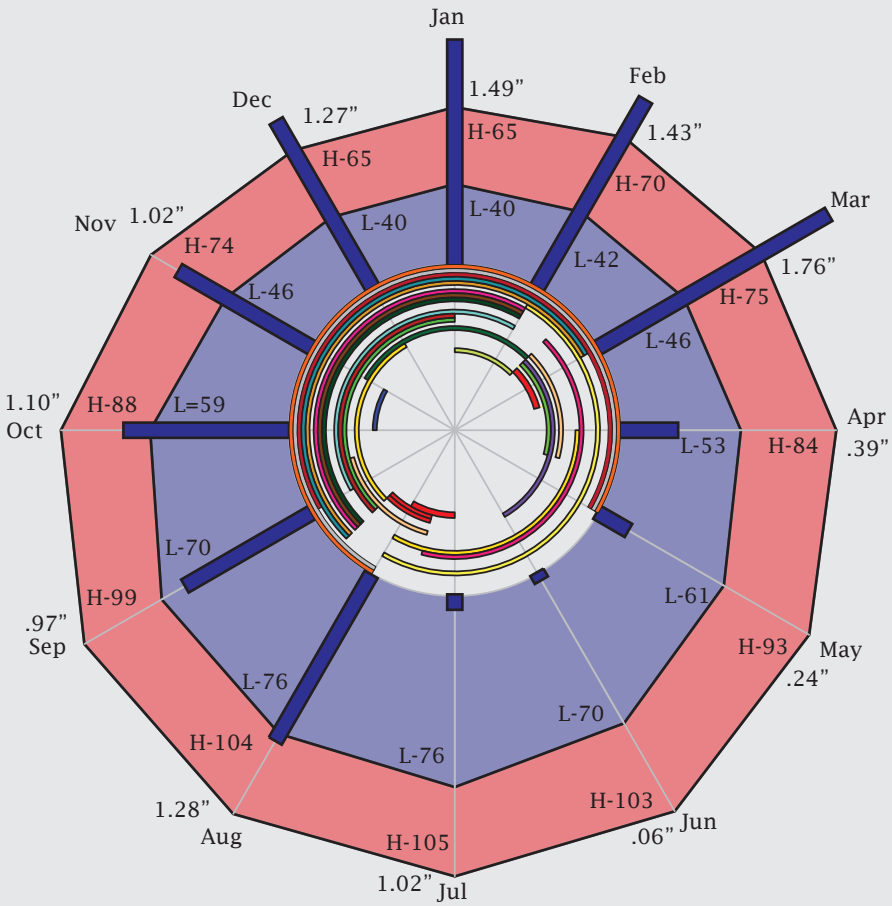
This site I have chosen fulfills the requirements of an urban downtown, an area between 10 to 50 acres, connected to park, connected to commerce, connected to retirement and assistant living, and is in the region of the southwest. It is a part of a community that is more than 10,000 people to make sure that there is a population to support my design (McThrall, 2013). It is in the heart of Fountain Hills in the center between the main commerce district, the community center and museum, Fountain Park, and a retirement facility. This site is along Avenue of the Fountains that can be transformed into an urban greenway connection for visitors and residents to enjoy. The site has very little elevation change, as well as very heavily compacted soil which are two challenges I will need to design around. The main challenge I address with this site is water management. Being that it is a desert, water is in short supply and I will have to design unique ways to save any water that is on the site.

This design will have to accommodate all ages of people for this site. From youth educational and learning gardens, to advance master gardens and therapy gardens, urban agriculture can provide all these topics to the public. The intention of urban agriculture is to provide a community link and common gathering area for both visitors and residents. The day to day foot traffic may only be in the light hundreds of people, but some of the programmatic events will draw a much bigger crowd into the thousands. The clientele will be the city of Fountain Hills residents mainly with the expectation that visitors will be coming to the site. The commerce will also draw people to the site but will be accepted that they will not stay for the entire day.

Each age group has different design

features within the site. For the youth from the ages 3-16, easy to read signage, educational activities, and site specific details at the proper scale will accommodate for learning opportunities as well as bringing families together. For the adults ages 16-50 demographic, keeping plots at a manageable size and having proper programs and lectures to keep their education growing as well as to make areas that they as visitors or volunteers will like to stay at will make this design a success. When it comes to the elderly from ages 50 and up, making the site accessible is a concern. There are many sustainable practices that do not condone accessibility. But keeping this in mind, I will be making areas that are specifically designed for therapy and make them handicap accessible for wheelchairs, walkers, and canes. Using different designed planter beds to be at wheelchair height, youth height, or on the ground will make this user friendly for all skill types and mobility restrictions. There are some areas that will need to have all age groups in mind like gathering areas, seating areas, and walking areas.

Chapter Three: Results, Site Inventory, and Programming



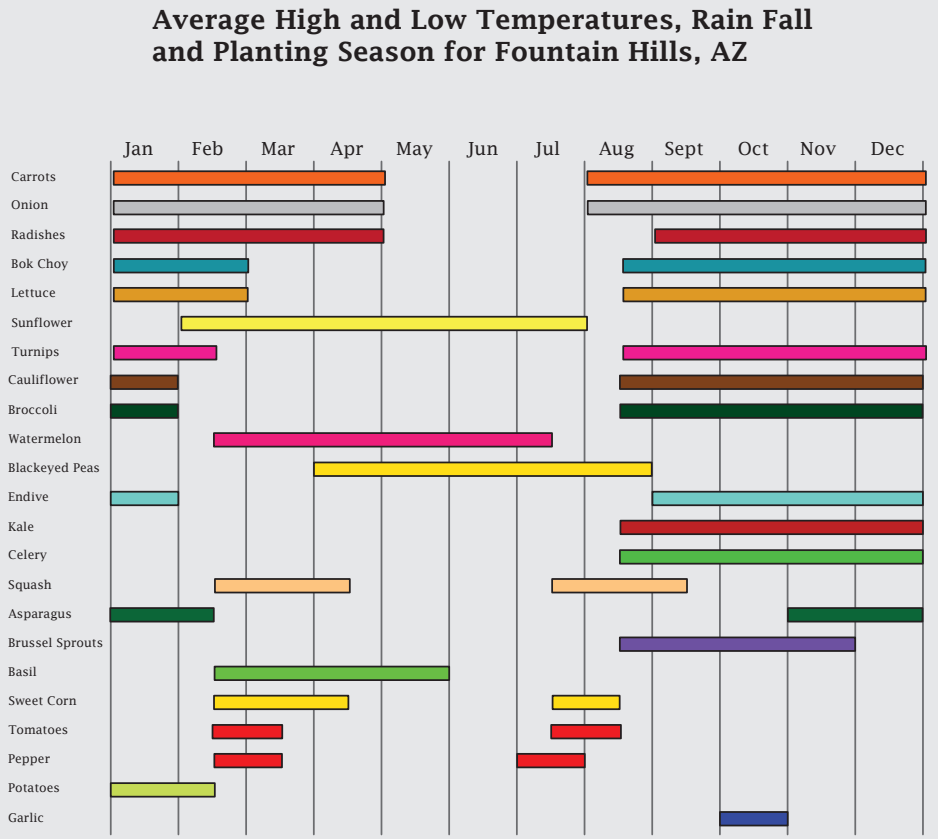


Image from the Avenue of the Fountains looking toward the site.

Site Inventory:

More Images of Site Inventory within Appendix

Place: Fountain Hills, AZ

Size: 15 acres

Population: 22,489 in 2010

Founded: December 15th 1970

History:

The site is currently an undeveloped section of downtown Fountain Hills. It has not been developed since the town was founded back in 1972 (McThrall, 2013). Before the city was founded the land was occupied by the Native Americans (McThrall, 2013). "The "early-day" history dates back centuries when the area was home to between 4,000 and 10,000 Hohokam. Although the tribe later disappeared, remnants of its canals, pottery and other artifacts show it was a thriving civilization" (McThrall, 2013).

The site is zoned as part of the city's Town Center Commercial Zoning District (Fountain Hills city website). This district is for the development of commercial and public use. It can include green space, buildings that are multiple use, and single use buildings.

Site Functions:

The current function and use of this site is non-existent. It is an area that has been untouched since the initial grading of the city's infrastructure. The Avenue of the Fountain on the north side of the site is used much more frequently used than the actual site. The Avenue of the Fountains is the main downtown street that connects to Fountain Park. This strip has stores, bars, gyms, offices, and restaurants. The sidewalks and walkways are more developed and decorated

with themed elements. Currently there are events that happen within Fountain Park like movies in the park, 4th of July celebrations, and Arts in the Park. (Fountain Hill city website).

grow wildly all around the Phoenix area. The site also has many rocks and boulders littered all around. These rocks could be saved and incorporated within the design of the site.

center of the boulevard surrounded by some small shrubs and fountains. This is the start of a pedestrian walkway but it very incomplete and is a possible developable area.

Image of what the site looks like from the northwest corner of the site.

Image of orange trees on the site

<u>Plant material:</u>

The site is sparsely covered by volunteer plants that spread throughout the whole site. There are no formal plantings within this site context being that it is an undeveloped lot. Most of the plants are desert grasses and shrubs that

On the Avenue of the Fountains, there are drought resistant plants. Orange trees, various Lantanas, Red Bird of Paradise, Palms and cactus, among other plants line the street and create a welcoming area for people to walk along the avenue. There are large trees lining the

When talking about urban agriculture, knowing what other farmers are growing already in the area shows the possibilities for this site. Schnepf Farms in Queen Creek, Arizona, is classified as a U-Pick farm (Schnepf Farms online). This

is where a customer comes to the farm and pays by the pound for the amount of produce they have choose to pick (Schnepf Farms online). The farm produces many different kinds of produce. Here is the current list of produce that Schnepf Farms have or will have available later this year according to their website and weather permitting:

Winter Squash	Spaghetti Squash
Acorn Squash	Lettuces (Romaine, Leaf, and Butter)
Celery	Broccoli
Cauliflower	Cabbage
Black Eyed Peas	Kale
Radishes	Carrots
Beets	Turnips
Sugar Snap Peas	Zucchini
Yellow Squash	Tomatoes
Cucumbers	Potatoes
Sweet Onions	Pickling Cucumbers
Melons	Artichokes
Garlic	Green Beans
Okra	Red Leaf Lettuce
Endive Lettuce	Swiss Chard
Collar Greens	Apricots
Peaches	Plums
Apples	Pumpkins
Sweet Corn	

One aspect of urban agriculture that the research leads toward was the use of permaculture. As Bill Mollison's book *Permaculture A Practical Guide for a Sustainable Future* defines "Permaculture (permanent agriculture) is the conscious design and maintenance of agriculturally productive ecosystems which have the diversity, stability, and resilience of natural ecosystems" (Mollison, 1990). This is a unique way of designing an agricultural plot. This is a method of trying to make agriculture work with as little human interaction with the plants that is possible (Mollison 1990). This means that there are self watering systems, natural weed prevention, low maintenance structures, and nutrient replacement practices. Permaculture can drastically reduce the amount of water that can be required for the plants by how one arranges the plants and by how you group different plants together (Mollison, 1990). As one of the main points Mollison makes within this book, permaculture tries to work with nature and use the natural processes to benefit both the plants and the gardener (Mollison, 1990).

Natural Processes:

The climate is classified as a desert. As the definition of desert states " arid land with usually sparse vegetation; *especially* such land having a very warm climate and receiving less than 25 centimeters (10 inches) of sporadic rainfall annually" (Merriam-Webster Online). The average rainfall for the Fountain Hills area is 11.97 inches of water (McThrall, 2013). This amount of water is not suitable for growing plants that produce food. Most production plants on average require 1 to 2 inches of rain per week. Depending on the plant, different amounts of water is required for the plant to grow properly and produce

food. Irrigation will have to be done in order to allow the plants to grow. Placement of the plants will be crucial grouping plants that require more water together and grouping the more drought resistant plant together will help the control of the irrigation to conserve as much water as the site can. Implementing a catch basin system for when the site does get rain is another idea to help conserve water on the site by connecting it with the irrigation system. By using making sure that the collection area is at least 5 times the amount of planted area, store the water on site, the site can theoretically be 100 percent off the grid for water consumption. Being that the weather is unpredictable a secondary back-up system will be installed to make sure proper watering happens.

The main water source for Fountain Hills is the Central Arizona Project (Fountain Hill city website). The Central Arizona Project is a canal that is 336 miles long and flows from Lake Havasu to Tucson (Central Arizona Project online). This is the main water supplier for the Phoenix area. The water table around the Phoenix area is on average approximately 400 feet below the surface (Arizona Department of Water online). Drilling a well to supply the design with water is a possibility but will be an expensive installation.

The site has no major trees and or shade producing buildings. This is a problem because of the intense heat that can be produced on a summer day. The average temperature during the month of July is 105 degrees Fahrenheit (McThrall, 2013). Creating shade will help conserve as much water as possible as well as keep the visitors comfortable and out of the sun. As the official website states Fountain Hills is in the “Valley of the Sun” (Fountain Hills online). So clearly there is not a shortage of the sun. To

connect these shade structure to the art garden, the shapes will be based on the native Hohokam Tribe.

One natural event to be aware of is the haboob. A haboob is "a violent dust storm or sandstorm" (Merriam-Webster Online). Most haboobs are not dangerous to the public but can be hard on plants by depositing dust and sand on to the plant. This can affect the plants growth cycle by restricting the photosynthesis process. There is not much that a designer can do with this naturally occurring event; it is just an event that should not be forgotten when dealing with the desert area.

Site context:

The two major roads that border the site are the Avenue of the Fountains and Saguaro Boulevard. Saguaro Boulevard is a major road within Fountain Hills. It is the most easterly of the three major roads that lead in and out of Fountain Hills. The other two major roads are Fountain Hills Boulevard and Palisades Boulevard.

Saguaro Boulevard's average traffic count in 2010 was 16,716 vehicles a day while Avenue of the Fountains average 3,743 (Google Earth Pro, 2013). Both have a considerable amount of traffic but Saguaro has six times the amount of traffic than the Avenue of the Fountains. This shows that that crossing Saguaro is a concern that will have to be under consideration when connecting the site to Fountain Park.

Image showing the intersection between the Avenue of the Fountains and Saguaro Boulevard.

There are many area businesses that are on Avenue of the Fountains and surrounding the site from real estate offices, restaurants, insurance

offices and hair salons. The businesses that have a direct correlation to the site are as follows:

Brokers Alliance
All American Sports Grill
Anderson Group Real Estate
Fountain Hills Design Center
The Artists Gallery
Newer Nails Saloon
Shear Point Hair
Curves Gym
Sofrita
Gridley's of Fountain Hills
Sonoran Lifestyle Real Estate
VIP Travel Consultants
Homes and Pools
Rafaela Costume Décor
Cindy and Danny's Nails
Chase Bank
Nonny's Flower and Event
Chen's Garden
Remax Sun Properties
American Family Insurance
The Forum
Washington Federal Bank
Maricopa Sheriff
Community Center
Fountain Hills Museum
Fountain Hills Post office
Fountain View Village
Town Center Crossing
Village at Towne Center
Holiday Inn

Image of the stores and restaurants on the Avenue of the Fountains

These businesses bring a wide demographic into the downtown area of Fountain Hills. The park is a draw for people of all ages both young and old to come and enjoy the outdoors. Using the water park on a hot sunny day, playing 18 holes frisbee golf, or just taking a leisurely walk around the park are just some of the common uses for Fountain Park. The strip mall does the same thing. This mall on the Avenue of the Fountains incorporates businesses that attract a wide variety of people. There is a strong connection with the retirement and assistant living homes that are in the area. There are three facilities directly adjacent to the site. This is where the opportunity of a therapy garden is present. The demographics with this site are the visitors and residents from the age of 2 and up.

Looking outside the community at the urban agricultural aspect of the project, there are two examples that Fountain Hills can look at as examples and see that urban agriculture is possible in their community and that the context is not too farfetched. Schnepf Farms in Queen Creek, AZ and Agritopia in Gilbert, AZ show that the new green movement is in Phoenix and urban agriculture is becoming more and more popular there. Schnepf Farms

in Queen Creek (another suburb of Phoenix) is an example of urban agriculture in the Southwest and has been there for over 70 years (Schnepf Farms online). This is a "U-Pick" farm where they grow the fruits and vegetables that you as a visitor go and pick them yourself and pay by the pound (Schnepf Farms online).

The city host many different festivals including Peach Blossom Celebration, Pumpkin and Chili, and Country Holidays on the Farm (Schnepf Farms online). On top of them having the farm, there are activities that visitors can do. There is a petting zoo, some small carnival rides, a tour of the farm in a miniature train, and hay rides that are pulled by antique tractor. If picking the fruits and vegetables are not something a visitor enjoys, there is the general store and bakery. It houses products that can be bought such as salsas, pickled vegetables, pies, cookies, jams, jellies, and baking and cooking supplies (Schnepf Farms online).

Agritopia in Gilbert, AZ (another suburb of Phoenix) shows that a community can be based on urban agriculture. This is a new development focused around preserving urban agriculture within a community. The Johnston family owned the land and wanted to keep their farming heritage alive through a community (Agritopia online). In doing so the community is founded upon a centralized urban farm that the whole community can participate and reap the benefits of agriculture. Anyone within the community can volunteer to work in the gardens but there is a full time staff to make sure the daily maintenance and daily work gets done (Agritopia online). There are also many community gardens plots for those residents that are ambitious enough to grow their own plants. The development of a new orchard will bring a greater variety of produce.

The benefit of a community member is the interaction with the other residents in the community and the produce is then sold at the farmers market (that is open to everyone from in and outside the community) with the money raised helping pay for community projects (Agritopia online). This promotes a strong sense of community because of the joint goal of making a successful garden and the community a better place to live. Besides the garden, the community has placed many building codes such as no private pools, low lying fences, and your house must have a front porch to better develop more community involvement with each other (Agritopia Community Website, 2012). The basis of this development is to promote the community involvement in all aspect of life.

Image of the mountain views from the site

Views:

Fountain Hills is famous for its many view sheds that can be seen all around the city (Fountain Hills online). There are the Superstition, Scottsdale and McDowell Mountain ranges that encompass the city (Fountain Hills online). While visiting there, it seemed that every day the mountains looked different. Some days the mountains looked closer to the city while other days they looked to be miles away. The skyline views of these mountains are breath taking when the sun hits them in the early morning or at dusk.

The site particularly has picturesque views of Fountain Park. When the Fountain within Fountain Park is running the views are very beautiful with the fountain in the fore ground and the mountains as the background. Evoking a sense of pride, the main fountain in Fountain Park connects the community together. The residents all take pride in having one of the world's biggest fountains in their back yard.

Image of the Site looking toward Fountain Park

Materials:

The Adobe and Spanish building styles are the main styles present in Fountain Hills. This combination of styles brings a unique sense of place. The stucco building facades with the tiled roof and curved exterior walls are examples of these two styles coming together. Most houses area also only one story tall, being that two story houses are much harder to cool in the summer. Some buildings have flat roofs and wooden poles that blend the Adobe construction with the Spanish style house.

The main material that is present on the site is the poured concrete sidewalks. These sidewalks are unusual for the city of Fountain hills because they are in straight lines. Most of the sidewalks around the city are not in straight lines but weave back and forth to make the walk a more pleasurable experience. There are some rocks that are on the site and could be used within a design for planters or decorations.

Image of Avenue of the Fountain boulevard with walking path

The Avenue of the Fountains has more materials that could be incorporated within the site to tie it with the surrounding area. The concrete sidewalks have an inlay of a red concrete in a weaving pattern to symbolize the other sidewalks and helps tie the straight sidewalk with the weaving sidewalks. The use of different paving patterns makes some of the gathering areas more distinguishable from the walking paths. On the boulevard, compacted gravel serves as the walking surface. This is a technique that I would like to incorporate into the design because this is a permeable surface and can help with the storm water runoff on this site.

The use of shade structures with the Avenue of the Fountain is present through pergolas. The unique aspect of these pergolas is how they are constructed. The use of a rebar mesh in a column shaped filled with rocks from the area serve as the main support structures that hold up the roof of the pergola. Most of the walking paths are in full sun on the Avenue of the Fountains.

The use of wrought iron is also present with the details of railing and around windows on the buildings. This can be an element that can be carried out throughout the site in many different applications. It could be used for the structural elements such as a gate, or as a decorated item to better tie in with the Spanish influence architecture.

Detail images showing shade structure and details

Findings of research:

1: What are Productive Landscapes/Urban Agriculture?

The research has provided a definition for productive landscapes and for urban agriculture.. Productive Landscapes and Urban Agriculture are simply landscapes that produce food for human consumption. They can be a part of the city, or on the small scale of a residential site. With any landscape, the more time you have to put work, maintain, and cultivate the more rewards one will receive from the site.

2: How do you do Urban Revitalization and mend a broken community/center?

Urban revitalization can come in many different forms. In the case of Lafayette Greens in downtown Detroit, Michigan urban revitalization came in the form of urban agriculture. The time and money spent on that particular site is being used to its fullest. This site made the public interested in coming to the site and spending time there. When people are drawn to a site and spend time there, they form a connection with that site. It is this connection that really revitalizes an area of town. When people have that connection, they are more willing to support the programs and activities that are held there.

3: What is an Urban Setting?

An urban setting is simply an area within a city. For this thesis the parameters of the city needed to be at least 10,000 people. The urban areas that also qualify are an abandoned lot or lots within a residential community, a rundown park within a city, or like this project an undeveloped lot in a downtown setting. All are classified as urban settings, and all could have been used if this was the only driving parameter for this project.

4: What are the Accessibility Requirements for the Public?

When addressing the elderly, accessibility comes into question. There are certain ADA requirements that will need to be followed while developing a site plan. Keeping in mind from what I learned from the book *Horticultural Therapy for Senior Centers Nursing Homes Retirement Living*, making sure that the site walkways are up to code as well as taking the consideration of raised planters for people in wheelchairs, walkers or have limited mobility will make this site more successful. Moving into the design stage of the project, there is more research to be conducted for the specific specifications of these surfaces, ramps, and other mobility aids.

5: How to Establish Greenway Connections?

As described earlier, a greenway is a corridor that is for recreational use or preserves nature. Within Fountain Hills, Arizona, the start of a greenway has been established with the Avenue of the Fountains. It is a start but needs help. Further development toward drawing people to the greenway is needed. Establishing the connection between a park and another outdoor venue is a way to draw people down the corridor. Further connecting paths that are within a walkable distance creates this draw as well. Designing the greenway as a comfortable space and a place people feel safe will encourage people to enjoy their experience. Not all greenways need to be an active space, some may function as a passive space. For this thesis, the use of an active space is the focus.

6: Can an Elderly Therapy Garden be encompassed in Urban Agriculture?

Elderly Therapy gardens can take the shape of many forms. Urban Agriculture can be used to help out the elderly with their therapy needs. Lifting, moving, digging,

pulling are all different ways that gardening can help with mobility. It is a way of disguising exercise in a manner that produces not only dexterity and strength but some fresh fruits and vegetables. Keeping a goal of growing plants is a good motivator for all individuals to get out and move. It is a fun way to get interaction with others and forms a bond with the community with the pride in one's work.

Plans for Proceeding:

With this process, I started with a question of "Is it possible to use Urban Agriculture to mend a broken downtown center and make it a productive landscape that provides food, entertainment, and therapy to residents and visitors?" Once the question was defined, making the parameters of the research further defined where I wanted this project to go. After researching, some of those questions were answered and others were not. This changed how I looked at this project and how I found that there were more important question the others that will drive my design. To continue this thesis, further site inventory and analysis will have to be done. One is never done with collecting data that can further develop a design. The next step is to map the correlation between the different categories within this thesis, see the similarities and draw further conclusion on how to properly design a site that will accomplish the goals that were set forth. Further research in the specification of ADA accessibility will make sure that the site is welcoming to all that want to help volunteer or visit the site.

The tasks that need to be done with continuing this project is to take the information that I have collected and draw conclusions from the data. Those conclusions start with a base design that accomplishes the goals of the project. From there further refinement of the design to make stronger connection with the site, surrounding context, and community. Once the design is in the finishing stages, details of the individual elements are incorporated throughout the site.

Project Goals:

For this thesis, there are eight goals that outline how this project can be successful. Some of the goals can be answered without the project being installed, while others are more theoretical and cannot be predicted. The eight goals are as follows:

1: To create an urban agricultural design that fits within the city of Fountain Hills.

2: With the urban agricultural design, connect with the community and adjacent properties to further develop the downtown corridor.

3: Promote the use of a therapy garden and make it accessible to the retirement and assistant living complexes that are around the site.

4: Use current water saving techniques and make the production of the food economically viable for years to come.

5: Build an area that the community of Fountain Hills can be proud of and promote the city with.

6: Create an area that can stand as a gathering place for social events, community events, and everyday use.

7: To use this design as a learning block for other projects to come that deal with urban agriculture and to promote urban agriculture within more communities throughout the United States.

8: This design should educate the public on how their food is produced, how much work it takes to produce their food, where their food comes from and what it looks like, and the basic knowledge of growing plants.

Chapter Four: Discussion

Discussion:

Throughout this thesis numerous topics within the landscape architecture field are open to discussion. Each topic has opportunities and challenges that go with them. Some of the research did not go as planned. But through all of it, understanding how each of the research questions affect the overall design will provide a more complete project in the end.

Urban agriculture is an up and coming design practice in the landscape architecture field. This is something that I feel very passionate about. I grew up in an agricultural community outside of Fargo, North Dakota. Agriculture is in my blood and I love it. Not everyone feels the same way that I do, but growing productive landscapes is becoming more and more popular. Looking at Seattle, Washington and its extensive parks system, or the pocket parks of New York, New York, one sees how the times have changed and how the landscapes have changed with them. What the future holds, I do not know. But I do believe that urban agriculture is the next design standard that is coming about. David Tracey stated it best “The city of the future is green and delicious” (p.1). Being that there are many aging cities in America, urban revitalization is an up and coming aspect of design. This may not be on a large scale within a city but it is happening, like in Detroit, Michigan with the site of Lafayette Greens. Small improvements can make a big difference within the context of that site. It might be a catalyst for more green spaces or urban agricultural spaces to form within that city. Now take Fargo, North Dakota for an example. The downtown district, called the Renaissance district, was in decay. Within the past 10 years the district has slowly been transforming into an urban center that people can enjoy. For many years of my life, I never knew

what was even downtown. Now that the community has come together and made up-dates to the buildings, added restaurants and establishments, and created a walking friendly area I visit downtown almost every day. Even if it is not within a large city, urban revitalization is going to be needed within most cities in the near future to keep them up to date with current urban trends.

One topic that was not covered within the research of this thesis was how to combat the "Snowbird Syndrome". While researching, there was little data that could prove or disprove this event going on. Doing personal interviews of business owners did help with the understanding of the struggles that business's have, but I could not draw clear conclusions from that. Most of the research was just based on the influx of population but not how that directly correlated with the economic turns of the southern states. With that information it changed some of the original thoughts on how this project would function. The "Snowbird Syndrome "did not have as big as an effect that was originally predicted. Using the learned information the site is designed for year round use. This derived how big the population I deemed the city would have to be to make it successful.

The topic of the elderly therapy gardens was a topic that was thought out but not sure how it could function or if it was even possible. Having doubts, the research that was conducted proved how beneficial the gardens can be to not only the elderly, but to the overall community. The book *Horticultural Therapy for Senior Centers Nursing Homes Retirement Living*, had many cases showing how not only the residents get the benefits of the garden, but the communities all pitched in and made sure that the garden flourished. After reviewing

the research, I look at retirement and assistant living homes in a different manner and think how a simple a garden can change the outlook of its residents and surrounding community.

Accessibility is a concern with any site, especially when addressing with the elderly. Materials that young adults may think are easy to walk on, such as gravel, may not be for the elderly. This is a design challenge that will have to be carefully considered when addressign with walking surfaces. I do not want to have poured, impervious concrete all around the site for the ease of walking but a variety of surfaces to help define the different spaces.

With people who have limited mobility, gardening can be a struggle. One simply cannot lift the ground up to working height. Through the research that has been conducted, having raised planters, pots, and grown planters appeal to people with all mobility ranges. Understanding how the different type of gardening through these means plays a huge role on what structures and the overall layout of a design. Having raised planters with enough of a ledge for people to sit on not only makes the elements multifunctional but can help the volunteer in planting, maintaining, and harvesting the garden.

The chosen site is in the Arizona desert, water is a huge challenge. In the research that was conducted, it was a much more complicated situation than was originally thought. People have been growing food in the southwest for thousands of years, but understanding the common practice is a whole different situation. The book *Permaculture* has many different design ideas that help with the conservation of water (Mollison, 1990). From using different methods of irrigation, the grouping of different plants, to using mulch within the garden to control weeds and help prevent evaporation

(Mollison, 1990). Permaculture is also to promote the use of the natural system. An example of this is planting tight groupings of plants together that help prevent the growth of weeds but then removing some of the plants to allow full maturity. Permaculture could become a major part of the site, especially when addressing with water conservation.

How does a site mend a broken community and bring pride toward that community? With the case studies and research that was conducted, one thing stood out. When people have a connection to a site, even just a small one, they are proud to call it their own. Once people call the site their own, investing money, time, or committing to projects come much easier. Also having a common goal within the design helps the community connect with the site. With urban agriculture the common goal is to produce some food for people to consume. Once a person has volunteered, put their time forward, they have the sense of pride that "I did that! I helped with that! I am proud of that!" It is very similar when a child creates something for their parents. The parents are proud of the product because it is something their child did, and the child is proud because of the product. That feeling, that sense of pride is how an urban agricultural design can bring people together and promote the community.

After the pride and community is brought back together, commerce will increase. Within the book *The Contributions of Historic Preservation to Urban Revitalization*, the four cities of Alexandria Virginia, Galveston Texas, Savannah Georgia, and Seattle Washington all saw huge economic growth after the city was revitalized and brought into a new design (Booz, 1979). Some of the projects were focused on homeownership, while others based on tourism (Booz, 1979). While these urban areas did not use agriculture to

revitalize the run downed districts, it a new tool that urban designers, landscape architects, and city planners have in their arsenal to bring people back into the center of the town to participate in programs, shop, or invest with homeownership.

Chapter Five: Site Information

Site Information and How Research Applies:

Throughout this thesis there have been many research questions, topics, and new ideas that apply to urban agriculture and the site context. But how do these relate to the design of the site chosen in Fountain Hills, Arizona? This site information will apply the concepts on the site specific scale answers the questions that are reoccurring within this document.

Is urban agriculture a viable way of using this land in the city of Fountain Hills? As the research has shown there are other sites that are around the greater Phoenix area that produce food for people to consume and have been producing for a long enough time to prove it can be done. Urban agriculture can happen even within the Arizona desert. Urban agriculture can breathe new life into a disconnected community and supply numerous areas for actives as well as community events. The program could develop to have guest lectures being held within a gathering area and make presentations on how to grow these plants within the residents own backyards. Using urban agriculture to teach how the food is grown will be another aspect of this site. The use of labeling of the different plants through the different stages of a plants life will educate the public. This gathering area can be used for more than just for presentations. It can be the area that people can enjoy their morning coffee, meet friends to go for a meal at a local restaurant, or just relax and enjoy the outdoors. Some individuals may stay for a couple hours while others may stay for only a couple minutes. The site will have to have seating and tables so visitors can relax and enjoy the space. To make sure that the visitors are protected from the sun, being that the city is in the “Valley of the Sun”, having shade canopies will provide the necessary comfort

out of the direct sun light. They could take the form of a pergola or the use of canvas sails or umbrellas.

Having people gather at the site will form a connection with that individual. When individuals have the same connection there becomes a sense of pride for a site. Some people will volunteer at the gardens and have a strong connection and pride with the garden. Others might just simply enjoy walking through, seeing the different plants, and enjoy the surroundings of the site. These visitors will have a connection that shows an appreciation for the site and pride in what their community is doing. Some visitors will have a minimal connection because of the small amounts of time they spend there. Using the site as a meeting place, "Let 's meet by the gardens. I meet you at the Fountain Farms sign." might be the only connection some people have. But even the smallest connection can have a big impact. It only takes a little bit before someone could get invested within the site just because they had one encounter.

While people are visiting this site they also are being drawn to the downtown district of Fountain Hills. When there are more people being draw past stores, the likely people will stop and purchase an item. This is how commerce can be increased through the use of the visitors drawn toward the site. The design of the site should connect the two major strip malls together in some form. This could be the use of a walking path or maybe even a building that will help span the gap between the two malls. Providing a safe crossing of Saguaro Boulevard will have to be incorporated within the design. How do you keep pedestrians safe and make sure that the traffic keeps flowing? This is a challenge that the site proposes.

Keeping with the city connections, making the strong connection to the retirement and assistant living

homes is a goal set forth. This will also be a challenge to make sure that the site itself is accessible to people with limited mobility. Designing the planters to accommodate people who use wheelchairs, canes, or walkers will help. Making sure there is enough of a ledge on the raised planters for people to sit and work in the garden so people do not have to bend over will make the site more comfortable. Not all of the areas will be easy to navigate. Some of the permaculture influenced design will not meet ADA accessibility. But making most of the site easy to navigate will be a challenge. Using different materials for walking paths will help define different areas of the site. Some paths might be poured concrete, others just a crushed gravel or rock path. Keeping the notion of trying to keep any rainfall on the site will drive how the materials will be used.

The site is vertically challenged; there is not much slope or topography change throughout the site. It is a flat barren landscape with a small berm of excess gravel that was just dumped on the site. In keeping with the use of different permaculture techniques, the site will have to be sloped in such a way to hold water on the site to use to irrigate the plants. How to properly design an entire site to do so and how to store any excess water will be further researched with the continuation of the project. Maybe that is just one way to combat the water situation. A well could be drilled on site, but this would be costly because of how deep the well would have to be to make sure there is an adequate source of water. Another idea would be the treatment and use of gray water from either the surrounding buildings or possibly the pond in Fountain Park. These could be a possibility that would help with the water situation.

Another challenge with this design is how to make sure this site

functions as an urban agricultural site but is also an active greenway connection to Fountain Park. As discussed earlier there needs to be a safe crossing for pedestrians to get from Fountain Park to Fountain Farms. This can be the start of a greenway corridor down Avenue of the Fountains. Using what little pathways that are currently installed can be the base of how the corridor will look. Further design and connections to the community will strengthen the use of the greenway. Setting a foundation of the greenway to continue down the Avenue of the Fountains will provide there more growth in the downtown area and help with more revitalization.

Chapter Six: Thesis Design

Fountain Plaza and Art Gardens

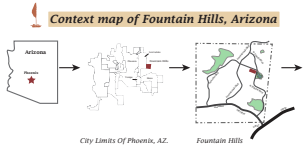
Aaron Hendrickson North Dakota State University LA 572 Design Thesis Primary Advisor : Matthew Kirkwood Secondary Advisor : Dominic Fischer

Urban Revitilization through Urban Agriculture and Art Park

ArcMap, AutoCAD, Sketch-Up, Illustrator, Photoshop, Lumion, Google Earth Pro, Word, DynaSCAPE

Fountain Hills, Arizona

Context map of Fountain Hills, Arizona



Site Information

Site- 15 Acres

Land Type- Undeveloped Desert

Major Roads Surrounding- Ave of the Fountains, and Saguaro Boulevard

Plants- Volunteer Plants, No Formal Plantings on the Site


Evening View of Fountain Park

General Informtion

Population- 23,000

Founded- December 15, 1970

Landsize- 20.32 sq. mi.

Altitude- 1,525 to 3,160 feet above sea level (500 feet over Phoenix)

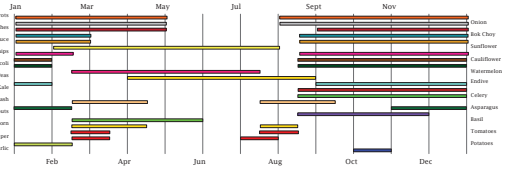
Mountain Ranges surrounding- Scottsdale Mountains, McDowell Mountains, Superstitions Mountains

Intresting Feature- Fountain Park Fountain runs for 15 minutes, every hour from 9 a.m. to 9 p.m.

The fountian shoots an average of 330 ft. with a max height of 550 ft.

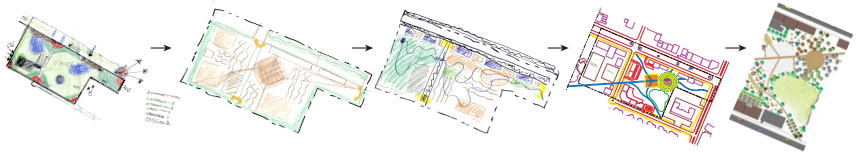

Night View of Fountain Park

Planting Season For Production Plants



Concept Progression

The initial idea for this area started as an urban farm that would bring production agriculture into Fountain Hills, AZ. Developing the concept further, the idea of community gardens and having a large plaza developed into the design of the site with some small businesses surrounding the site. The other concept that came forth was a river system that connected small gardens around a central plaza. Connecting to the existing art walk allows the site to be intergraded into the current surrounding area with the use of an art garden. With further research, connecting to the ancient Hohokam tribe symbols add a layer of art and design that ties Fountain Plaza to the site. The final concept morphs all these main ideas into a small urban agricultural installation within raised planters that are shaped from ancient Hohokam tribe symbols, with a gathering areas and mixed used buildings all around the site. This also has the art walk connection with an art garden and art trail going through the site.



Farm

The original concept was to create an urban farm across the whole site with some gathering spaces and distinguished entrances. This will also create a space for downtown parking and minimal shops.

Plaza

The second phase was to create a larger plaza area with small community garden plots surrounding the central space. A strong design point was to protect the mountain views and the view of Fountain Park.

River and Gardens

Continuing on pushing the design further, the third concept brought the use of a river system that ran through the community gardens. Still, the main concept of using the wheat crop but a farm is present but now there are multiple buildings to create a larger streetscape.

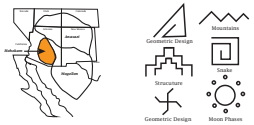
Art and Ancient Symbols

This fourth concept became the strongest. Doing further research of the site, there was a broken art walk that connected to the site. This was also a connecting point half way between the two major installations of art. Also incorporating the use of the ancient Hohokam tribe symbols into the landscape creates another layer of art but makes useable spaces along the whole site.

Urban Agriculture and Art

The final design shows how the plantings would work within the landscape. Having trees in a linear fashion helps create shade for the plants and reduce water consumption, use the hardscapes and buildings to collect as much storm water possible, and have a open green space are all design components. The introduction of an art park and shade structures to further the art concept provides a stronger connection to Fountain Hills and the art walk.

Forms Derived from the Native Hohokam Culture



Production Plants

Asparagus
Basil
Blackeyed Peas
Bok Choy
Broccoli
Brussel Sprouts
Carrots
Cauliflower
Celery/Sweet Corn
Endive
Garlic
Kale
Lettuce
Watermelon
Onion
Pepper
Potatoes
Radishes
Squash
Sunflower
Tomatoes
Turnips

Native Plants

Lemon Tree
Lime Tree
Olive Tree
Peach tree
Pomegranate Tree
Mesquite Tree
Palo Verde Tree
Saguaro Cactus
Aloe Plant
Barrel Cactus
Mexican Fan Palm Tree
Yucca
Agave
Prickly Pear
Screwberry Hedgehog
Organ Pipe Cactus

Rain Water Collection

From the research collected, the average production plant needs 1 to 2 inches of water per week. The average rainfall in Fountain Hills per month is 1 inch. It was decided that the amount of rain water collection for every square foot of plantings to allow enough water for the plant to survive.

By using the water runoff from the hardscapes and buildings, 82,600 sq ft of area was designed to collect water. The planter area amounts to 3,300 sq ft and the orchard area is 3,400 sq ft. There is 6,700 sq ft of planting area. Multiply that number by 5, and you get 33,500 sq ft of collection needed. The design can support and is able to collect extra water and store on site underground and use it at a later time.

82,600 sq ft of Rain Water Collection
3,300 sq ft of Planters
3,400 sq ft of tree line

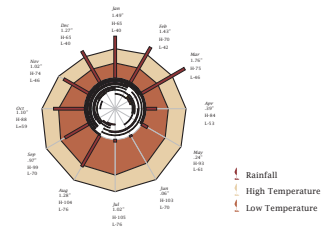
5 sq ft of collection for every 1 sq ft of planters

3,300 sq ft + 3,400 sq ft = 6,700 sq ft

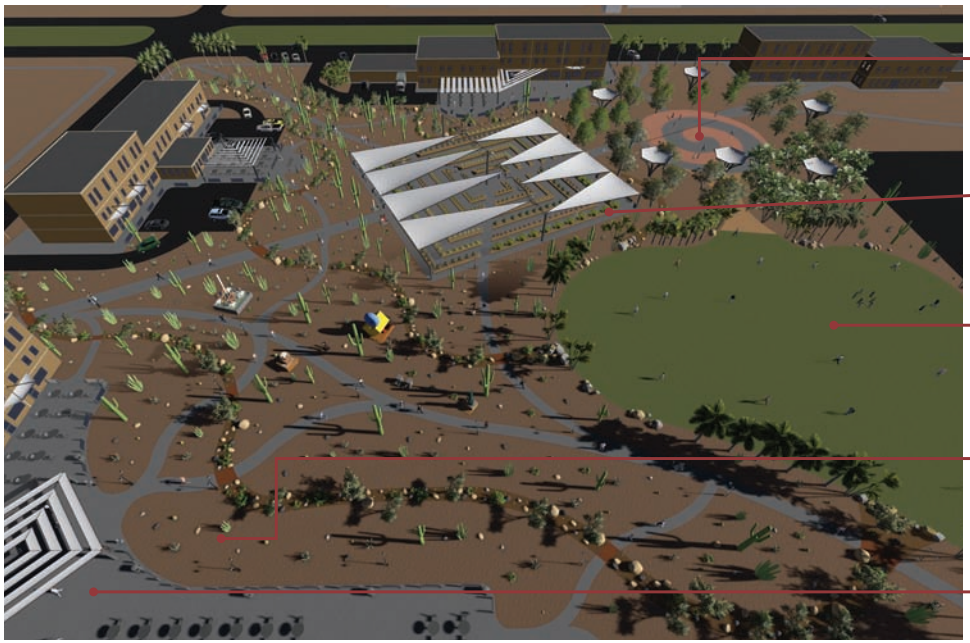
6,700 sq ft x 5 = 33,500 sq ft

33,500 < 82,600

Average High/Low Temeratures and Rainfall for Fountain Hills



Aerial View of Site



Tree Rain Sculptures

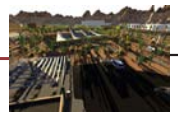
The corn sculpture to the left is an example of ***art installation*** that can collect water to reduce the water consumption needs of the site with the storage of the water on site below ground. There are 6 rain catchers within the orchard area and one catcher will be replaced every year. This will be done through a competition for a redesigning of the catchers.

Urban Planters

The planters to the left are for growing the ***production plants*** that have been chosen for the site. These are made out of ***clay and sand materials***, like the Native Americans did in the past, with thick walls to resist the harsh Arizona heat. The planters are ***handicap accessible*** through the features of their height, width, depth and ease of parking a wheelchair up to them. The ***shade structure*** above will provide some shade and collect rain water to be used to water the plants.

Active Grass Area

The grass area will be used for people to enjoy the outdoors through ***personal activities*** and ***community activities***. The area will also be used as an over flow area for the main patio while community events are going on. People can ***relax*** and enjoy the sun, play sports or other outdoor activities.



Shade Structures

The shade structures will provide ***shade*** for both the visitors of the site and the production plants in the planters. The collection of the rain water will be ***stored underground*** to be used for the plants on the site. These will be ***tensile structures*** made out of metal support structures, cables and ***outdoor fabric***.

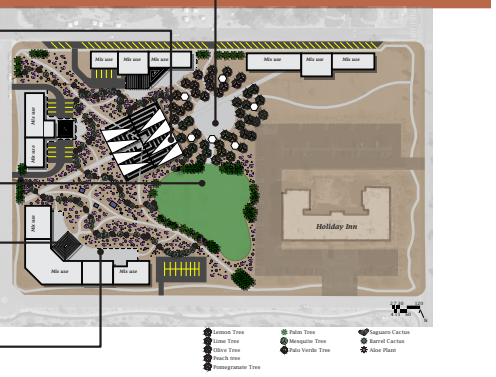
Art Gardens

The perceptive to the left shows the ***art gardens***. This is an area that will have many native specimen ***plants*** to the Arizona landscape, mainly featuring the saguaro cactus. There will be ***modern art pieces*** to further connect the Fountain Hills Art Walk. Some of the pieces will be ***fountains*** to further connect with Fountain Hills.

Program

- Completing the Avenue of the Fountains Streetscape to further promote commerce and draw visitors to Fountain Hills.
- Design an Urban Agriculture installation that generates produce for area businesses and for a local farmers market to start.
- Harvest storm water to be reused as the main source of irrigation for the plants on this site.
- Further develop the existing Fountain Hills Art Walk and introduce new art into the landscape through sculptures, shade structures and plant specimens.
- Create a connection between Fountain Park (across the street) and Fountain Plaza and Art Gardens for community events to be held simultaneously between the two.
- Design a plaza and open spaces for events to be held at a community and individual scale.

Master Plan



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This is a book about urban agriculture for residents. It explains the design process and installation for a residential urban garden.

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This is a book about 4 different United States cities and how urban revitalization improved the area. The 4 cities are Alexandria, Virgina, Galveston, Texas, Savannah, Georgia, and Seattle, Washington.

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This is the community publication for new residents that move into the city. It gives a overview of the whole community with historical data, current trends, and community information.

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This is a book that summarizes permaculture. It describes how to design, and implement permaculture into a sustainable design.

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This is a official historical website that explains the history of farming in both a large scale and small scale. It breaks down how agriculture affected the public in 10 year increments.

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Is the Merriam Webster Dictionary website that is used for defining words in a quick manner.

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This is an article that explains how snowbirds can cause a shift in population and create massive fluctuations in commerce.

Taylor, Lisa. *Your farm in the city: an urban dweller's guide to growing food and raising livestock*. New York, NY: Black Dog & Leventhal Publishers :, 2011. Print.

This is a book describing urban agriculture on a residential scale. It show how a resident can grow plants and even have livestock within a city.

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Viljoen, AndreÌ, Katrin Bohn, and J. Howe. *Continuous productive urban landscapes: designing urban agriculture for sustainable cities*. Oxford: Architectural Press, 2005. Print.

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“Welcome to Central Arizona Project.” *Welcome to Central Arizona Project*. N.p., n.d. Web. 15 Oct. 2013. <http://www.cap-az.com/>.

This is a Arizona government website detailing out the Central Arizona Project and how it transport water throughout the state.

Appendix:

Site inventory Pictures:

Plant Material

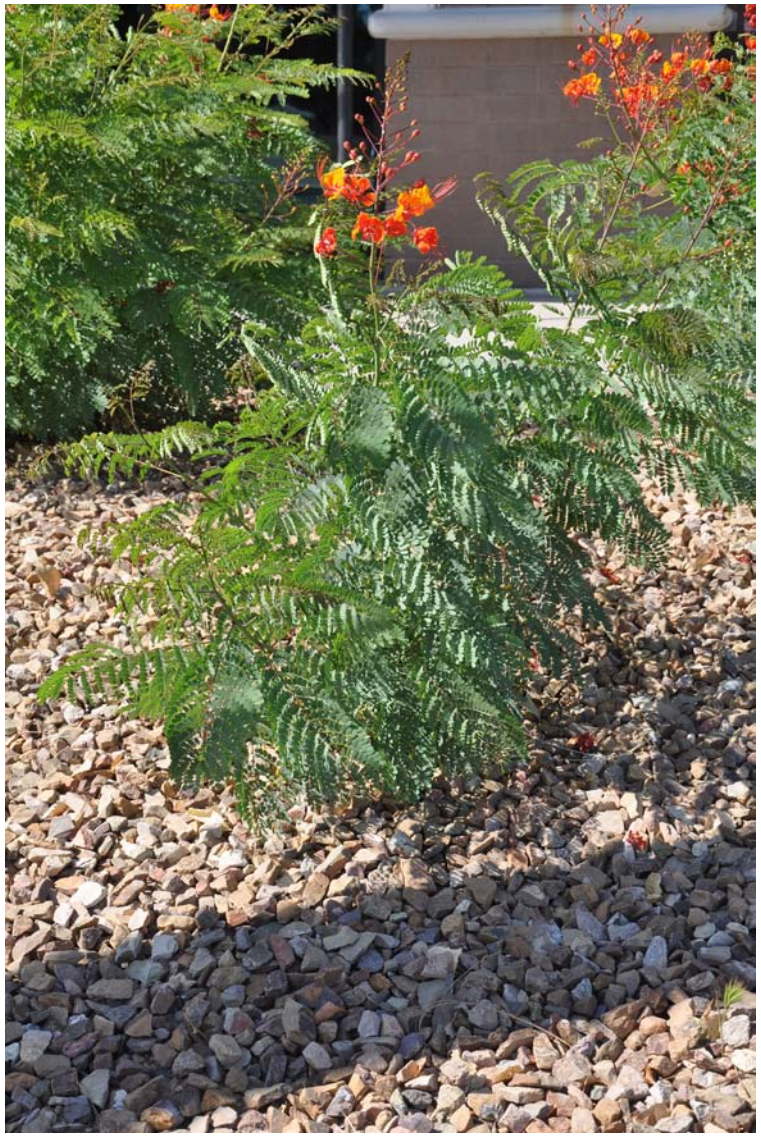

Image of Bird of Paradise

Image of Lantana's

Image of Purple Lantana

Image of Volunteer Desert Plants

Image of Volunteer Desert Plants

Image of Volunteer Desert Plants

Image of Volunteer Desert Plants

Image of Saguaro Cactus

Image of Desert Plants

Materials

Image of a fountain on Avenue of the Fountains

Image of a fountain on Avenue of the Fountains

Image of a fountain on Avenue of the Fountains

Image of a fountain on Avenue of the Fountains

Image of the local banners in downtown Fountain Hills


Image of the benches around the site


Image of the poured concrete sidewalks

Calendar of the thesis process