Creating Celebrations, Food, and Spaces

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Creating Celebrations, Food, and Spaces

Creating Celebrations, Food, and Spaces
A Design Thesis Submitted to the
Department of Architecture and Landscape Architecture
of North Dakota State University

By

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In Partial fulfillment of the Requirements
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Abstract

The city of Minneapolis, Minnesota in the Cedar Riverside neighborhood currently has one community garden dedicated to children. The neighborhood is one of the poorest in the city and is very ethnically diverse. With the University of Minnesota in the neighborhood it would be the perfect opportunity to have the latest technology for growing food. Using underutilized spaces such as walls, rooftops, and parks, will create the perfect area's to grow food. By providing the area with different ways to grow food, people of all backgrounds can have access to healthy food while creating bonds.

Keywords: Landscape Architecture, Rooftop Gardens, Living Walls, Community Gardens, Horticulture.

Problem Statement:

How can landscape architecture improve the lives of city dwellers through

Urban Agriculture?

Statement of Intent

Typology: Urban Agriculture

The Claim: Urban Agriculture has been in the past, traditionally has been growing vegetables on the ground. Today is the time to start growing vegetables on walls and rooftops, otherwise idle spaces. In low income area's there is really no easy access to healthy food. By creating technical gardens that can be gardened by many kinds of people by education, the low income area of the Cedar Riverside Neighborhood can have access to healthy food as well as create bonds within the community.

Object: To create multiple spaces were people with different backgrounds can come together and bond. To teach people about gardening on different planes and methods. Lastly to bring healthy food into low income areas of Minneapolis, Minnesota.

Conclusion: The Cedar Riverside neighborhood is a low income area, with no easy access to healthy food. The project will bring healthy food right to the residents back doors. Through gardening the are will become bonded together through food.

Project Justification: The Cedar Riverside neighborhood currently does not have any public places to grow food. Also the community has a high crime rate. By giving the community gardens to grow produce, it will give ownership over the land, and they will want to take care of it and start to eat healthier (Warman, 1999).

Narrative

With the use of technology and **URBAN AGRICULTURE,** a new way of thinking about growing food will unfold. Growing food is traditionally done on a horizontal plane. The project will include this but will also use technology and look at the underutilized spaces such as the vertical plane and rooftops to grow food. The spaces designed will also provide a place for people to interact and celebrate food.

User/Client Description

Right now the Cedar River Side neighborhood is called, “Little Somalia.” It has been the portal for immigrants into Minneapolis. The Somali diet is based around meat, but because Minneapolis does not allow for farm animals to be within city limits, this could help push them into letting them have meat animals. The vegetables and fruits appear as side dishes in the Somali diet which include bananas, dates, apples, oranges, pears, grapes, green peppers, spinach, and garlic. This will be considered when making design choices on providing space for some of the produce above to be produced (“The food of,”).

Urban Agriculture includes many people to make it happen.
The master gardener will be in charge of making sure the garden runs smoothly. They will be responsible for the garden’s day to day activities, such as how to grow food in small spaces workshops, how to garden on the wall, and up keep. He or she will also responsible for making sure the plots are being maintained, cleaned in the fall, and planted in the spring.

The program director will be responsible for setting up various programs that will be taking place in the garden. They will also be in charge of advertising the events. The program director is in charge of educating the public about the living walls on the topics of maintenance and planting. The events will include the composting lessons, how to preserve your produce classes, youth events, and Gardening 101. Gardening 101 will be more designed for people who just immigrated to the United States classes and will teach people how to garden in the region or teach people who do not know how to garden. At the risk events would include but are not limited to doing maintenance to the common areas of the gardens, building structures, tilling in the fall and in the spring and maintaining compost piles.

The Public Housing Authority will also be a partner in this thesis project. They will be able to lend the land/roof/wall to the residents of the area to create the community garden.

The city of Minneapolis will be responsible for possibly rezoning the land and creating policies that will affect the dynamic of the gardens. As of right now, the city of Minneapolis does not allow farm animals within city limits, which include chicken, cows, horses, and so on. The city of Minneapolis could revisit that rule and possibly change it.

The Cedar Riverside neighborhood will play a major part in the creation of the three gardens. Education about the gardens will need to take place. The number of people that will be using the garden will vary, but the gardens will be maximized for the most people. People of different types of backgrounds and education levels will be able to garden in the most technical method presented, the living walls and hydroponic gardens in the greenhouse.

Project Emphasis

The thesis document will explore the idea of gardening on different planes while benefiting the city dwellers by improving overall health.

By using spaces that are vacant, roofs that are idle, and walls that are futile, the project will solve the overall question of how landscape architecture can improve the lives of city dwellers through urban agriculture.

The big picture of the thesis will be to bring healthy food to low income areas of the city of Minneapolis, Minnesota.

The major points of my thesis are living walls, community, rooftop gardens, and supplying the low income public with healthy food. To design for this I must complete an inventory and analysis of the current community gardens, farmer's markets, grocery stores, bus routes, building heights in relationship to sun exposure and soil inventory, possible rezoning, master plan of the three sites, sections of the rooftop garden, and construction detail of the living wall. The inventory and analysis of existing community gardens and farmer's markets is to ensure that the locations of the gardens will maximize the benefit to the community they are located in.

The master plan will be for construction of the three sites and for people to see what the gardens are going to look like and what is all included in each garden site. The section cut of what is underneath the garden the will be to educate the public about the roof system so they can gain an understanding of how the system works. this will be displayed somewhere on the rooftop for people to see.

The Under utilized park will feature public meeting spaces, class space, growing spaces, orchard, and farmers market. The rooftop will include a cooking area, growing spaces,

Major Project Elements

Major project elements in the design for the Greenwall is going to be recognizing where the people can gather and talk about food and the growing system provided.

The rooftop garden will have a kitchen space for people to come together and celebrate the harvest, cook food, and share ideas. Growing spaces, elevator, place to pick up produce, and greenhouse structure for winter growing.

The open space will have a farmer's market, plaza's to gather in, greenhouse for winter growing, parking lot, and orchard.

The rooftop and open space will have compost bins, trash cans, sheds for tools.

Site Information

When determining the neighborhood that the sites would be located in, I looked at two major things and those were diversity and income.

Diversity

Next on the criteria was to look at the ethnicity aspect of the neighborhood. When reading through the Cedar-Riverside Location and general Characteristics the neighborhood is described as, "…a beehive of hippies, intellectuals, actors, artists, and musicians. Presently, the Cedar-Riverside neighborhood boasts the largest community of immigrants in the Twin Cities, continuing a long history of ethnic and cultural diversity." From the U.S. Census of Population and Housing come the ethnicity percentages of Cedar-Riverside. In 2000 3,068 people were white, 2,409 Black, 59 American Indian, 1,184 Asian, 426 Hispanic, and 399 of other races.

The neighborhood demographics also show that the people living here are very diverse. Out of the population of 9,508 people 35% of the people are in their 20's, 20.6% in their teens, 13% in their 30's and 10.5% under the age of ten ("Cedar-riverside Demographics,").

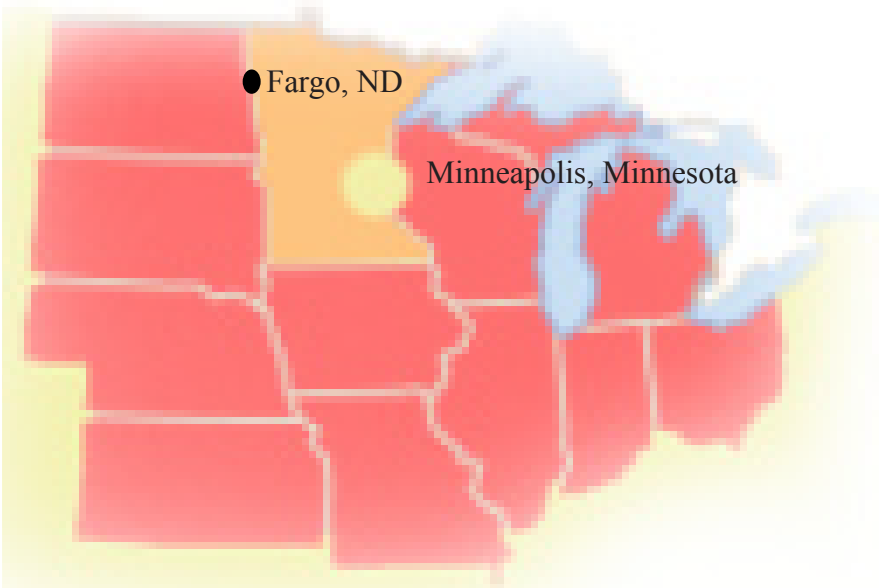
Income

Finally, the aspect of income, according to the City of Minneapolis web site, in 1979 the median household income for the neighborhood was $16,215. The city of Minneapolis was $33,101. Since then the gap has grown. Now in 1999 the median household income for the neighborhood was $14,367 and the city was $37,974.

Minneapolis poverty data gives more insight into the situation of income between the city of Minneapolis and Cedar-Riverside. In 1999 The city had 17% of people below the poverty level. The neighborhood was at 42 percent, which is a difference of 13 percent more people.

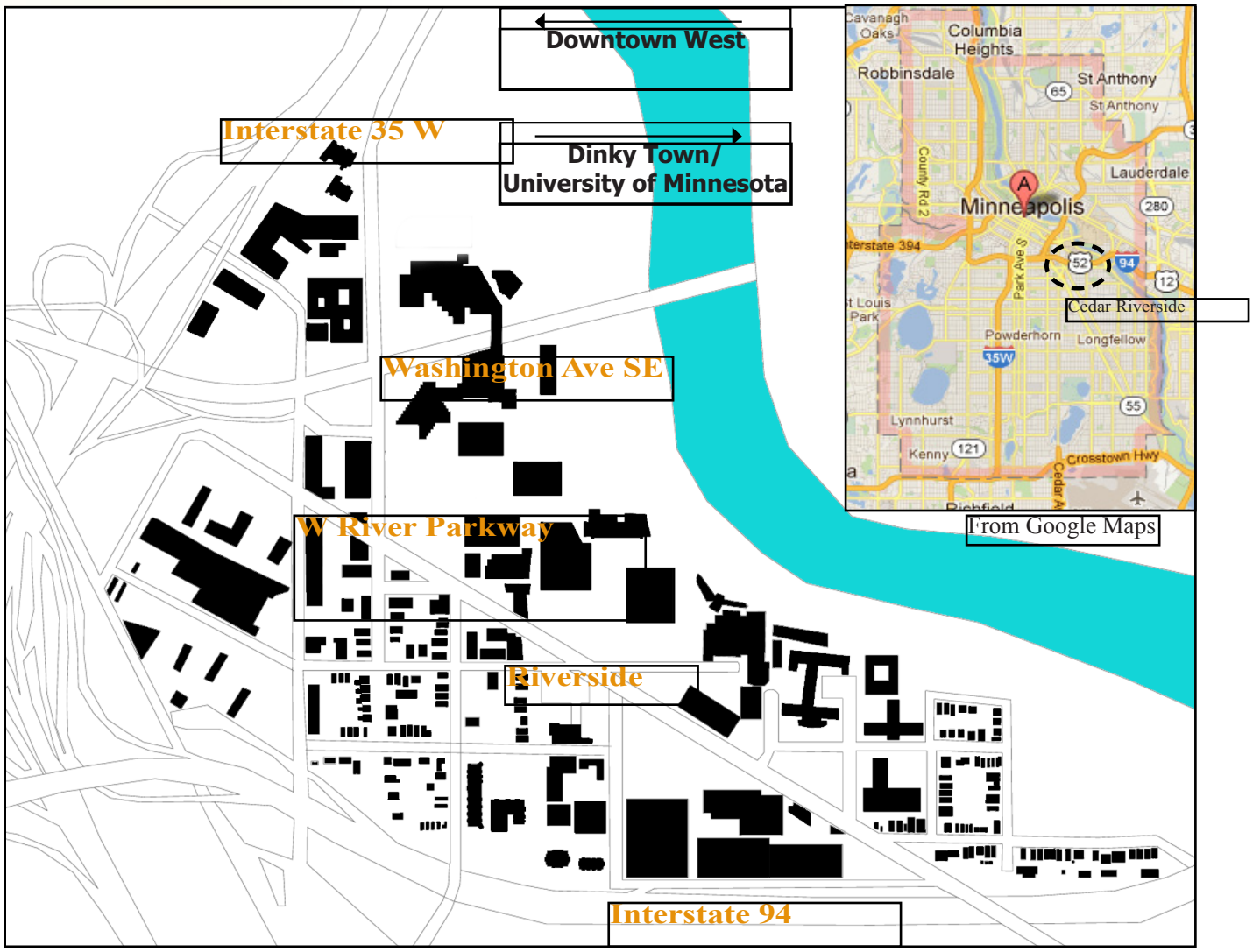
The neighborhood demographics also show that the people living here are very diverse. Out of the population of 9,508 people 35% of the people are in their 20's, 20.6% in their teens, 13% in their 30's and 10.5% under the age of ten.

The information stated above has shown that this neighborhood would be a affected the most with the creation of a community garden system ("Oficial website of,").

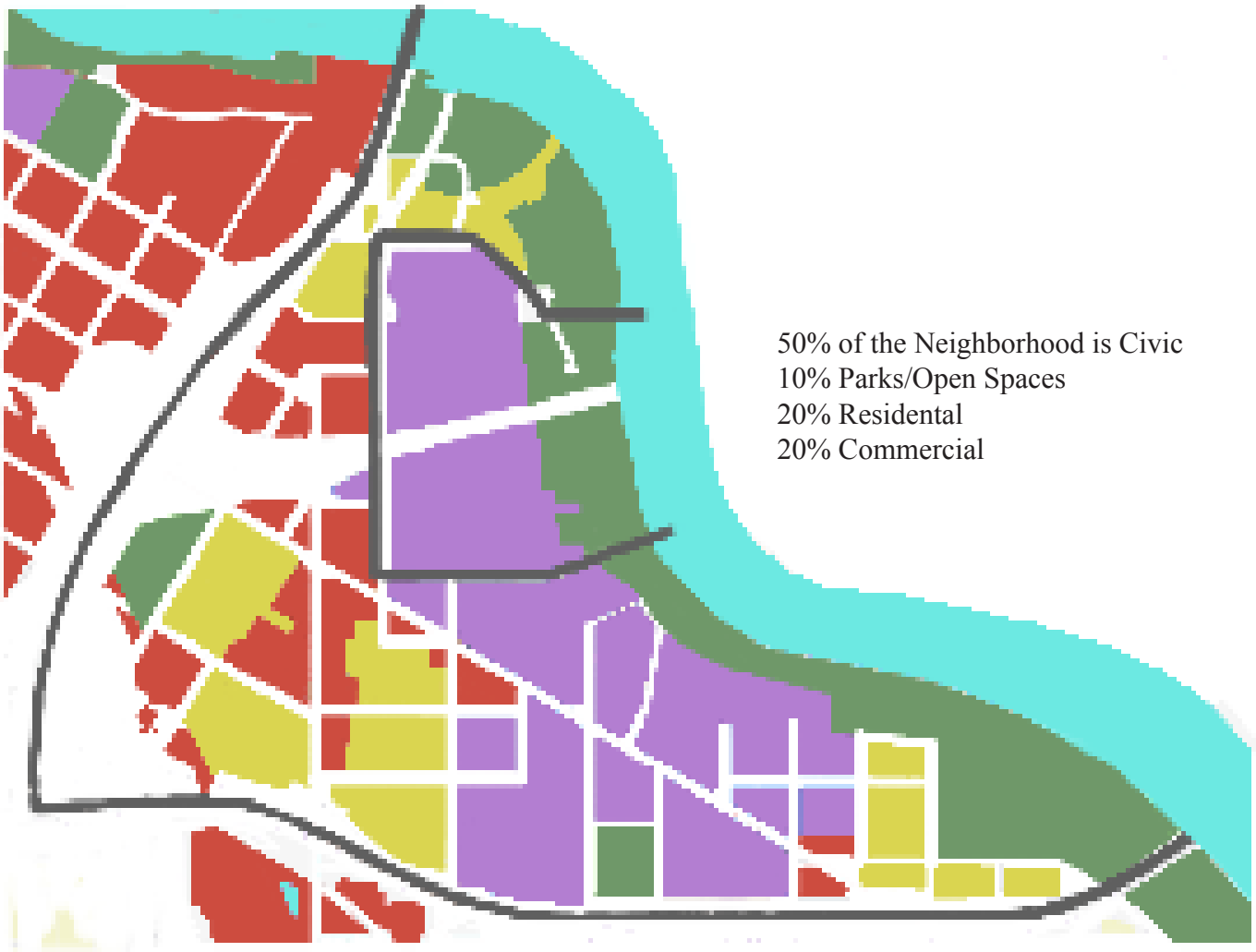


Location Map

Location of the site is in Minneapolis, Minnesota, in Cedar Riverside neighborhood. The gardens are located on top and on the exterior of apartments and a park.



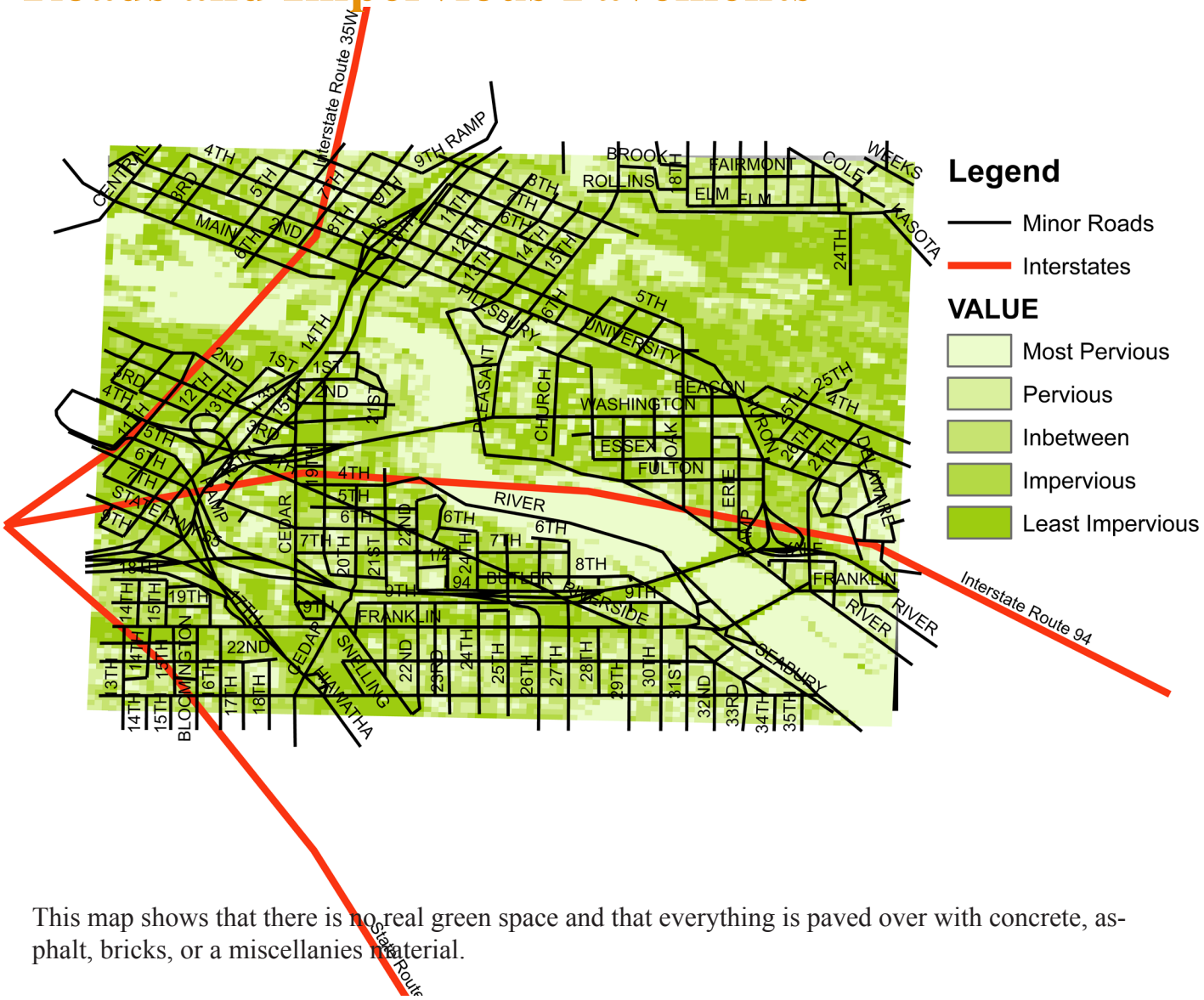
Zoning



50% of the Neighborhood is Civic
10% Parks/Open Spaces
20% Residental
20% Commercial

Purple=Civeic-Hospitals, Colleges.
Yellow=Residential
Red=Comercial
Green=Parks/Green Spaces
Blue=River
Dark Grey Line=Neighborhood Boundary

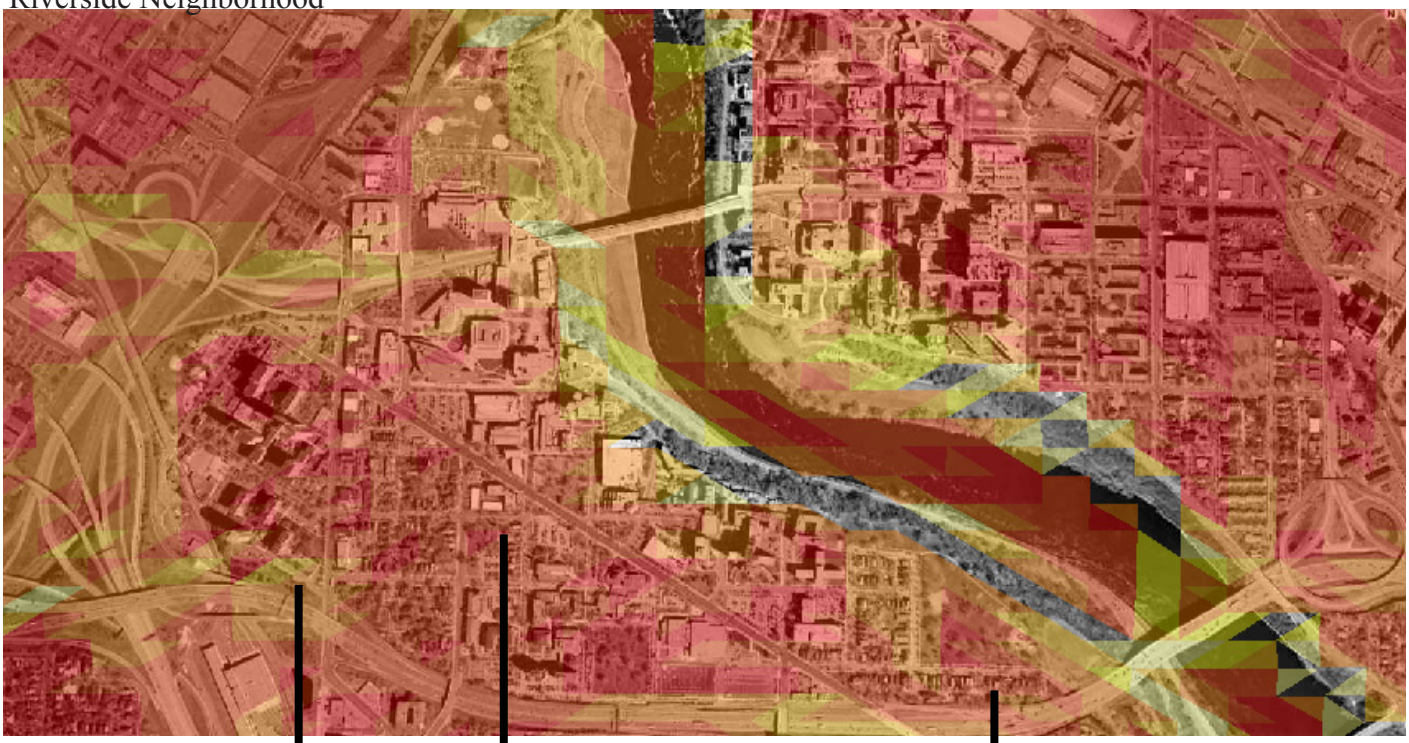
Roads and Impervious Pavements



This map shows that there is no real green space and that everything is paved over with concrete, asphalt, bricks, or a miscellanies material.

Slope

The map below shows the slope throughout the Cedar Riverside Neighborhood



Site 1
Maximum slope 17%-20%
Minimum slope 4-10%

The site ranges from a relatively flat site. Meaning that normal activities can take place here.

Site 2
Maximum slope 1-4%
Minimum slope 1-4%

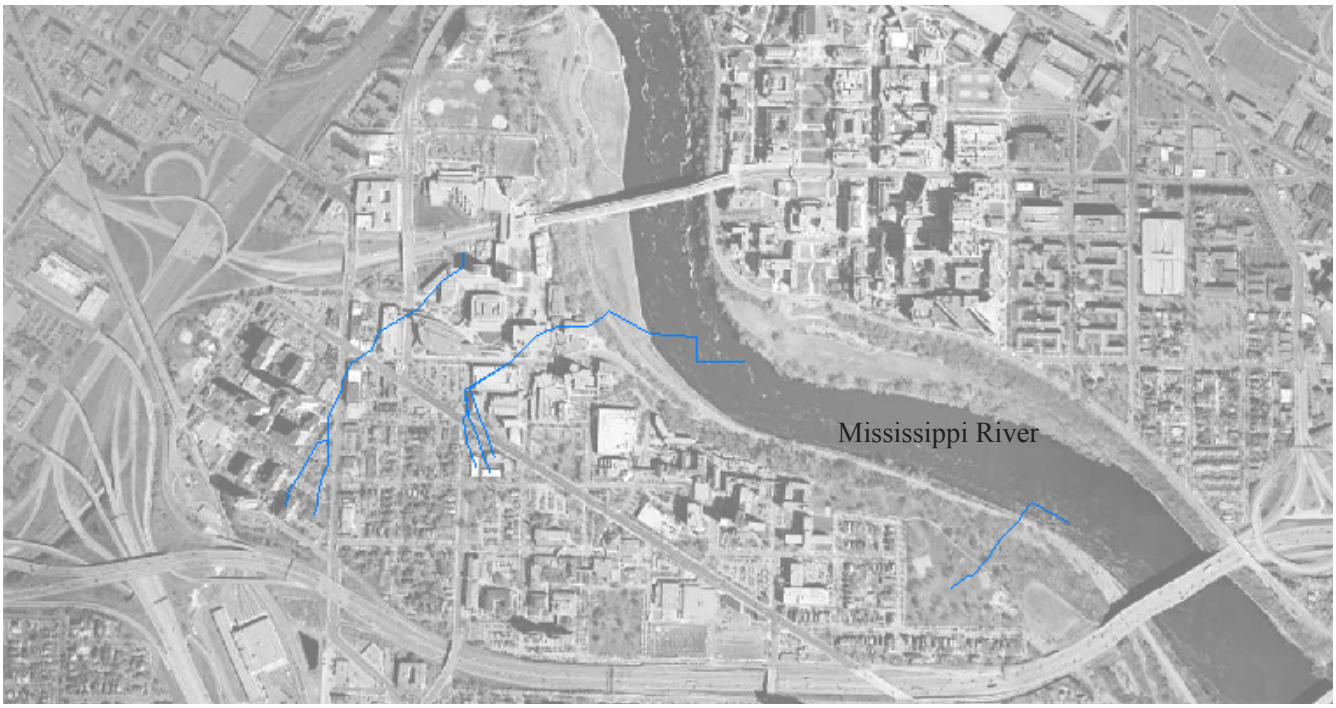
The site is flat. Normal activities can take place here.

Site
Maximum slope 1-4%
Minimum slope 4-10%

The site is relatively flat. Normal activities can take place here.

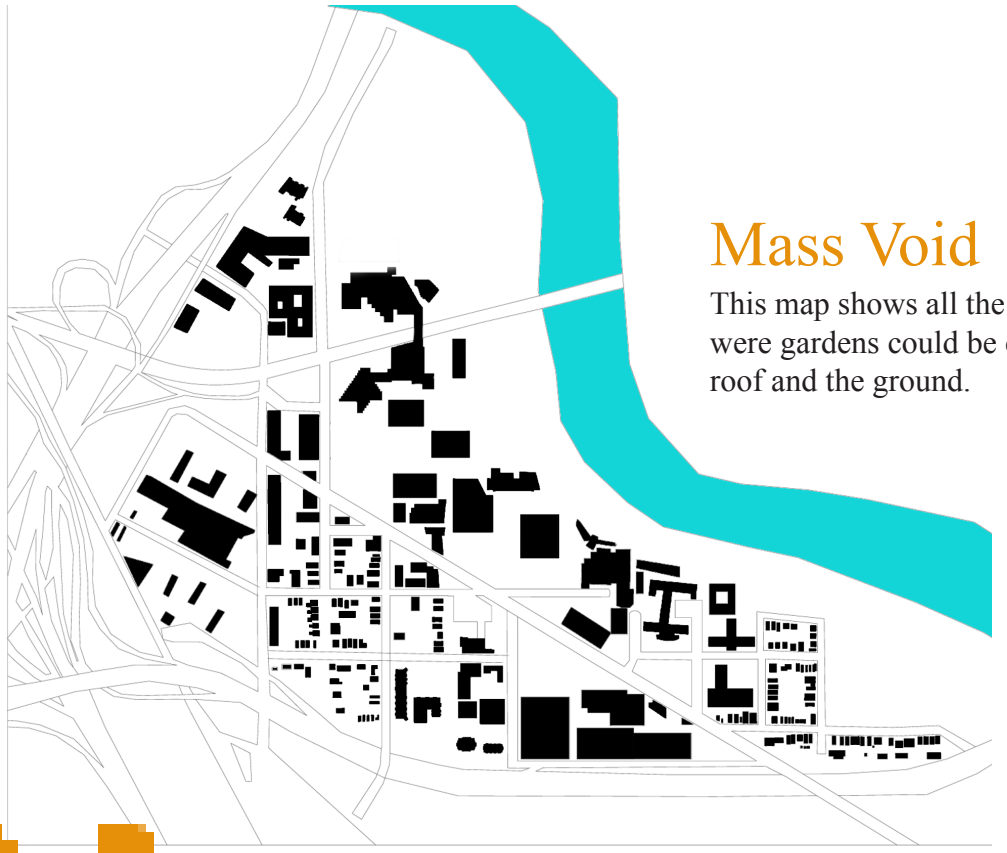
Slope and WaterA Analysis came from google earth, and Civil 3D CADD

Water Analysis



*Kowing were the water flows off of the sites, shows which way the slope is going.

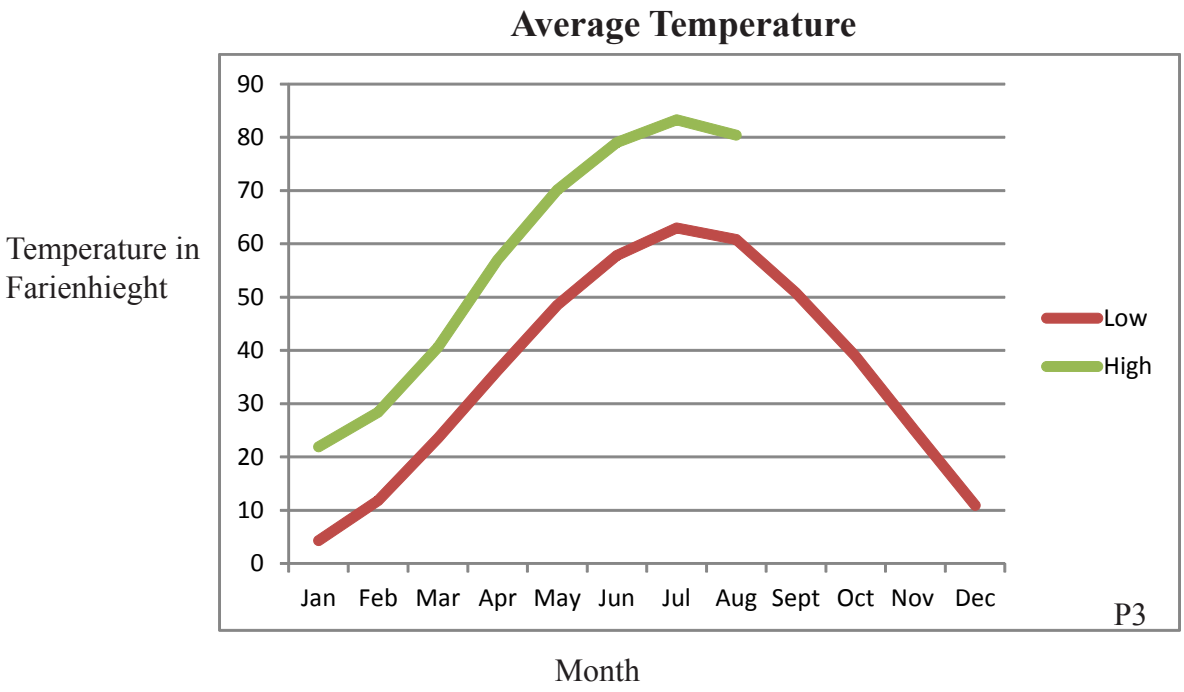
Where the water flows



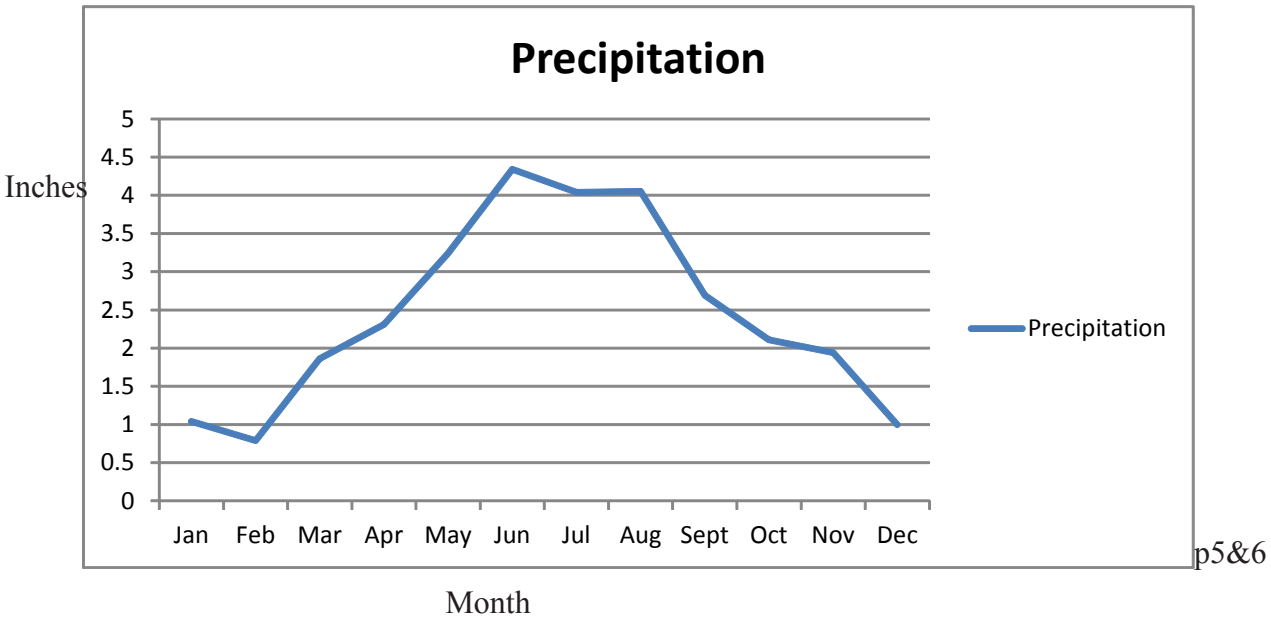
Mass Void

This map shows all the possible spaces were gardens could be created, both on roof and the ground.

Climate Data

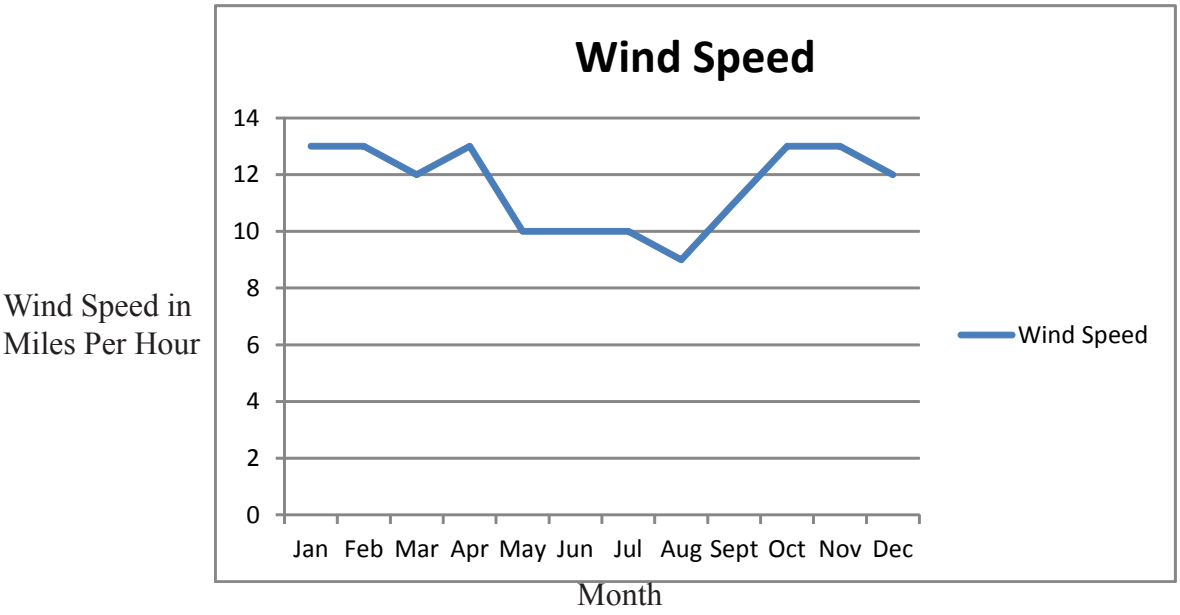


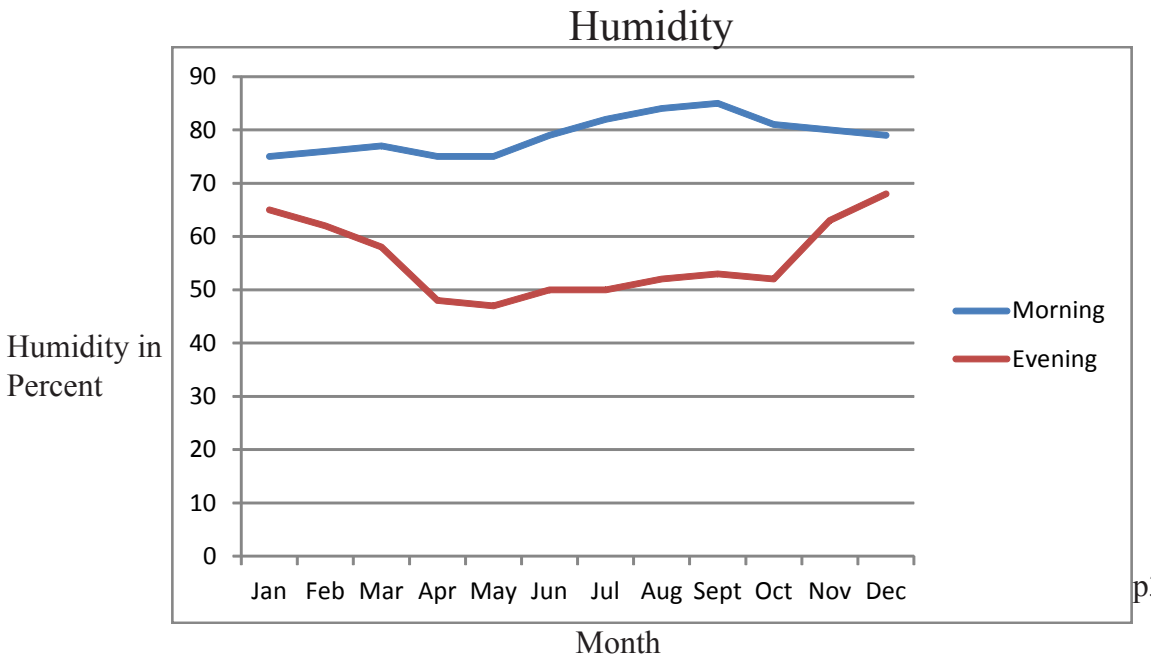
P3



p5&6

Climate Data





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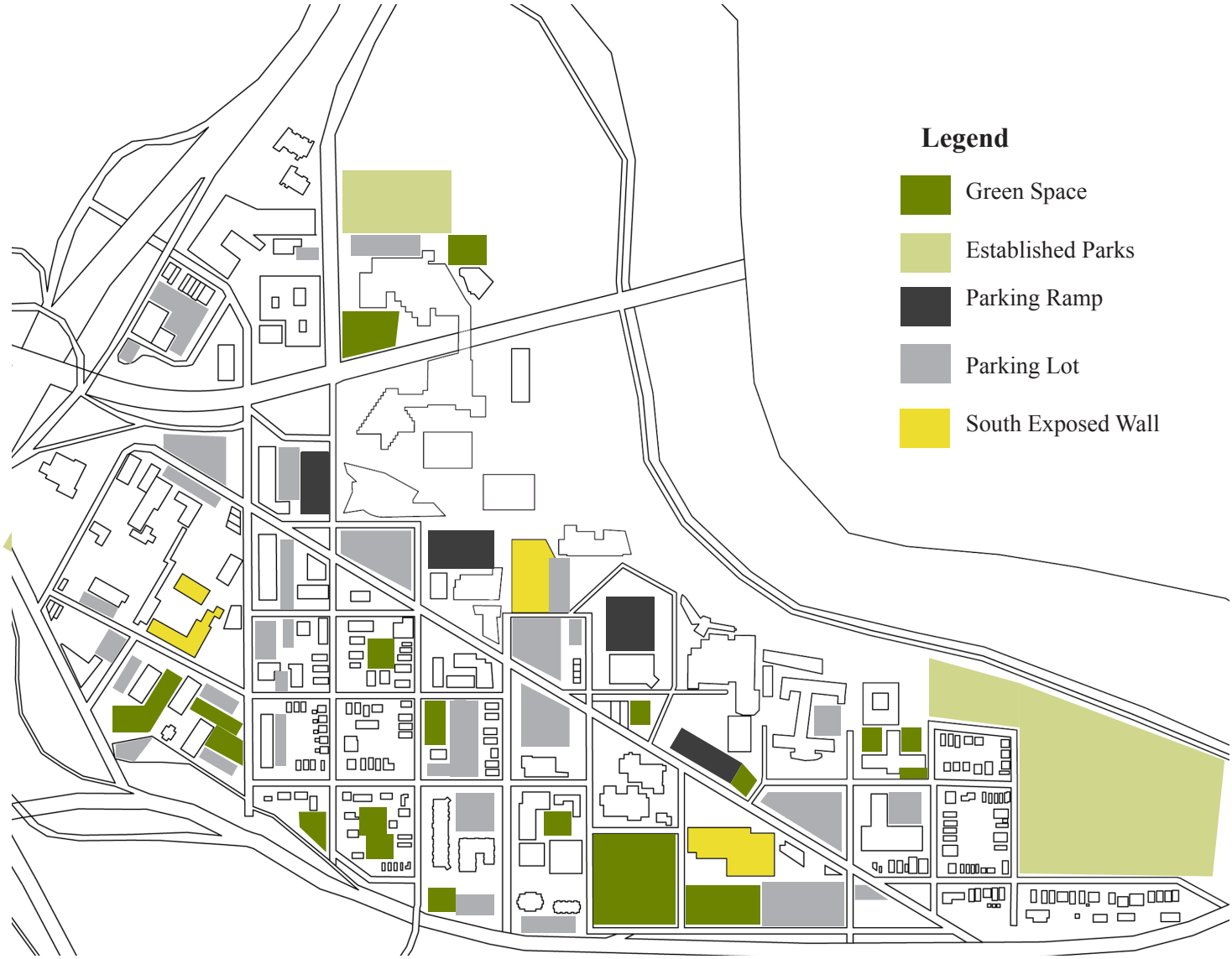
Inventory and Anaylsis of the Site

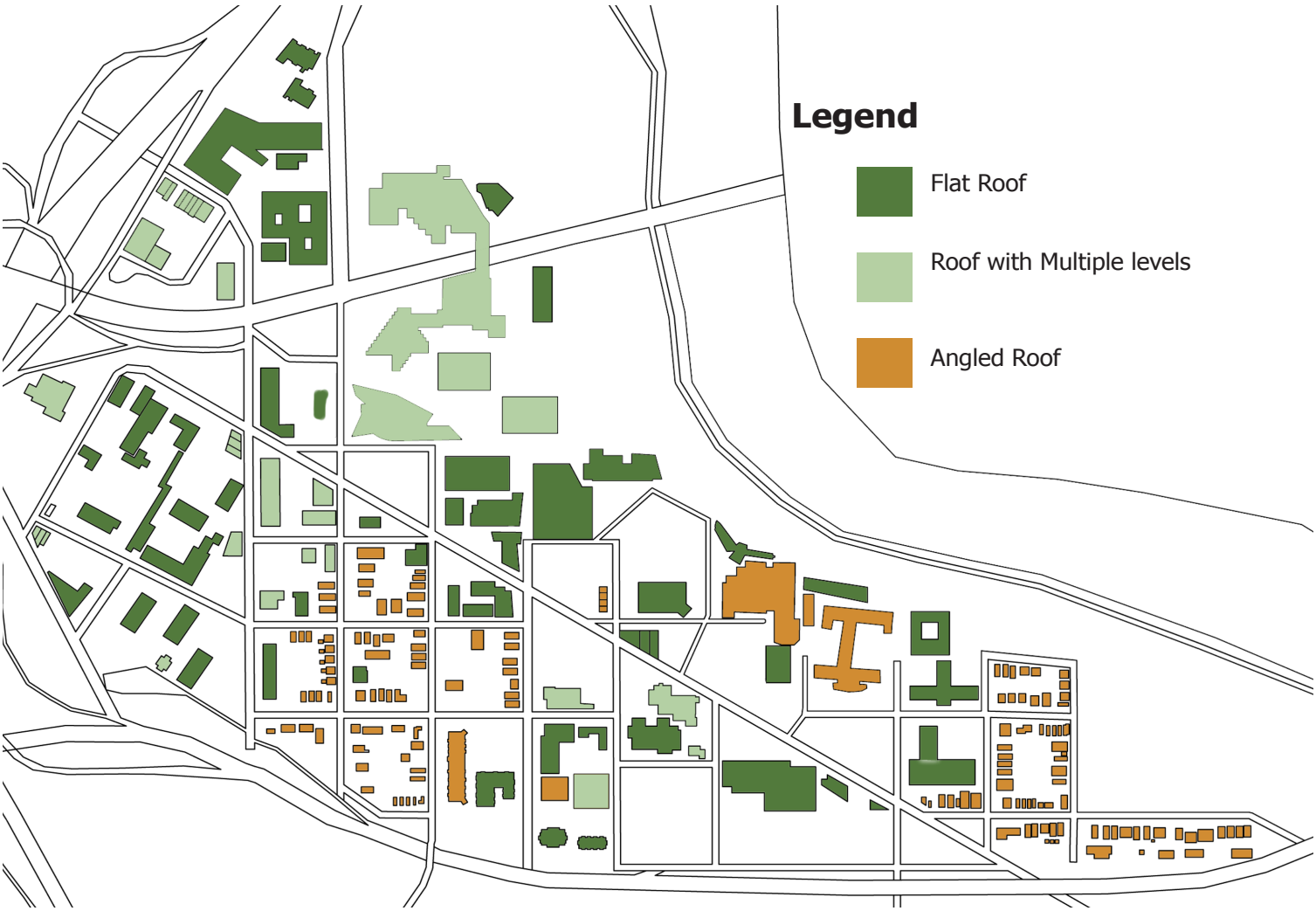
If locate the three sites where my interventions would take place. The first thing that was considers were the open opportunities. Green Space, Established Pakrs, Parking Ramps, and Parking Lots were identified nd assesed where the biggest and the an outlying space that was not being utilized to it's full potentional. The biggest site, site 3 would be the big established park in the south east side of the site, which will be identified later.

The next thing that was assessed were all of the south exposed walls for the greenwall system. The site would be the smallest of the three sites within a high residenal spsace. The site would be near a highrise residental area, and was choosen to be individual spaces on the balcony walls of the high rise residental buildings in the area in the south west corner of the site,w hcih will be identified later.

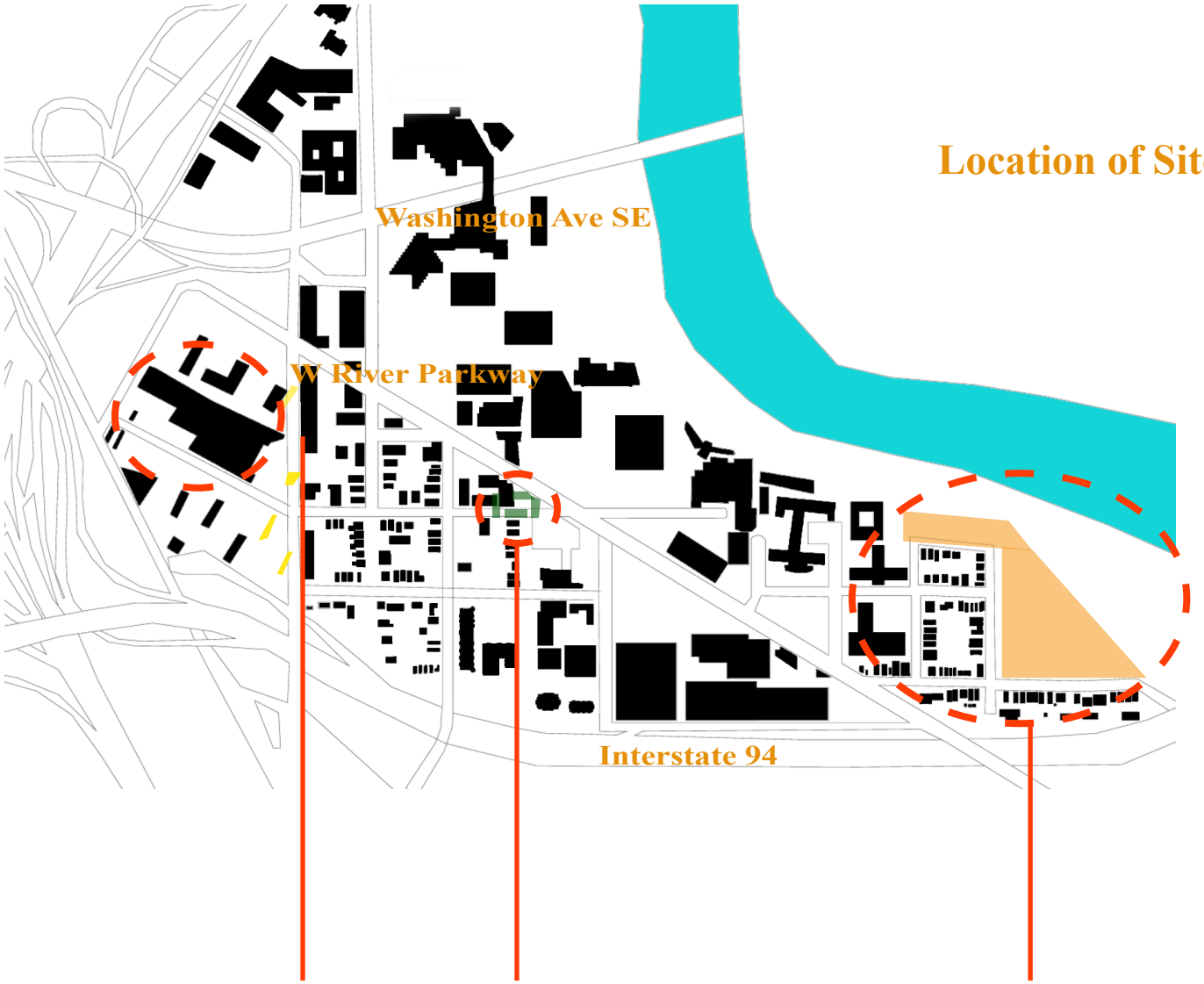


Inventory and Anaylsis of the Site

The last thing that was assesed was the rooftops. By looking at the flat roofs, roofs with mulpile levels, and angled roofs, the 2nd site was choosen in the middle of the site onto of residental buildings.



Location of Sites



Site 1

Green Wall

The green walls are facing the south east which will receive good morning light.

Site 2

Rooftop

On top of a four story building to the north west side and smaller two story town homes to the south west, will be the rooftop gardens. The gardens will serve the residents on the block and serve as educating the dance studio users about good nutrition.

Site 3

Park

This is the largest of the three sites. The main part of the site is a park already with a tennis and basketball court. Since it is right near the river. The river can irrigate the farm. Here people in the neighborhood can have their own plot or have a large plot with a few people and will sell the extra produce at the farmers market.

Plan For Proceeding

Methodology

The design will use the mixed method approach. The method used both quantitative and a qualitative data.

The quantitative and qualitative data will be used throughout the design process. Part of this research will be for determining were the three sites should be, as well as during the design process. This data was determined based upon the theoretical premise and project typology. The qualitative data are things like views, light quality, wind, human characteristics, ect.

The quantitative data will give statistical data to support thequalitative data. The data include but are not limited to utilities, vehicle traffic, and soils.

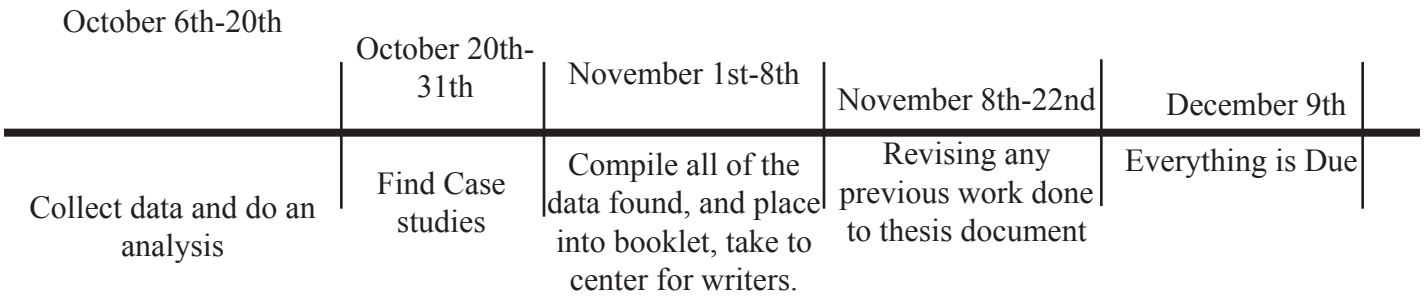
Documentation

Documentation of this process will be through graphics, plans, sections, construction documents and 3-D modeling, and photographs.

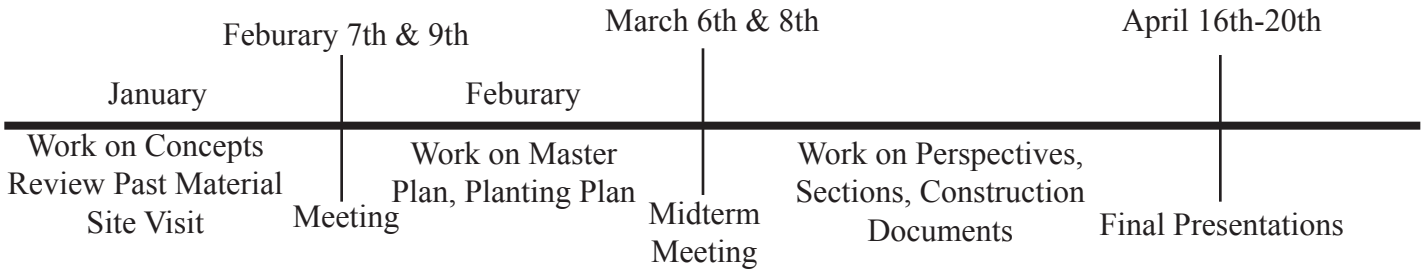
Work Plan

What I plan to accomplish during the time frame that I have set for myself.

Fall 2011 Semester



Spring 2012 Semester



Research

Rooftop Gardens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History

The very first roof top gardens were of ancient Mesopotamia. The gardens were built around 600 B.C. They were located in major cities temples courtyards. Outside stairways lead people up to the gardens. The gardens had trees and shrubs planted on top of them for people to get out of the heat. But these gardens weren't the only ones around at this time.

The most famous of the historic roof tops are The Hanging Garden of Babylon. The gardens are considered one of the Seven Wonders of the World. The first account of the gardens in writing is from a priest around 250 B.C., which is believed to be 200 years after the garden were destroyed.

The gardens are believed to be constructed from when Babylon was being rebuilt by Nebuchadrezzar II, for his wife because she missed her homeland.

The garden was 100 feet long and 100 feet wide. The garden had tiers that resembled a theater. The garden was supported by vaults. The highest vault was 70 feet tall. The structure of composed of 16 foot long stone beams, with a layer of thick reed set in tar. On top of that were 2 courses of clay brick put together by cement. Lead then covered the top to prevent moisture from getting into the different layers. The soil was so thick that a fully matured tree could be supported.

Pope Pius II is credited for creating one of the first and best preserved roof gardens of the Italian Renaissance period. He hired architect Bernardo Rossellino. He created a plan for the center of the town and the buildings that surround it. Palazzo Piccolomini is the building that has a roof top garden. Because the structures were built on a hillside, lower levels are downhill, which would be below grade. The upper story would seem to be on the street level. Through arches that support the second floor the roof top garden is at the rear of the building. The garden were used a lot when Pius II lived because he would hold gatherings in the gardens. Today the garden holds boxwood parterres. Only tour groups get to see the gardens.

At 120 feet high, four 15 foot oak trees live on top of the Benettoni Tower. The tower was a house and was built by the Guinigi family, who were silk merchants. The tower is now open to the public. The gardens can be accessed from the inside stairways. The soil for the garden is 2 feet deep and irrigated. The date of the garden is around 1660.

The Medici Roof Garden of Carggi, Italy was built in the early 15th century by Cosimo de' Medici. It was ruined and does not get a lot of visitors. The building that the garden was built on is now a medical


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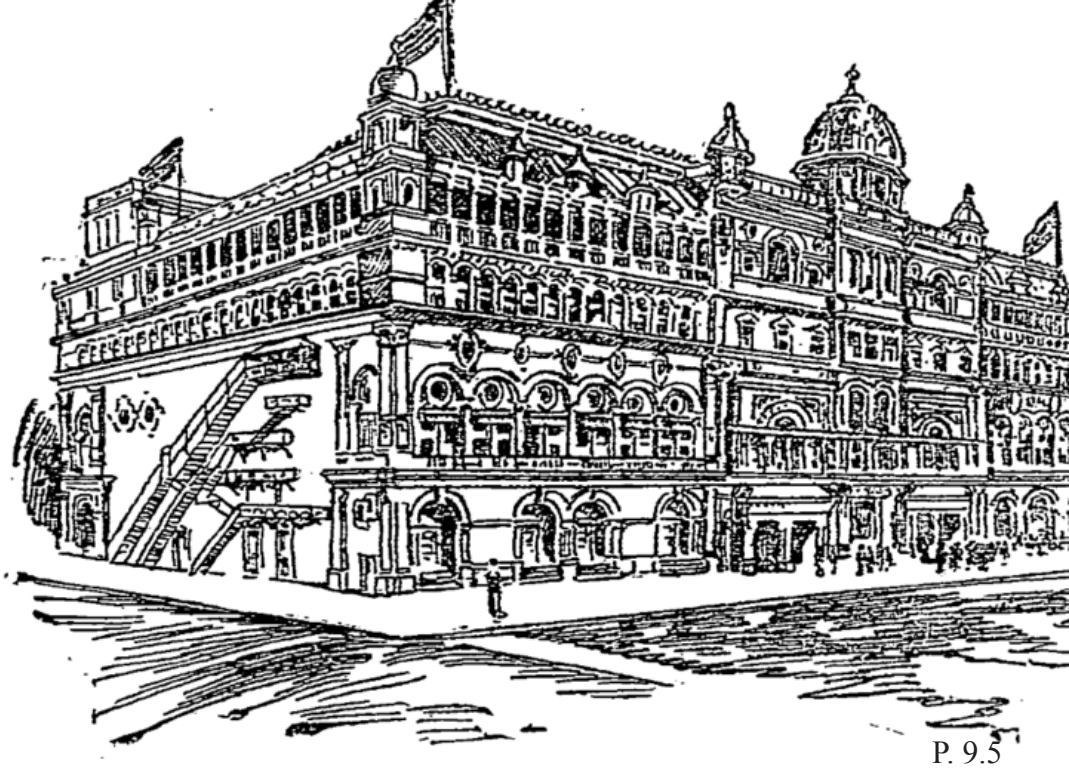
building. In the garden's prime, it was filled with soil that supported many imported plant materials. During the time when the garden was built Medici pride was based on importing exotic planting species. It was a sign of wealth and power.

The city of Tenochtitlan's roof top gardens did not survive when Hernan Cortes destroyed the city in 1521. Letters that Hernan Cortes sent to King Charles I of Spain described the gardens that once were. The city was mostly made of islands, which limited the space for gardens at garden level. The roofs were an extension of the ground and were used throughout the city for gardens.

1600-1875 evidence of roof top gardens was evident throughout Russia and Europe. In Passau, Germany, cardinal Johann Von Lamberg construction a rooftop garden for his residence.

In Moscow, Russia, a twostory rooftop garden was built on the Kremlin palace. 10 acres of the garden were built on the same level as the rooms. Two additional terraces cascaded down towards the Moscow River. The upper garden supported a 1,000 square/foot pond that had fountains. Water from the river supported the pond. The upper garden used 10.24 tons of lead. Plants were planted in boxes or tubes. Fruit trees, shrubs and vines were used extensively around the perimeter of the garden. Props and heavy duty beams supported all of the weight from the garden above.

In 1796 Catherine II had Italian architect Bartolomeo Fransesco Rastrelli design her winter palace. The stables of the palace featured a rooftop garden that showcased her art collection. The walkway was made from flagstone and the smell of lilacs hung in the air. A person would enter the garden from the Pavillion Hall gallery. Four statues surrounded a fountain on one end of the garden. In Berlin, Germany a middle class man reinvented how to waterproof his rooftop garden with vulcanized cement. The technology would be showcased at the 1867 World Exposition of 1867. But a failure og reinventing water proofing roofs in Munich, Germany King Ludwig attempted to use copper plate on the stone arcading. In 1897 the garden had to be destroyed because it leaked so badly. The Norwegians had a different approach to green roofs. Sod roofs were simply soil that was planted with grasses and other plant materials for stabilization. Today most of rural Norway still has the sod roofs. The technique that was perfected by the Norwegians was carried into the Great Plains in America in the 1800's, where timber was often scarce. The roofs were not as successful as their ancestors and leaked very badly and were more times than not abandoned or replaced by something better when the railroad came through (Center, 2008)



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Turn of the Century until World War II

During this time period rooftop gardens were used for summer entertainment. A man by the name Rudolph Aronson gathered investors and built the Casino Theater in New York City. Located on Broadway and 39th, it was the first roof theater designed with a stage. The building also had an indoor theater for the winter months. The theater roof garden had a sliding glass roof to protect the performers and the audience from rain. Garden was a huge success. Eight year later after opening, Madison Square Garden was built.

Madison Square Garden was designed with Italian Renaissance design in mind. On Madison and 4th avenue, the garden would call its home. Just like the previous garden mentioned, it to was financed by wealthy investors. A structure was placed on the site that stands 300 feet tall and people can go up and see the city. Rooftop gardens started becoming very popular, because in 1895 another garden was constructed. Oscar Hammerstein's Olympia Music Hall was 200 feet long and 100 feet wide completely encased in glass. The ceiling was 65 feet tall. The interior was complete with pocket grottoes, arbors, and mountain crags. The setting was the mountains with a 40 feet long and 3 foot deep lake with a wooden bridge, ducks, and rocks. The stage had a mountain scene painted on it as well. Another garden that had a theme was the Republic Theater.

Built in 1900 the setting of this garden was a Dutch farm. The farm included things like a windmill and miller's cottage. The garden also had a rural bridge, stork's nest, duck pond, and even cows.
All good things come to an end and in the 1920s, with the invention of air conditioning and movie theaters, started to close and the buildings demolished (Center, 2008).

Hotel and Residential Roof Gardens

The theater garden boom left some lasting impression on residents and investors. This started having hotels putting gardens on their buildings as well and going even bigger. One garden that stood out during this time was the Hotel Astor, which came about in the early 1920's.

It was a 1,000 feet long and was located between 44th and 45th Street, on the west side of Broadway. The Hotel Astor roof garden had a promenade lined with trees and was lit during the summer nights. When Madison Square Garden declined in popularity the Hotel Astor featured such bands as Frank Sinatra, and Harry James. Hotels were not the only ones excited about roof gardens a high rise bordering Central Park got a roof garden.

Landscape architecture Vital & Geifert and Annette Hoyt Flanders designed an elevated garden on the new high rise. The gardens became a precedent, a status symbol for the wealthy and penthouse expectations. Even architects were starting to get on to the bandwagon.

Architects Frank Lloyd Wright and Le Corbusier both started to design roof gardens but had two different views on them. Wright though of them as extensions of the interior and Corbursier designed them to be a functioning space. Seen in the Midway garden located in Chicago, Frank Lloyd Wright designed a terraced garden on the roof used for seating. The garden was built right before Prohibition, and when Prohibition took effect the city fell on very hard times and the building and garden were demolished in 1923. Another garden Wright designed was in Buffalo, New York. The garden featured again a terrace to extend the lunch room to the outdoors. Another garden he designed was for a hotel in Tokyo which was also demolished. On the opposite side of the spectrum was Le Corbsier.

Also known as Charles-Edouard Jeanneret, he was a Swiss architecture that strongly designed roof gardens with the intention of having them to be a living area, an exterior room. Villa Savoye was built just outside of Paris. The space had views to the country side and was encased in glazed window. Other projects of his included Unte d'Habitation apartments in Marseille Chandigarh, India, Costa's Ministry of Education; and Rio de Janeiro (Center, 2008).

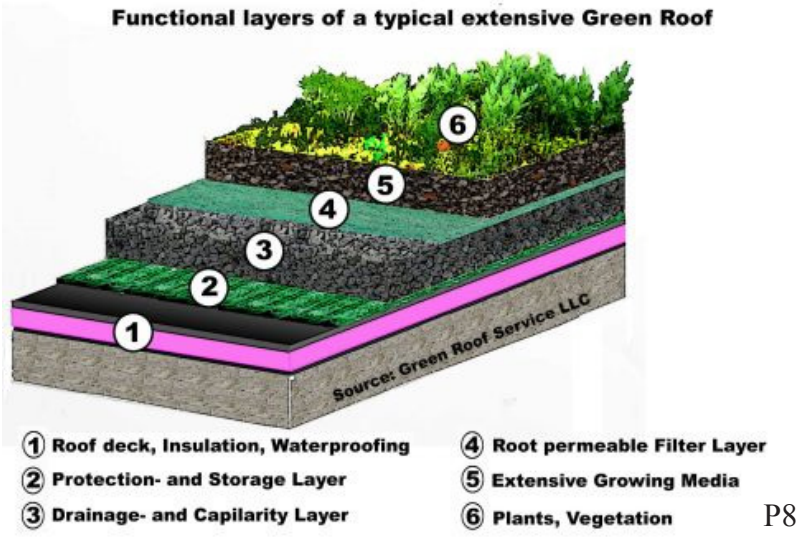
Gardens of the Pre War Era

A famous garden of this period was Derry and Tom's Garden. The garden was onto of Rockefeller Center in New York. It was completed in 1930. While the war was being fought another roof top garden emerged. Union Square in San Francisco was a public park built in 1850 when the mayor donated land for the park. Because of the timing, the area remained undeveloped and started to become a dumbing ground. Homeless people and prostitutes started gathering in this space, as well. In the 1870s the park started to take shape with exotic plants, and in turn churches started to develop around the space. 1903 President Theodore Roosevelt gave the city the Dewey Monument, which was put into the park. As the park stands today, as Timothy Pflueger designed, it is on top of a parking garage. The park was finished in 1942. It was the first roof top garden that was built on top of a parking garage. Since then the park has been redesigned after a competition, and construction was supposed to take place in the 2000s.

Roof Gardens after World War II

Between before the Depression and the early 1960s roof garden construction nearly halted. Some of the projects built after this were the roof gardens at Kaiser Center in Oakland, Oakland Museum, and Postsmount Square in San Francisco.

By taking a look at the extensive past of roof to gardens one can draw from them inspirations on designing one today. The history of rooftop gardens has evolved from using 10 tons of lead to line the roofs to prevent leaking to today's thin waterproofing membranes. According to Green Roof Technology's web site and the book Green Roof in Sustainable Landscape Design, there are 2 main green roofs that designers use, one being extensive roofs (Center, 2008)



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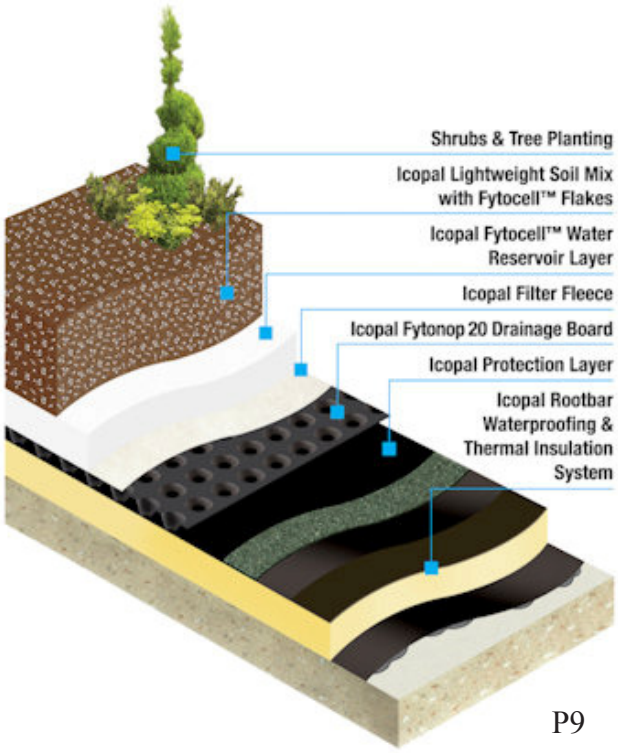
Extensive green roofs

Extensive Green Roofs are only 3-5 inches deep of growing media. The weight that this system puts onto a structure is 15-25 pounds per square foot. Maintenance of this roof is very low. The plants that this system can support are: mosses, sedums, succulents, herbs, and a few types of grasses. 3

When picking out what plants to use for this roof, keep in mind the micro climate, hardiness of the plants, ability to endure in thin soils, and unprotected conditions (Center, 2008).



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Intensive Green Roofs

The overall depth of these green roofs can range anywhere from 7 to 24 inches plus. The weight that this garden puts on a structure is 35-80 plus pounds per square foot. Plant materials that are grown on this roof are perennials, lawn, putting green, rooftop farming, trees and shrubs. Intensive green roofs do need irrigation, and it can either be flood, or automatic. Maintain is high with this type of roof. The main use for this system would be for parks or the client wants a garden. The cost associated with the roof is high (Center, 2008).

Benefits

On of the benefits of a green roof is aesthetics. Compared to a asphalt roof to a green roof, a green roof will just look much better.

Storm water management is a newer idea but by putting a green roof on top of a building, it will decrease the run off by absorbing the rainfall. A designer could also build a basin to store the excess water the roof does not take in during a heavy storm event. The water then can be re used when the garden needs water.
With the dark pavement material all around the urban environment heat island effect can really get to a city. Green roofs may offer a solution to the problem. Not only does heat hover around the building but also urban environments are also facing problems with smog, and air pollution, which cost more in the area of energy consumptions. Pollution also causes health issues and stress. Planting a green roof on a building, by the process of evaporation from the plants, can cool the air around them, causing the temperature to go down.
Green roofs have a thick system to keep the water out and the plants satisfied, which in turn can reduce the sound of traffic or airplanes and insulate the building, making the energy to heat the building go down in cost. Through the process of respiration plants take in carbon dioxide and release oxygen, and with global warming threatening, green roofs could possibly be a small solution to the problem.

Factors associated to knowing whether or not there are any economic benefits to a green roof are harder to measure. But one thing is fact that a green roof will outlive a typical roof. Green roofs save energy as stated previously, they have financial incentives and tax breaks associated with them and that's just to name a few.

Habitat Restoration

Green roofs have the benefit in that they give plants a place to be and replenish themselves if they are endangered. The roofs also provide a protective setting for some species of birds.

Efficiency in Phovoltaics

Green roofs are cooler in temperature and that comes into use. The panels that convert solar energy into energy people can use, are most efficient in certain temperature ranges. Building a green roof and then having the panels on the roof will keep the temperatures in check to make sure that they panels are working at their best.

Public Education

Finally, the green roof can provide education to the public. It can educate the public about the environmental benefits that it provides. It can serve as a connection to people and the built environment and the perception of the environment ("Benefits," 2011).

Green Walls

Brief History

The first evidence of green walls started in the 17th century AD when the Romans tried to grow grape vines on trellises and on the walls. It was not until the 1920s when another breakthrough in green walls occurred when the garden city movement promoted features in the garden such as pergolas, trellis's, and self-clinging vines. In 1993 the first big application of a trellis panel system is used on a building in California. The following year an indoor wall complete with a bio-filtration system was installed in a building in Toronto, Canada. Japan in 2005, held a enormous Bio Lung exhibit and was held in Aichi, Japan. The feature of the exhibit was a wall included 30 different modular green wall systems that were available in Japan. First day course for Green Wall Design held in 2007 in North America.

Green Wall Systems

Green facades

Green facades are one type of green wall system. It is comprised of climbing or cascading ground cover vegetation, which is trained to cover certain structures. The plants are rooted into the base of the structures, rooftops, or planters. Green facades take 3-5 years to cover the area in which they need to cover. English Ivy is a commonly used plant for this type of green wall system.

Modular Trellis Panel System

The modular trellis panel system is a three-dimensional panel. The panel is made from welded and powder coated galvanized steel wire. The design of the system was to keep the place off of the building. It also keeps the plants very covering spaces that do not need to be covered. The system gives the designed the freedom to make the plants grow in interesting shapes creating an attractive, bold design. The panels can also be free standing ("Green roof types").

("Materials, part issue-landscape," 2012)

(Ludeman, 2008)

Cable and Wire-Rope Net Systems

The cable and wire is just that. Cable or wire-rope is made into a net. The cables are used for faster growing climbing plants that have denser foliage. The wire-rope nets are used for slower growing plants because the intervals are closer. These are also more flexible and provide more design options then the cables do. Both of the systems can be of numerous sizes and can be vertical or horizontal.

Living walls

Living walls are different from the other systems mentioned because the systems is composed of panels that are already planted. The planted panels can also be vertical modules or planted blankets that are secure vertically to the wall or a frame. The different materials the panels can be made out of are synthetic fabric, clay, metal, and concrete. The density of the plants more maintenance is required such as supplying the plants with nutrients.

("Green wall projects," 2012)

Modular Living Wall

The modular living wall uses green roof technology and flips it vertical end. Square or rectangle panels hold the growing medium that supports the vegetation growing on it. Depending on the plants, the growing medium is made to suit. The irrigation system uses gravity to move the water. The panels are pre grown, so when the panels are assembled the wall is instantly green. Another type of wall is the vegetated mat wall ("Green roof types").

Vegetated Mat Wall

The mat wall is made of two layers of fabric that have pockets that support the plants and the growing media. The mats are braced by a frame and between the building and the fabric is a waterproof material. Nutrients flow through the irrigation system, which flows from the top and trickles down to the bottom and then cycles to the top.

Biofiltration

The process of biofiltration is simply a living wall that is incorporated into the infrastructure and used to bio filter indoor air. It is essentially a hydroponic system that has nutrient rich water that is cycled through again. The roots of the plants are between two layers of fabric. The roots then can harbor microbes that remove the volatile organic compounds, carbon monoxide, and carbon dioxide. The air is then sucked through a fan that brings the clean air back into the building.

Landscape Walls

The walls are sloped instead of vertical. The wall is made from a material that can be stacked, usually made of plastic or concrete. The purpose of the wall is for slope stabilization and noise reduction ("Green roof types").

Benefits of Living Walls and Green Facades

The walls and facades can absorb carbon oxides and heavy metal particles.
The living walls can also shade and screen the buildings that they are on.
Improved Exterior Air Quality
Aesthetic improvement
Reduced Urban Heat Island effect

Benefits to the building
More Energy efficient
Protection
Improved indoor air quality
Reduces noise
LEED
Increased Biodiversity ("Green roof types").

Hydroponics
History
Hydroponics can be traced all the way back to the Hanging Gardens of Babylon. The system that they developed was growing food in rafts in shallow lakes. In Europe hydroponics did not emerge until 1699 when Woodward found out that a person could grow plants in water that previously had soil in it. A German scientist then started to study nutrient solutions in relation to the nutritional necessities of plants.
Research continued into through the 1870's, finally by 1925 progress towards hydroponics in the green house industry were being made. In 1930 the first hydroponic until was produced for commercial use in America. During the Second World War the armed forces of America were using hydroponics to grow vegetables. Doctor Alan Cooper improved the nutritional formula, which made more plants available to grow hydroponically in the 1970s ("Brief History of Hydroponics").

Benefits of Hydroponics
The benefits between soil and hydroponics are that the grower has complete control over nutrient balance, the pH is simple to keep track of, deduction of soil pests and diseases. Lastly concentrated feeding of the plants reduces water waste. Not only are hydroponics different than soil grown, but they also have environmental benefits as well ("Brief History of Hydroponics").

Historical Context

History of Urban Agriculture

Introduction to Urban Agriculture

The definition of Urban agriculture is as follows, “Urban agriculture is the practice of cultivating, processing, and distributing food in, or around, a village, town, or city” (5). Urban agriculture has a few subcategories that can be included such as, aquaculture, forestry, animal husbandry, and horticulture. Depending on the community, urban agriculture takes place it can have different contributions. Contributions include generating more income, production of food and for some just for relaxation and recreation.

Urban agriculture is beneficial to a community because it contributes to food safety and food security. It does this by increasing the amount of food available to the people in the community and also provides fresh food. By producing fresh food in the city it promotes energy-saving.

History

From 1893 to 1897 there was a great depression that caused many to lose money and their jobs (Williamson). Because of this the demand for community gardens rose during this time period. In Detroit, Michigan, the mayor asked the people who owned vacant lots if they could let the people who had lost their jobs grow food on them. They did and now this time period is forever known as Potato Patches named after the lots that where named Pingree’s Potato Patches after the Mayor.

During this period the city only invested $3,000 in the garden program. In the first year alone the worth of the vegetables that were harvested was $12,000. The number of people that partook in the garden program was 2,000 (Warman). Not only did the gardens give people healthy food to eat during desperate times, but it also made them feel useful and hopeful, and have self-respect, independence, and self-reliance. There were many benefits that the gardens had on people. People who would tend the gardens would get fresh air, exercise, and save financially. The immigrants that would come to work in the gardens would socialize and would learn the “American way” more quickly (A Brief History of Urban Garden Programs in the U.S).

City Beautiful Movement 1860-1910

During the City Beautiful Movement the U.S. population tripled from 31.4 million to 9.19 million. Urban settings started to feel over crowed when 46% of the population lived in them. People were living in alleys and overcrowded apartments. The upper class moved out of the city centers to the country. The rail systems and roads aided the upper class to move out into the suburbs.

The City Beautiful Movement was the middle and upper class response to dealing with the over-population, sanitation, and crime. Two things came out of the woodworks of how to deal with the issues, which were consumption and creation of beauty. The middle and upper class thought that these would encourage better feelings about the city, including civic loyalty and moral goodness and would ultimately lower crime rates. When deciding what was going to need work first, they started with backyards and vacant lots were transformed into classic-style parks and promenades. One author, Thomas J. Bassett, believed that the gardens gave teachers and the children the opportunity to learn about them and be outside. Garden club's started to surface from this movement. So much produce was being grown in the garden that grocery stores started to sell the produce for the people. Benefits that surrounded the garden that they improved health, saved people money, provided rest from tensions of urban life and shaped perception of growing vegetables in cites (A Brief History of Urban Garden Programs in the U.S).

P10.

Children's School Garden Movement 1890's-1920's

The very first school garden open at Putnam School in Boston in 1891. Women's clubs, gardening clubs, and civic clubs supported the teachers with funding when they would decide to have a garden at the school. The United States Bureau of Education established the Division of Home and School Gardening to promote gardens nationally. The division hoped the school districts would incorporate gardening into the curriculum. When World War I came into American's live's the Division of Home and School Gardening, was renamed the U.S. School Garden Army. After the, war though, the movement dwindled and ended. Some Individual school gardens did continue though.

First World War Liberty Gardens 1917-1919

During World War I and II gardening was a patriotic thing to do. Throughout the First World War Europe had some serious issues with producing enough food for everyone who was fighting in the war. Most of the farmers left and went off to war. In the summer of 1914 crops ripened and some never were harvested. Most of Europe was a war zone and made it impossible to farm. Shipping food was difficult as well. North America decided to take the burden and provide food for 120,000,000 people on the allied side.

During this time food production in Europe was struggling. Dairy was even rationed and one could only get it by going to the doctor and getting it prescribed. The U.S. during this time was not participating in the war and but had to cut back on consumption. Prices increased dramatically on butter, eggs, and coffee. Cuts in consumption in meat and wheat were done as well. Community gardens started to spring up everywhere. In 1917 Charles Lathrop Pack founded the National War Garden Commission. Posters, cartoons, press releases, and pamphlets tried to instill American pride, by gardening. The campaign was to put the people who were idle to work by teaching them how to garden and also to educate them how to preserve food by canning and drying. Slogans that were being used were, “Will you have a part in victory,” every war garden a peace plant, and “Sow the Seeds of Victory.”

The US Department of Agriculture made a committee that would help plant backyard and vacant lot gardens. Not only would the victory gardens would help feed Americans but also people overseas. Also with the victory gardens, transportation costs would be cut because fresh food was right in people’s backyards.
The massive gardening movement during this time into perspective, data was collected at the time, in Dallas in 1918 there were 20,000 gardens. Those same gardens produced over 18,500 of produce in a few weeks. In a town that had just fewer than 30,000 people had 14,081 gardens.
In 1917 there were 3 million garden plots in one year that number increased by 5,285,000 plots.
When the war ended in 1919 the gardens declined. Many kept their gardens and would keep using them during the second Victory Garden Movement during World War II (A Brief History of Urban Garden Programs in the U.S).

P10.

Depression Relief Gardens: 1929-1939

Depression hit the U.S. in 1929 and lasted till 1939. It left hundreds of thousand without work and in very serious financial trouble. City governments decided to put in relief gardening programs to help with hungry, emotional stress, and poverty stricken nation, much like the potato patches in the 1890's. The gardens once again had the same benefits to the community. Feelings of usefulness, importance, and productivity rang throughout the communities with the gardens.

Before the gardens were successful there was a lot of turmoil. Organizers of the gardens argued over things like plot sizes, should the garden have one large plot or smaller plots and, where would the plots be? Many people wondered if the garden were necessary, because none knew how long the depression was going to last. A couple of organizations came out during the depression and they were the Family Welfare Society and the Employment Relief Commission. These non-governmental organizations also organized food plots to help with hunger. If people had land, they were encouraged to cultivate it and seeds and supplies were given to working gardens.

Hope came in the form of Franklin Delano Roosevelt when we became president in 1933. The Federal Emergency Relief Administration gave out three billion dollars to the gardens. The people who gardened were paid and distributed food to people in need. The program only lasted until 1935. In New York City the Works Progress Administration helped form 5,000 gardens and in these gardens $5 worth of produce for every dollar invested. The total worth of the food that came from the gardens was 2.8 million by 1934.

When 1935 came around the government started cutting the relief garden programs. The gardening program was no longer viewed as opportunities for improvement of life and success. The kitchen gardens returned to what they were viewed as which was a method of coping with people who were poor and lazy, elderly, and disabled. A name shift took place, from relief gardens to welfare gardens. Because the gardens were a success in the early 1930's people were more open to the idea of the victory garden in World War II. (A Brief History of Urban Garden Programs in the U.S).

P10.

World War II: Victory gardens the second time around..

Gardens started to reemerge, some of the gardens came from the first world war, some from the relief gardens, and many were starting up for the first time. This time was different though because the War Food Administration created the Nation Victory Garden Program which established five main goals and those goals were:

1. Lessen the demand on commercial vegetable supplies and thus make more available to the Armed Forces and lend-lease programs.
2. Reduce the demand on strategic materials use in food processing and canning.
3. Ease the burden on railroads transporting war munitions by releasing produce carriers.
4. Maintain the vitality and morals of Americans on the home front through the production of nutritious vegetable outdoors.
5. Preserve fruit and vegetables for future use when shortages might become worse.

The gardens were now geared towards everyone. Gardening became popular once again, not only because of food security, but for physical health, mental health, and benefits to the community. The plots started to feel more fruitful, vital, and valuable then just another vacant lawn or lot. By 1942 5.5 gardeners were participating in the war garden effort. Seed package sales rose 300%. 9-10 million pounds of fruit vegetables were grown a year and 44% of that came from the United States. Interesting fact from the ear was that 315,000 pressure cookers were sold in 1943 which was up from 66,000 in 1942.

Victory gardens during this time period was considered to be trendy, but once the war was over many stopped gardening and returned to normal life. Then the baby boomer era started. But Urban Agriculture was no lost ("History of Urban Agriculture History").

Community Gardens: 1970-present

Today people want to be more proactive and gravitate towards environmentally friendly activities. Garden programs are starting to reemerge. In New York there's the Green Guerillas and Boston Urban Gardeners (BUG). In 1978 the Urban Gardening Program established administrative centers to encourage vegetable gardening and community gardens in 16 cities and now serving 23 cities. A non-profit, American Community Gardening Association was formed in 1978. In the 80's people started increase the want for land, outreach, and education ("History of Urban Agriculture History").

Today's Community Garden Faces

Neighborhood Community Gardens
Special Constituency Garden Programs
Entrepreneurial/job Training Programs
Environmental Education
Children's Gardens
Public housing Gardens
Community Revitalization
Urban Oasis
Artists Expression

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Gardens are a Place

Options for gardens from least secure to most
Borrowed land either from public or private
Short-term lease
Long-term lease
Public recreation
Owned by a local group or land trust ("*A Brief History of Urban Garden Programs in the United States*")

Who farms in the City?

If you have herbs in your kitchen window, a community garden plot, sell vegetables, you are an urban farmer. There are many other things you could be doing now and still be considered an urban farmer. But why do people want to farm in the city?
Reasons why people want to have farms in the city is for a source of income, food, better nutrition, local food, to be outside, supplement income, business, use the resources that cites have, green up the city, and to create a community.

Benefits associated with urban garden programs and community gardens?
Connection with nature, physical exercise, teamwork, continuing cultural traditions, income generation, empowerment, environmental education, health and nutrition, self-esteem, personal growth and many more!

What does it take to sustain an urban garden program?
Planning design and public support, building the garden knowledge, material, and labor. Participation and stewardship, programming and associated resources to sustain it. Ongoing outreach and management ("Brownfields to greenfields: Producing food in North American Cities").

Case Studies

Case Study: Rainer Vista Neighborhood Community Gardens
Location: Seattle, Washington
Rainier Vista Neighborhood

History of the neighborhood:

The first community garden developed in the Rainier Vista Neighborhood was in 1991. The garden had 12 small plots, which were assigned to residents. Another larger site that was started at the same time as the other one was a community supported agriculture project. The project generated income for the gardeners from selling the produce. The two sites where located around the 482-unit Rainier Vista apartment complex. The apartments have a long history of being a trouble spot with Seattle Police with high crime, drug, and gang activity. The gardens partners were the Rainier Vista Apartments, the City of Seattle, Seattle Housing Authority, and Friends of P-Patch (8).

P-Patch is a program that consists of staff, volunteers, P-Patch Trust, Seattle Housing Authority, and other agencies. Volunteers coordinate activities and tasks that take place in the P-Patch gardens. Essentially P-Patches are open spaces that are a resource for all member of the community. From Seattle.gov on the P-Patch Community Gardening Program, "…places to share love of gardening, cultivate friendships, strengthen neighborhoods, increase self-reliance, wildlife habitat, and foster environmental awareness, relieve hunger, improve nutrition, and enjoy recreational and therapeutic opportunities"

In 1995 the neighborhood residents decided that more community gardens were needed to build relationships between recent immigrates from Cambodia, Vietnam and East Africa. 1995-1997, additional sites were added to the community garden system and a fourth was added in 1998.

The key people in the development of the community gardens in the neighborhood are: Friend of P-Patch, the residents, City of Seattle, Seattle Housing Authority, Southeast District Neighbors, Local Foundations, and Businesses. Without these people the community gardens could not be a reality.

In 1998 the residents had 50 individual plots to garden. The average square footage is 120 on four sites. A fifth garden is planned to be near the Child Care Center to supply fresh vegetables for the children's lunches. The parents would help maintain and develop the garden. Not only are there more gardens being planned but also larger gardens ("P-patch community gardening program").

The larger gardens started in the neighborhood in 1997, which would coincide with the City's Cultivating Communities Program. Rainier Vista introduced its Community Supported Agriculture project. The difference between this garden project and the smaller ones was that these were urban mini-farms, which are designed to sell produce for profit.

The Sunrise Garden was created on unused land from the Seattle Housing Authority behind a complex they owned. The area was doubled to 1.5 acres and three Vietnamese families farm the garden. Around 24 families pay for the produce at $350 a year. The families come to the farm and pick up shopping bags full of produce every Saturday. The harvest is so abundant that families, who take the produce home, often share with others. Extra produce that was not bagged up for the 24 families the gardeners sell their produce at a local farmer's market. In 1998 each gardener earned $2,000-$4,000.

The community gardens that have been built have proved beneficial to the community. The residents now help each other with child care, and when people fall ill. Because of the gardens people have started to take initiative on greening their neighborhood. New seating area's and flower planting around the gardens have sprung up. People who are involved with the gardens have been educated in recycling, developing organic food sources, and composting. Children also help the adults around the garden. Diets of the residents have improved being of the availability of fresh produce. All of the gardeners grocery bills have declined since the gardens have been in operation. And lastly the residents involved in the Community Support Agriculture program have seen increased income from the larger scale garden (“P-patch community gardening program”).

SEATTLE COMMUNITY FARM AT RAINIER VISTA

LANDSCAPE PLAN

HIGBEE DESIGN STUDIO
LANDSCAPE + ART + COMMUNITY

How this Case Study Applies to my Site:

My site will be located in a low-income, crime filled area of Minneapolis, Minnesota. I want to look at the crime rate of the community, as well as the income, living situation, and ethnicity, of the families. From the case study I saw how the community gardens changed the community by providing education on gardening, as well as declining their grocery bills and providing fresh healthy produce.

This case study shows me who is all involved in this particular garden. When I first started this thesis project I was under the impression that community garden where started just by one entity and then the residents took over the gardens. In this case study, the Housing Authority gave the land up for the gardens. The P-Patch program set up the rules and organized the residents. The residents were in charge of the day to day activities in the gardens and also working in the gardens. Also businesses helped with expenses on the garden. I hope to bring in surrounding business to help with the starting costs of the garden. I also plan to get the land from the land owner of under utilized lots in the neighborhood that I decide to place the community gardens.

Another thing I learned from this case study that could be applied to my site, would be that a community garden doesn't only provide affordable fresh healthy food, but it also builds relationships within the community. Like small towns when people grow produces and share it with their neighborhoods, this is what happens in larger cities as well. Community gardens bring a sense of community to a neighborhood that has seen some hard times.

The community garden also involved at risk youth, and I would love to have the at risk youth involved in this garden so they can learn about team work and how to communicate between on another. I would like them to be a part of the building process of the garden. I want them to build the sheds, greenhouse, and the raised garden beds. In the reading, Growing a Garden and a Community there was a paragraph about the youth that helped in building the community garden. Because the youth where involved and the adults where hard at work in the gardens, the sheds remained unlocked. I want to bring that sense of security to the community where I will be designing three community gardens in.

The case study was very helpful with the larger community garden, and how it was run. I want to use the concept of the larger community garden being more that people pay in to the gardeners and the gardeners provide them their share of the food and produce additional income for their families.

Case study Roof Garden
Rooftop Haven for Urban Agriculture, Chicago USA
The Gary Corner Youth Center

8,160 Square Foot garden grow 1,000 pounds of organic food. The food went to local café's, restaurants, and students. The garden is maintained by the students in an after school programs. The senior citizens in the area also come to learn and maintain the garden as well. The garden won an honor award by the American Society of Landscape Architects.

The garden has a flower garden with the vegetable garden. The center was suggested to hire a master gardener to manager the program associated with the garden as well as delegate tasks for maintaining the garden.
The soil on the roof is 18-24 inches deep, which is just right for practical food production. Some of the vegetables grown in the garden are: strawberries, lettuce, cabbage, potatoes, and sunflowers. Since the garden is on the roof it can be used throughout the winter months as well. The garden which is very young, was only built three years ago, but like any garden has been changing over the years.

The rooftop garden is surrounded by glass that is floor to ceiling. The children when they are playing in the gym, or sitting in a class room can look out into the garden to see the produce mature.
The pathways inside of the garden are made from recycled milk containers. The metal circles that are throughout the design are both art and skylights for the floors below the garden, which is right above the gym and the café.

The people associated with this garden were two landscape architects, two architects, one structural engineering firm, one garden manager, a irrigation designer, a landscape contractor and a general contractor company ("Rooftop haven for urban agriculture").

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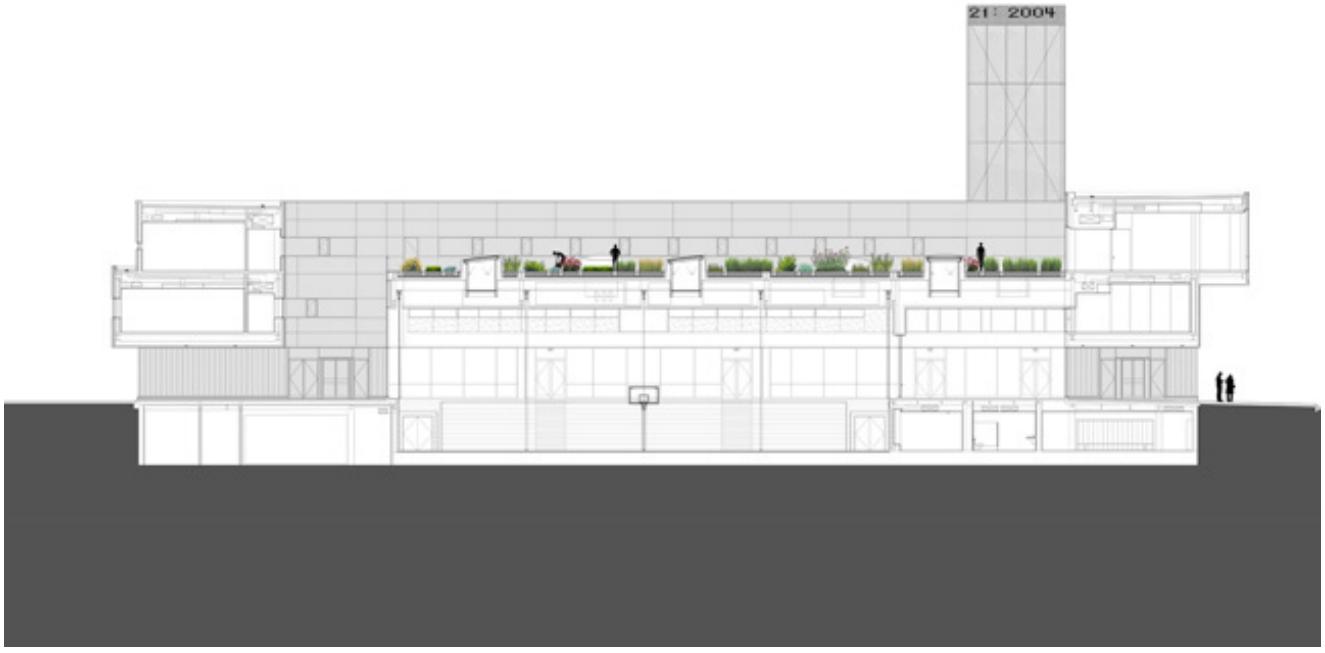

Why this is Relevant to my Project

The project mentioned above was from an existing building, built because the people at the Youth center wanted to educate the students on food security, and to grow food. Not only does it teach the children those skills, but it also keeps them busy after school, and keeps them out of trouble. This is the same principle I would like to explore. The neighborhood that my community garden system will take place has part of the University of Minnesota. Students like to live near campus. So what better place to put a garden, were students and residents can come together and grow food and have healthy food.

Another thing that applies to my site is the fact the students grew the food, but some of the food was given to restaurants and cafe's. Site 2 is where the rooftop garden will be located. Near there is a college, hospital, and restaurants. All of these can benefit from the produce from the roofs.

The aspect of the construction of the roof will come in handy when creating a construction document, for the rooftop. I know how much soil to add to the roof to support vegetables and flowers if I wan to include them.

Vertical Garden, Living Wall Case Study

In **San Diego, California** a man by the name of Mario Batai wanted fresh produce in the back of his restaurants, and decided he wanted a garden. The garden would be between osteria Mozza and Pizzeria Mozza. He didn't want something conventional, so he turned Jim Mumford, owner of Good Earth Plant and Flower Company to help.
Mumford has a reputation in San Diego with creating unconventional gardens. One of his projects include a 1,800 square foot rooftop garden that included 3 inches of soil onto of padded waterproofing and drainage system. Boulders, 46 different kind of plants, and fake boulders are also part of the design.
When the word got out about this rooftop garden people started demanding having him design a vegetable garden on the roof. He wanted to design it, but it just was not practical. He told the CNN Money that "You would need to either harness yourself or build a 42-inch wall around the edge so you don't fall off while working there," Also a vegetable garden requires more soil and water, so now you have weights issues, too."
The idea of growing food on a vertical plane was something that Jim Mumford could do, and he did.
The idea that restaurants who wanted their own gardens did not have the room horizontally to build a garden, because the idea of locally grown produce is a hot topic these days.
Mumford now crates edible walls from boxes that look like milk crates. The box's measures two square feet and 8 inches deep.

Many may ask how he takes this box and flips it so the produce grows against a wall? What Mumford does it take fabric, cuts holes into it and pushes the seeds into the soil. After 8 weeks the plants are mounted on a rack and put onto the side of a building.
The charge for one square foot is $50 and between $150-$200 for a commercial grade system

The system has made Jim Mumford just over one million dollars. Because of the economy things have slowed, but some of his clients have been places like Qualcomm. They want a green wall in the cafeteria.
Mario Batali is one of Mumford's clients who wants a wall that is 72 square feet. 324 plants will be included in the wall. Most of the plants will be herbs like rosemary and mint. But Mumford also included beets. Both for the beet's colored leaves and for consumption.
Batali is very pleased with the living wall, he was quotes as saying to CNN Money, "It's edible, all delicious and most significantly, all very beautiful. And it smells really good, too." ("Walls you can eat.").

Why this is Relevant to my Project

It took a long time to finally find an edible vegetative wall. The case study that was just mentioned is very good for the thesis project. It shows that one person's invention can impact people on a larger scale. The idea of community gardens is just that. It takes one person to start the idea, and then that person tells another, and before you know it there is a network of very successful community gardens in the area.

The case study was also very helpful and relevant to Urban Agriculture in that vertical gardening is a very new concept and that Mumford was hoping that it would take off. The exterior of building can now just be more then just walls, they can now help with food security, bring healthy food into low income area's, educate the public on different ways to grow food, and many more.

For a smaller green wall, I can use this method of growing vegetables. Site 1 could use this system for growing produce. The people that maintain the wall and harvest, will get a close up experience with the living wall with replacing the milk crates, planting, and reattaching the system to the wall.

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Summary of Case Studies

When deciding on which case studies to look at I decided to take three different case studies to make the thesis project well rounded. The first case study is in Seattle that was started by P-Patch. The second is a roof top garden that is on top of the Gary Youth Center which is part of an after school program to teach children how to grow their own food. Lastly the final case study is on a man who developed a vertical wall system for growing produce. All three of the case studies have expanded my knowledge about the urban agriculture. The Seattle, Washington garden taught me about the importance of multiple people getting together and starting up gardens.

Seattle Washington, P-Patch, the City, Seattle Housing Authority, Southeast District Neighbors, local foundations, and local businesses all came together an produced an urban agriculture system throughout the a neighborhood. Over the course of 5 years 4 gardens were up and producing food. All of the gardens were different some large and some small. The gardens brought people together and provided them healthy food. The case study taught me a lot of about all of the people involved in urban agriculture. The next case study involved just the youth of the community.

The Gary Corner Youth Center at 8,160 square feet can grow 1,000 pounds of food. The food goes to local cafes, restaurants, and the students. Along with growing vegetables the garden also has sections for flowers. Again this case study had multiple people working on it to make it a reality. The garden has pathways and skylights that doubled as art. The thing that I learned while reading through the case study is that the garden was located in Chicago, but could be used all year long because it was on the rooftop. The next case study was more to look at the mechanic's behind vertical walls and that one person can make a difference.

In San Diego, California Jim Mumford was a visionary. After completing a rooftop garden, people demanded that he create a vegetable garden on the roof. Wanting to help, he created a vertical growing system to satisfy the needs of his clients. He took milk crates, put soil into them, placed plastic over it, cut holes, planted the vegetables and, then after 8 weeks mounted the system to the wall. The case study will help with the thesis by seeing the power of one. One person can create a technology that can be used by everyone. Also the system is simple so that anyone can use it. The case studies were relevant to my thesis in more ways than one.

The case studies were relevant to urban agriculture in rooftop gardening, living walls, and seeing a community garden system grown and help the community by providing healthy food and brought them together. From Seattle, Washington, San Diego California, and Chicago, Illinois had impressive case studies that were relevant to urban agriculture.

Site Analysis

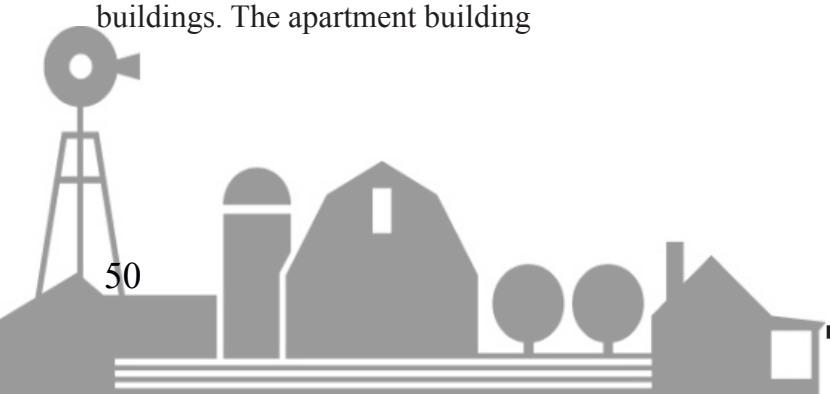
Narrative

The Cedar Riverside neighborhood is a low income neighborhood with no access to fresh healthy food. The University of Minnesota is partially in the neighborhood also the Augsburg College is in the neighborhood as well. The hospital, Cedar Riverside People's Center is located in the North West corner of the neighborhood. The neighborhood is very diverse and full of colorful people. The colleges in the neighborhood and the diverse neighborhood create the perfect opportunity to bring in the latest technology for growing food.

Community gardens have started to become popular again because of the economy and people needing to save money. Traditional gardens have been horizontal and on the ground. Today technology has pushed the tradition and started to grow plants in hydroponics, vertically, and on rooftops. The design is going to emphasize the new technologies.

The design entails three sites, where the new community gardens will be located. The first site in the serious of gardens is located on Cedar Avenue between 7th South Street, and South 6th Street. The first site has a vertical living wall and small traditional horizontal on the ground gardens. There is a bus stop that is on the opposite of building. On the same block as the gardens is a bar, liquor store, café, Korean Service Center, Mediterranean Deli, and Tana Spice and Meat. Near the garden is the Cedar Riverside Community School. The school could have an after school gardening program on the apartment grounds. Every weekend the people who maintain the garden and pay in will get a bag or two of fresh healthy produce. Whatever is leftover will be sold at the proposed neighborhood farmers market. It is one block north of the Community Peace Gardens. To get to them someone has to go across the interstate. The location of this new garden is more convenient to the Cedar Riverside community.

The second design is located on Riverside Avenue between 20th Avenue South and 21st Avenue South straight across from the dance studio, next to Jimmy John's and the Lutheran Center. The gardens will be place on top of the 4 story apartment building and the two story townhouses. Access to the townhouse gardens will be in the protected courtyard in between the buildings. The apartment building



will have access from inside of the building. The plots will become available first to the people living in the buildings. Then the gardens will be advertised to Jimmy John's and the Lutheran Center for restaurant use, and an after school programs. If plots are still available it will be opened up to the dance school for educating the dancers about eating healthy.

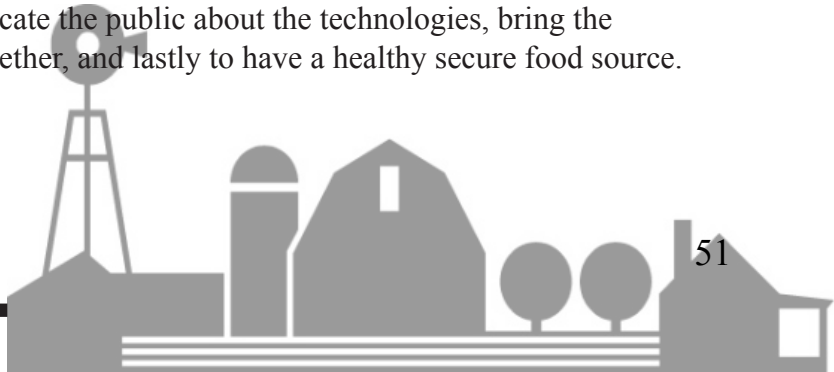
The final garden in the system will be located next to the river at South 8th street and 27th Avenue South. It is two blocks east of the Fairview Orthopedic Clinic. Currently the site has a tennis court and playground. The site will be transformed into an Urban Agriculture plot. The site will consist of an orchard, smaller plots for individuals, and a large plot for a few families to come together and farm it. The garden will be tailored for people with all kinds of abilities. The garden will have plots that are raised for people in wheel chairs and the elderly. The site will also have a gathering area, and small area to sell the extra produce. There will be two master gardens for this garden as well as a program director to hold classes for the public. During the winter time Minneapolis is covered in snow and too cold to support growing produce. On site there will be a greenhouse that using hydroponics to grow the produce. The garden will take water from the river to water it.

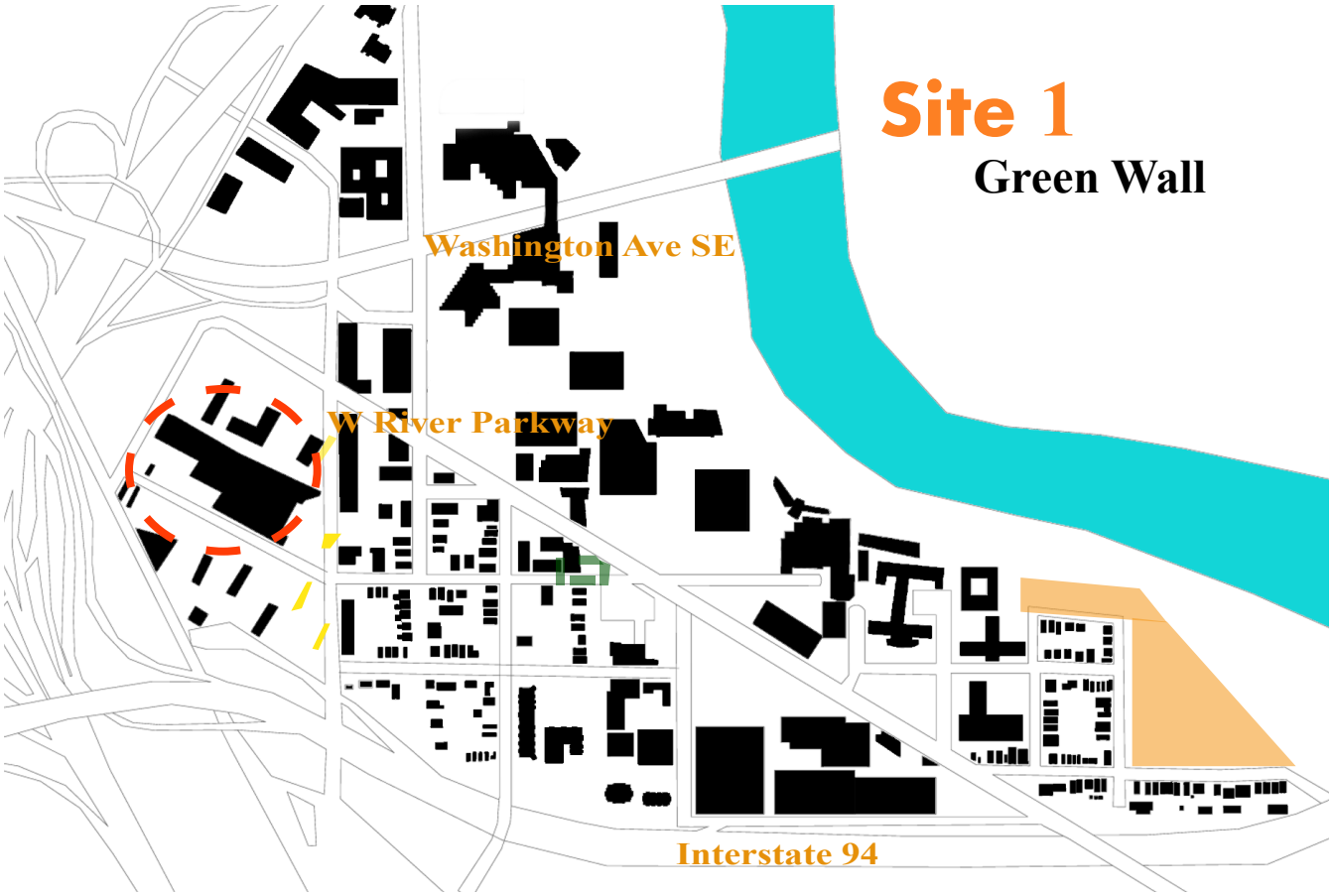
The goal of the gardens is to educate people about the technologies that are incorporated into the gardens. Each of the gardens will have a master gardener and program director unless otherwise stated above. The Gardens will have a kiosk that explains the technology as well as the program director will be organizing education workshops.

The second goal for the gardens is to bring the community together. The community is very ethnically diverse. Near the colleges and hospitals there is an array of people that live in Cedar Riverside. By working side by side in the garden and hanging out the neighborhood will start to create bonds.

The last and final goal is to bring healthy secure food into the neighborhood. To the south there is the Peace Community Garden. But that alone cannot serve the entire Cedar Riverside Neighborhood. The need for more community garden space is a must. All three sites will bring in more opportunities for all of the members of the neighborhood to have access to healthy food. The larger site will even give the neighborhood the opportunity to have healthy food during the winter months.

The three sites are spread out throughout the neighborhood to be accessible to everyone. The first site is in the south east corner, the second is in the middle, and the largest is in the south west corner of the neighborhood. The sites will educate the public about the technologies, bring the neighborhood together, and lastly to have a healthy secure food source.




Site 1
Green Wall
Washington Ave SE
W River Parkway
Interstate 94

Views

Legend

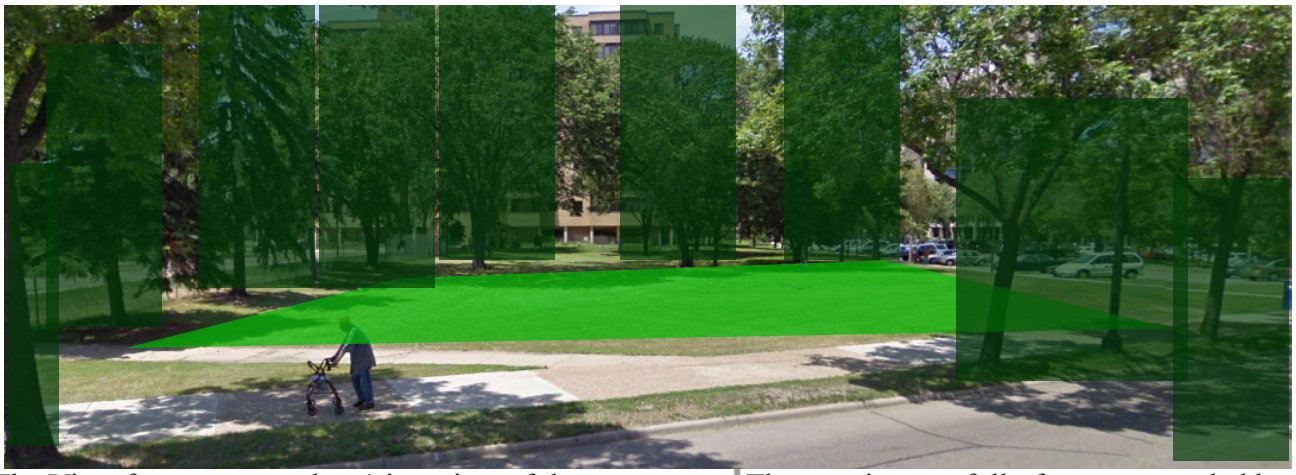
Trees

Parking Low

2

The view from 6th Street South of the building is there are no tree's shading the building so the living wall will get a lot of sun. The topography raise towards the building.

1



The View from area number 1 is a view of the open space. The area is open full of sun surrounded by trees. the Building cannot be seen from Cedar Avenue.

Light Quality

The light green has a high light intensity for more than 50% of the day. The dark green has a light intensity for more then 50% of the day.

Shade more then 50% of the Day
Sun more then 50% of the Day

Wind

N

By looking at the micro climates, One can see where the winter and summer winds will affect which areas. Also the are were the lving wall will be will br protected during the winter.

Area Protected when the wind blows from the south west.

Area Protected when the wind blows from the north east.

Area protected by the wind, unless the wind is coming from the north.

Summer Winds (red arrow) come from the south east.
North winds (blue arrow) come from the north west.

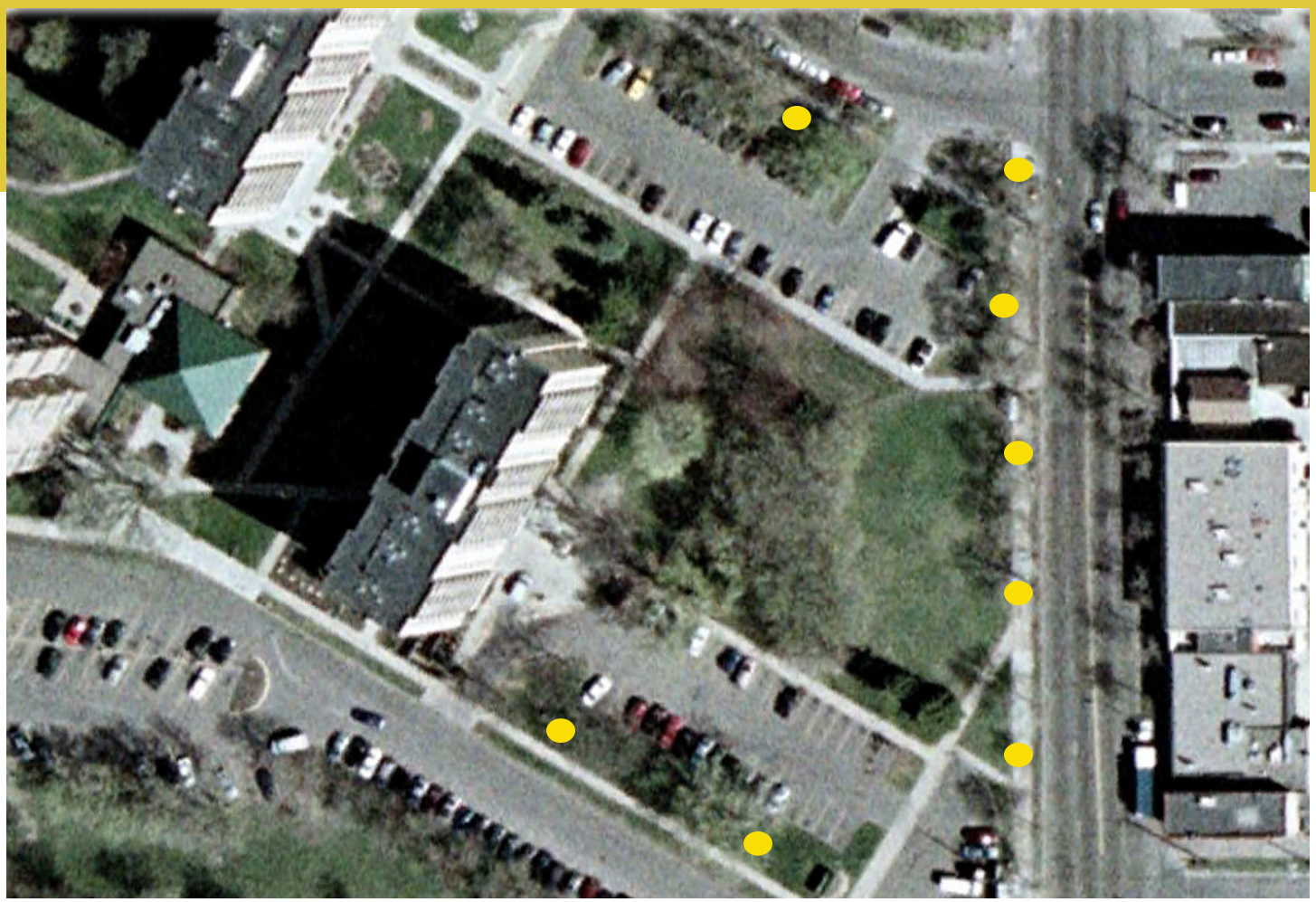
Human Influence

Looks like people have been waling across the front lawn. With the parking lots where it is in relation to the front of the building, it only makes sense that there's a foot path there.
People now use the site to pass through it to get to the apartment building.

Distress

The only distress that is on the site is from human impact and where the green box is. The topography is raise into a hill were the green is. At the top of the hill the grass is not as green.

Utilities



Light Poles

Vehicular Traffic
Pedestrian Traffic

The parking lots are all 80% full. Cars are parked all around the street as well.
The sidewalks are quiet and not very many people use them.

Legend

- Parking Lot
- Major Road
- Minor Road
- * Bus Stop
- Pedestrian Traffic

South facing apartments can sustain a green wall. giving the residents fresh produce close to home.

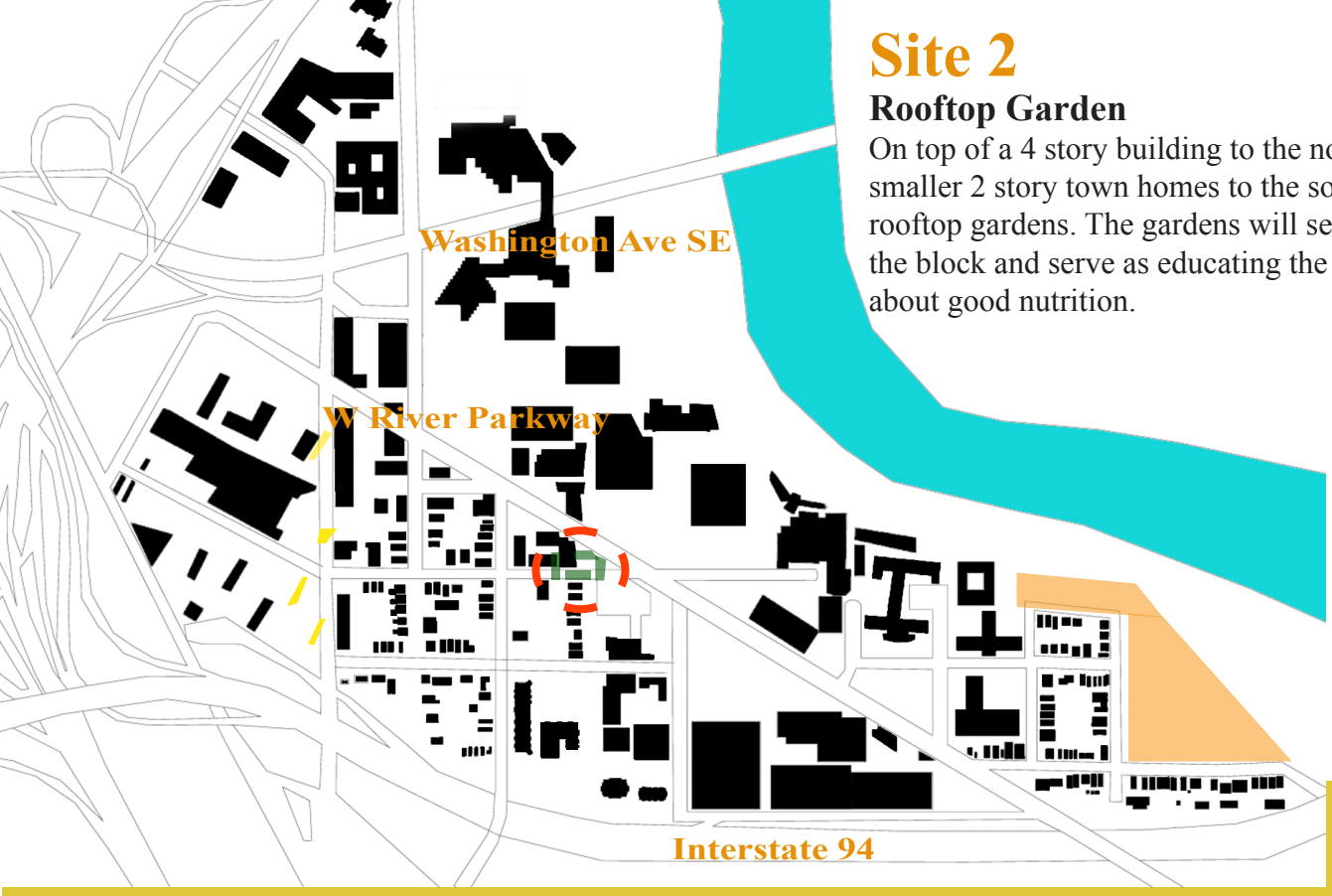
Sun is high enough in the summer to be over the building to the south giving this building maximum light midmorning to mid afternoon, when the light is not as intense.

Challenge

+Establish education about green walls.
+Create a space were people can interact with food and with one another.

This is an anaylsis of the High Rises Across the street.

South East Facing Wall will provide excellent lighting for growing.



Site 2

Rooftop Garden

On top of a 4 story building to the north west side and smaller 2 story town homes to the south west, will be the rooftop gardens. The gardens will serve the residents on the block and serve as educating the dance studio users about good nutrition.

Image from Bing maps

Views

Image from Bing maps

Image from Google Earth

This is a photograph from the ground looking at tone of the buildings that will have the rooftop garden. The view for the rooftop will extend as far as the eye can see unless taller buildings get in the way of the view.

Light Quality

Image from Bing maps

The south building that is only 2 stories, half of the building will be shaded from about 10am-3pm. The temperature on the rooftops will be warmer because of no shade and very intense if not otherwise noted.

Buildings

Image from Bing maps

In this area the building are key because the apartments and townhouses will have the rooftop gardens. People from the dance studio can come up to the gardens to learn about nutritions, and the extra produce can be sold to Jimmy Johns. These gardens will serve the people in the townhouses and apartments primary, and the dance studio and Jimmy Johns secondary.

Wind

Image from Bing maps

In the protected area, there can be access to the gardens from outside. The townhouses are individual unlike the apartments which have a few entrances to multiple apartments. A stairway will be placed in the protected area for access.

Summer Winds (red arrow) come from the south east.
North winds (blue arrow) come from the north west.

Rooftop Gardens

Human Intervention

The only Human's on the roof would be the maintains people, or the roofer's when the roof needs to be replaced.

Distress

The roof appears to in good shape. The building will need to be evaluated to see if it can hold the soil, water, plants, and people that will be on the roof.

Soils

No soil on the roof yet, but there will be with my design.

Utilities

Image from Bing maps

Light poles are only 20 fet high and the light will not reach the tops of the buildings.

Ligth Poles

Vehicular Traffic
Pedestrian Traffic

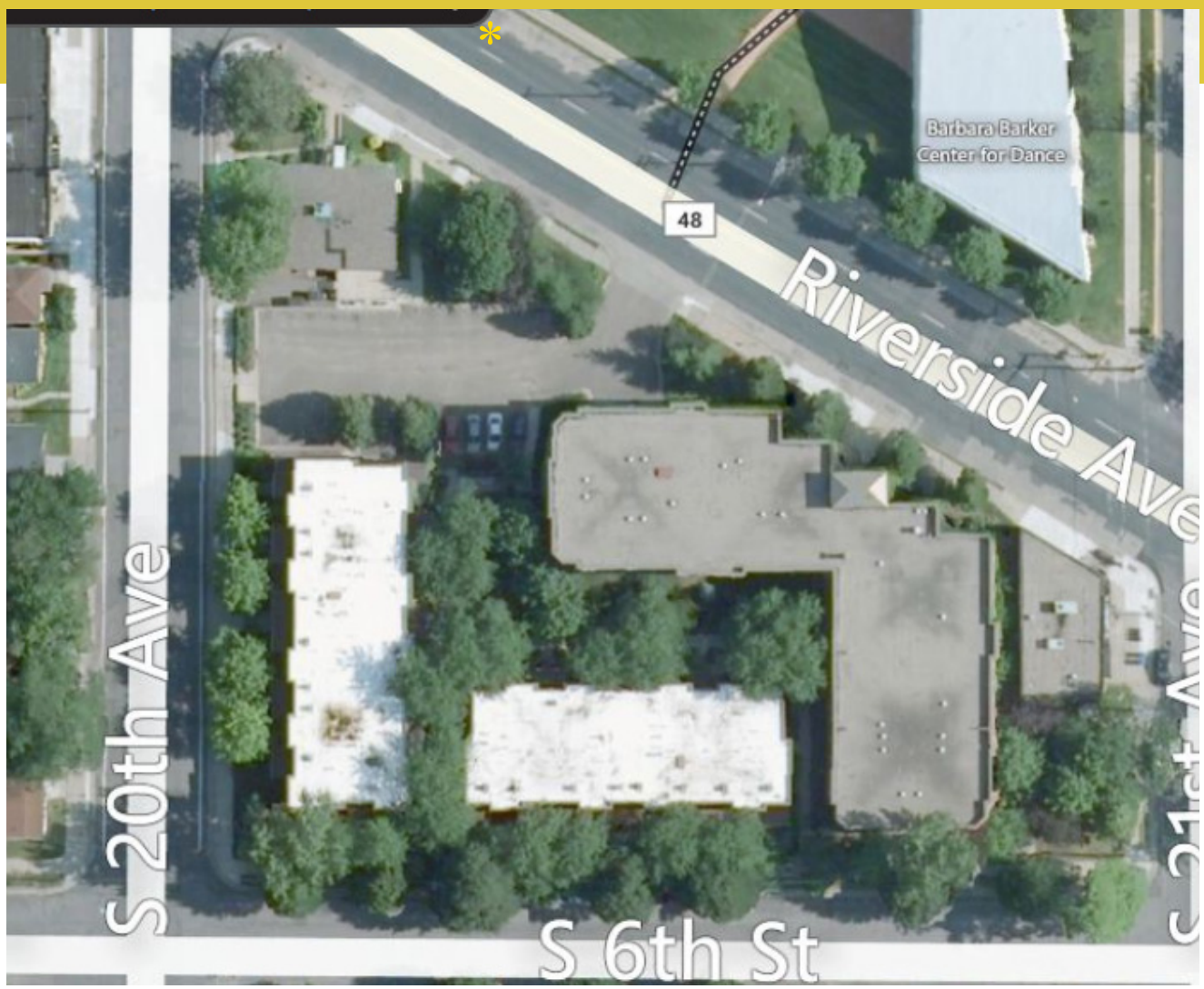


Image from Bing maps

Parking Lot

Major Road

Minor Road

*Bus Stop

Pedestrian Traffic

The one street is very busy, the others are mainly used for parking.

Map

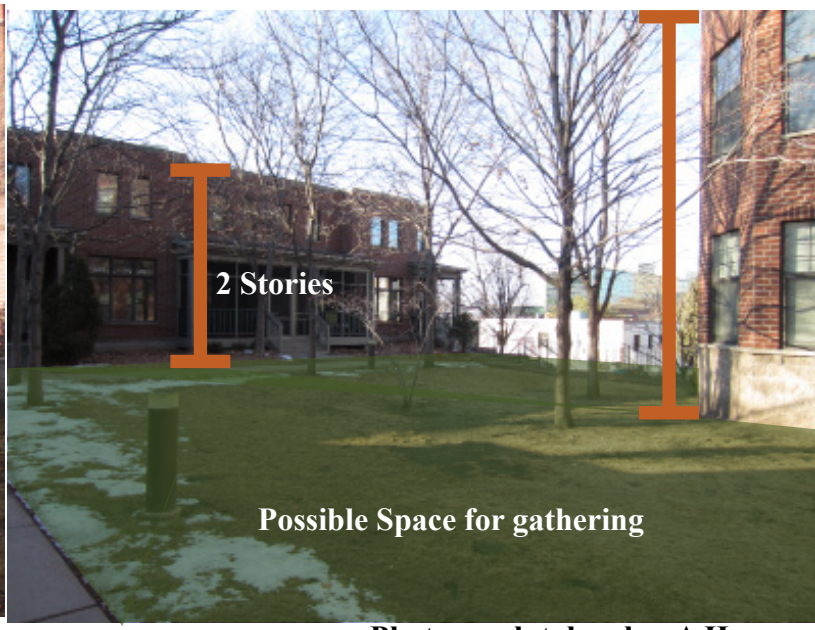
Image from Bing Maps

Trees

Proposed Rooftop Gardens

Existing Site

Photograph taken by: A Hansen



Photograph taken by: A Hansen

Challenge

+Establish a connection between the buildings making it easier to travel between the gardens.

+Provide an educational element about the growing system and food.

+Create a space that not only has food production but can produce year round.

Site 3

Park

This is the largest of the three sites. The main part of the site is a park already with a tennis and basketball court. Since it is right near the river. The river can irrigate the farm.
Here people in the neighborhood can have their own plot or have a large plot with a few people and will sell the extra produce at the farmers market.

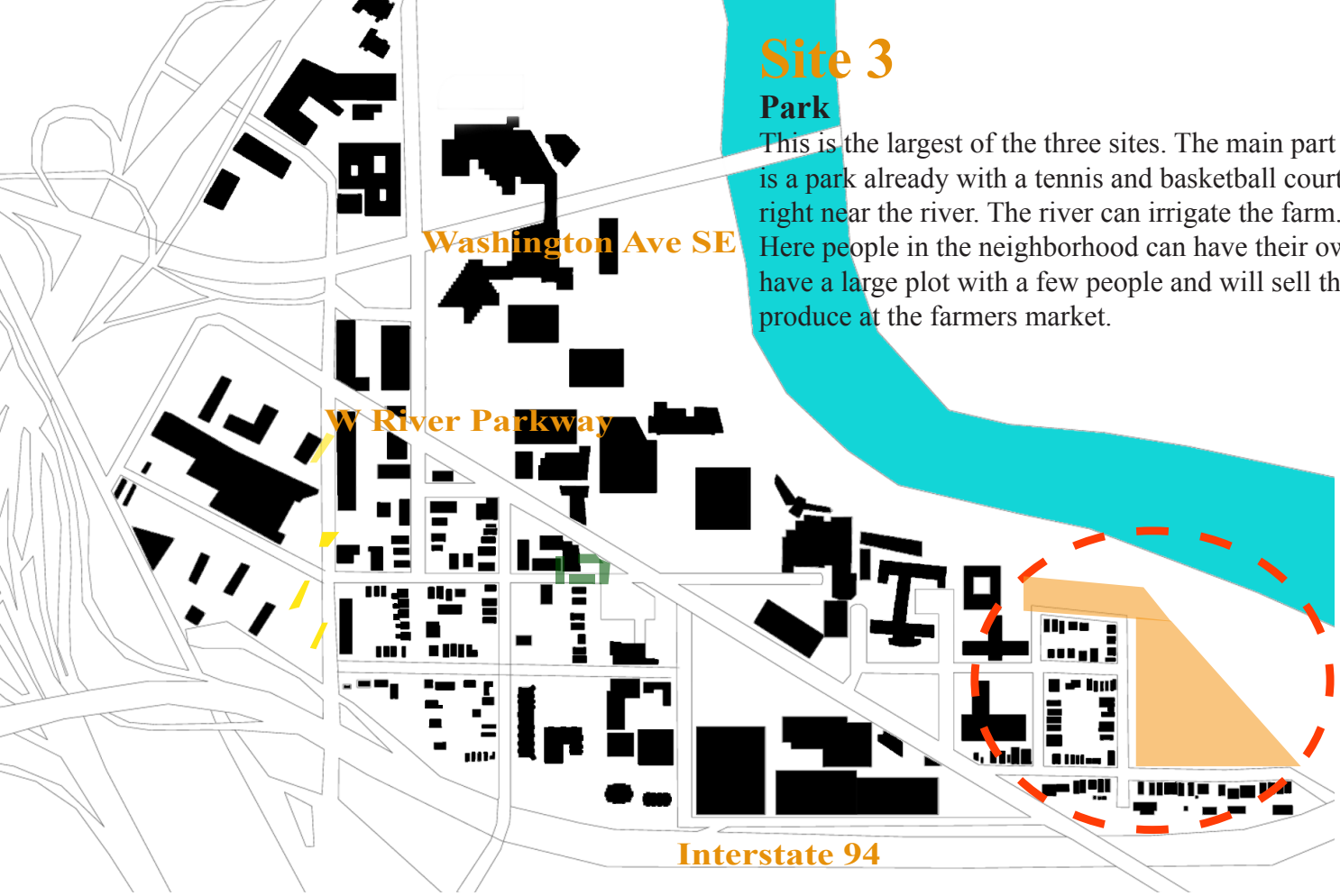


Image from Google Maps

Views

Image from Google Maps

1

Huge open space surrounded by trees.

Image from Google Maps

2

Small Park with playground and pool.

All photos taken from Google unless otherwise noted.

Image from Google Maps

Light Quality

Image from Google Maps

Shade more then 50% of the Day

Sun more then 50% of the Day

Seeing were the sun will be most of the day on the site, will ensure the location of the vegetable garden will thrive.

Wind

Image from Google Maps

The residential area will help block the winter winds. The trees to the south of the site will block the summer winds. In the middle of the site a person might experience the wind exponentially.

Area Protected when the wind blows from the south west.

Area Protected when the wind blows from the north east.

Area protected by the wind, unless the wind is coming from the north.

Summer Winds (red arrow) come from the south east.
North winds (blue arrow) come from the north west.

Human Characteristics

Image from Google Maps

Currently the site is being used a park. The park has a swimming pool, soccer field, tennis court, and a playground. The open space is being used for playing catch and picnics.

Utilities

Image from Google Maps

Light Poles

Light poles light up the street around the park, no light are in the park.

Vehicular Traffic
Pedestrian Traffic

Image from Google Maps

By looking at the pedestrain traffic, there is only one path through the park. The rest is an open field.

Parking Lot

Major Road

Minor Road

*Bus Stop

Pedestrian Traffice

Challenge-when designing the space.

+Work with the existing landscape.
+Provide many kinds of produce.
+Create a space were people can gather for various events.

Existing Site

Photo Taken By: A. Hansen

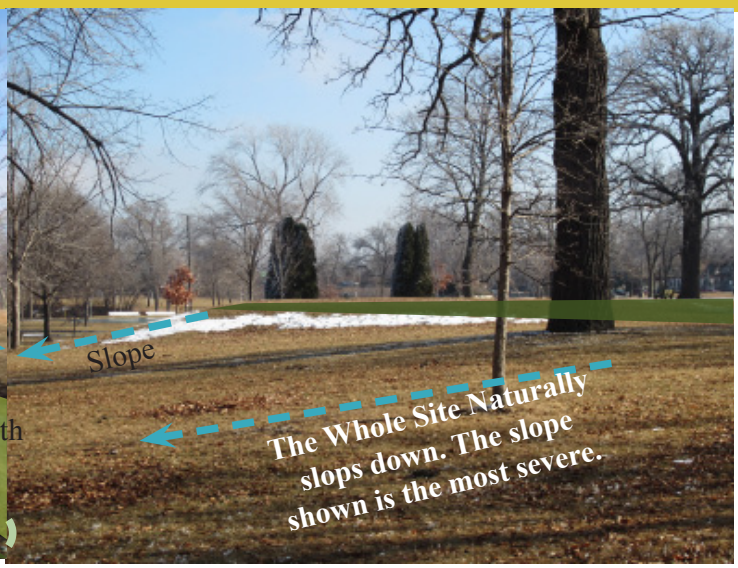


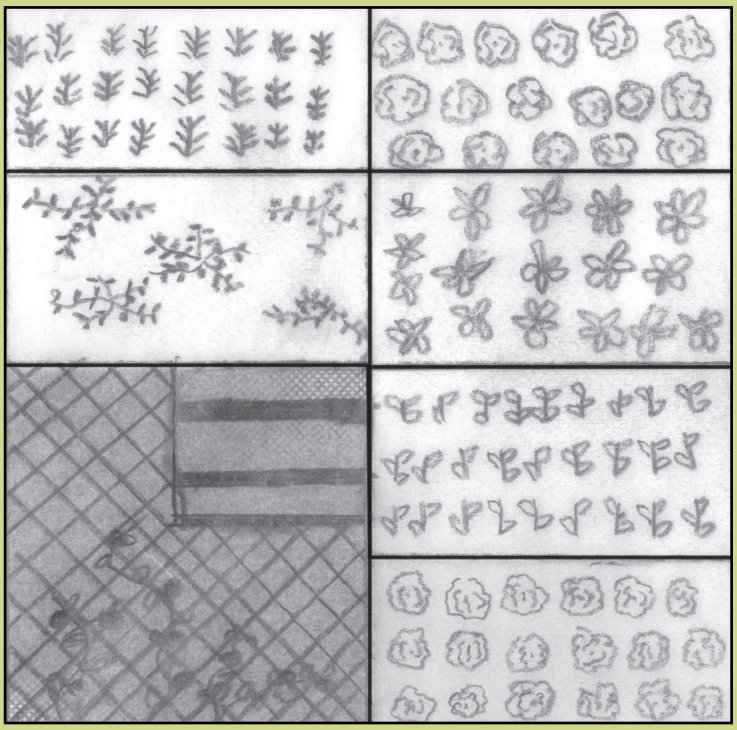
Photo Taken By: A. Hansen

Design Solution

Greenwall

The greenwall system will be on the balconies of the Cedar Riverside High Rise. There will be classes held at the school inbetween the buildings to teach the people how to grow food with the system that they have. The classes will also let people come together and celebrate food.

Green Wall Two Options



Vertical Planter

The above system is growing food in the wall. In the bottom corner will be a lattuce structure to suppost vine growing plants with a shelf for decoratings and tools. The rest is a media that will support plants growing out of the wall. Above is a persective of what the wall could look like.

Horizontal Planter

Will be a typical planted, but people with the system will be taugh how to grow food in a small space. For example grow corn and sunflowers, then train gourds and tomatoes to climb the corn and sunflower and then plant carrots and lettuce on the bottom, utilizing all of the space to it's fullest. Above is a perspective of what the system could look like right before harvest.

Green Wall Space Summer Perspective

The summer perspective shows how much green the walls will bring to the building with the two systems right before harvest. Not only will it be green but one will also see some color from the maturing produce being grown.

Concept Diagrams: Rooftop Oasis

The images to the right are of concepts of the rooftop.

One thing that was interesting to solve was the big apartment building is four stories tall and the townhomes are only two stories tall.

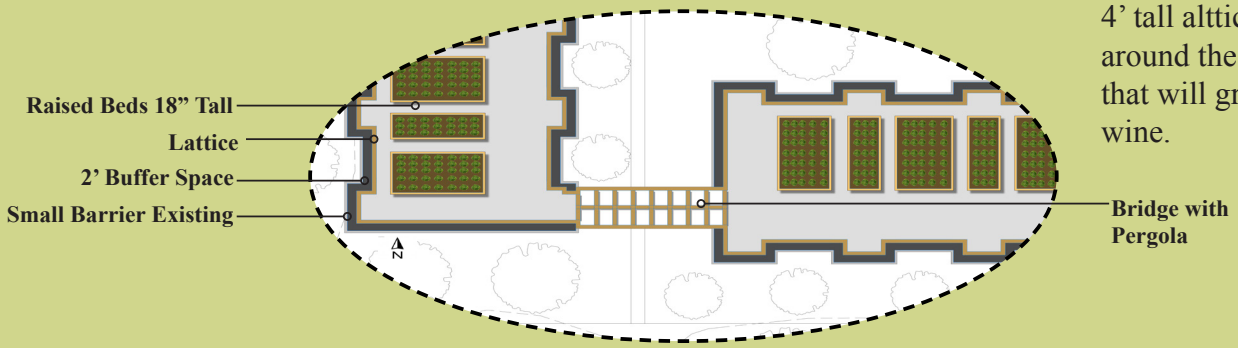
The design needed to have the following: Bidges to connect the buildings somehow to make travel between the buildings easy, green-house space, growing space, and kitchen space. As one can see from the concept diagrams placement of these are different in each one.

A challenge that was faced was where to put bridges and how the bridges were going to look like. Models were made in Sketchup to see the severe slope with some connections.

One concept just didn't fit everything, taking an ideae from one and putting it with another created the master plan for the design.

Rooftop Oasis: Underutilized Roof

Detail: Growing Space



The detail shows the bridge detail with the 4' tall alttice structure around the whole site that will grow grapes for wine.

Looking at the apartment building one would not know if there is anything on top of the roof. But once a person travels into the courtyard between the building they will discover an elevator, which will take them to the roof where they are pleasantly surprised to find a garden full of produce. When they first enter a person will see raised beds with fruit bearing shrubs and trees, beyond that a kitchen area were people can gather and cook. Around the corner a stairway leading to the other garden plots and beyond that a greenhouse for winter food production. A shed is placed on the far end of the garden where tools can be stored. Compost bins are placed throughout the site and the beds are watered through drip irrigation system. The Lutheran center, apartment renters and the dance studio across the street will be responsible for tending the garden. The surrounding community will be able to buy in shares to the garden and will be able to get a bag of food once the garden starts producing.

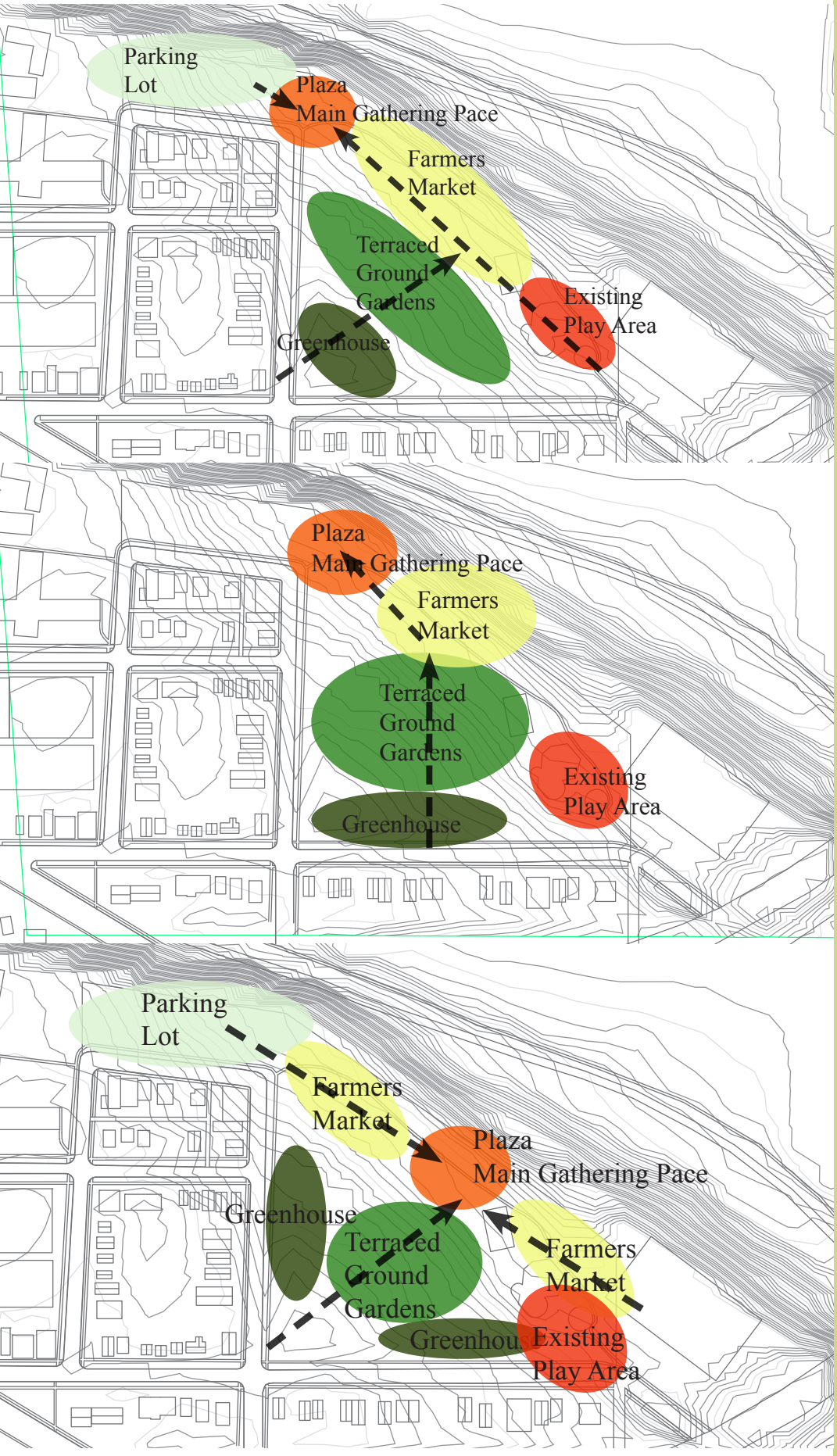
Summer Kitchen Perspective

The perspective shows the kitchen area that has a pergola structure over it to provide shade as well as the raise planters with the fruit bearing trees in them. As well as they are covered in tile that mimics the tile found around the existing site. The counter area has a raised part were herbs will be grown for fresh herbs when cooking. The kitchen area also features 8 burners, sick, and 3 ovens for some serious cooking. Stools surround the counter area for people to sit and enjoy eachother.

Section

The section shows the relationship between the buildings at the different heights as well as the growing area's being accessible with steps un into them as well as benchs in the greenhouse area on the four story apartment building. The section shows how the bridges will be completly enclosed with a lattuce structure with a vine plant growing on them.

Concept Diagrams



The design called for plaza, parking lot, farmers market and greenhouse space. Starting at the south east corner of the site the design needed a plaza bringing people in from the urban environement into the park. With a greenhouse structure to start growing then transition into the growing space and then with the orachard being a transitional space, at the bottom of the will the farmers market to celebrate the food being harvestd. The concepts play with the different spaaces and their locations and sizes.

The concepts also explored the movement of people and whether or not to put a paarking lot into the design.

The final design is a mesh of all three taking the location of the greenhouses of the bottom one, the movement of the top concept and the placement of the orchard, plaza, and farmers market of the middle one.

Open Opportunities

Retention Pond
Will be a place for the parking lot runoff to gather.

Existing Trees
Kept

Farmers Market
Will be open every day of the week, features but not limited to: crafts, food vendors, and live music.

Orchard
Has a variety of apple, pear, apricot, and cherry trees.

Plaza
Space for people to gather and hear live music and eat.

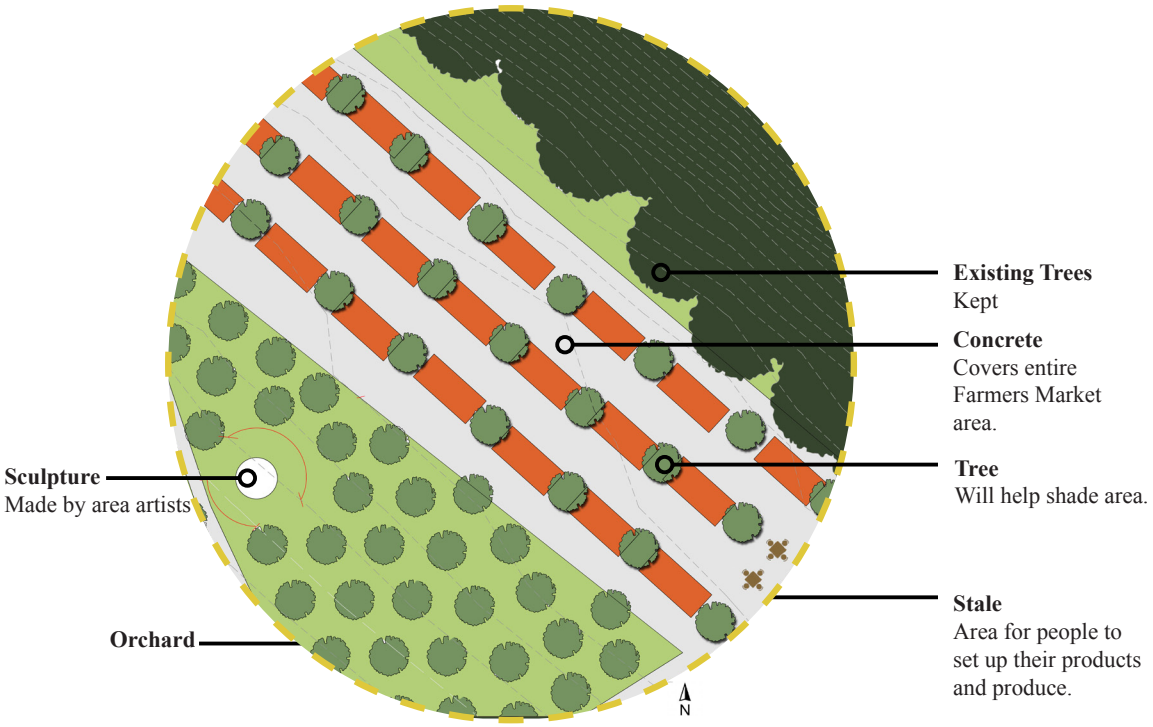
Orchard
Has a variety of fruit bearing shrubs.

Detail Plans are within the orange circles. The yellow lines are the existing grade that has been
removed. The red lines are the changed topography.
The growing areas have been leveled out as well as the farmers market.

The main entrance is a gateway from the urban environment into an oasis of celebration and food. Passing between the greenhouse and teaching building, another plaza with benches, edible fruit trees and sculptures of corn and sunflowers great you. Traveling north west on the path you will be surrounded by gardens of varying sizes and shapes for different time commitments. Sheds, water spigots, and
compost bins are also found in this area are larger garden spaces. All of the garden spaces on this site are rented out and a deposit is made at the beginning and given back if the renter has complied with all of the rules set by the master gardener. Once past the gardens, a plaza provides space for gathering. In these space people will entertain one another with music, dance, and their talents. People then have the choice to take one of two paths depending on their destination. In the middle of the site an orchard of trees and shrubs are lined up for people to harvest with sculptures crafted by local artists are scattered within. At the north most of the site is a farmers market area which is open spring through the fall every day of the week. Crafters, entertainers, food vendors, and growers. Another plaza greats people who parked in the parking lot with a retention pond to handle the runoff.

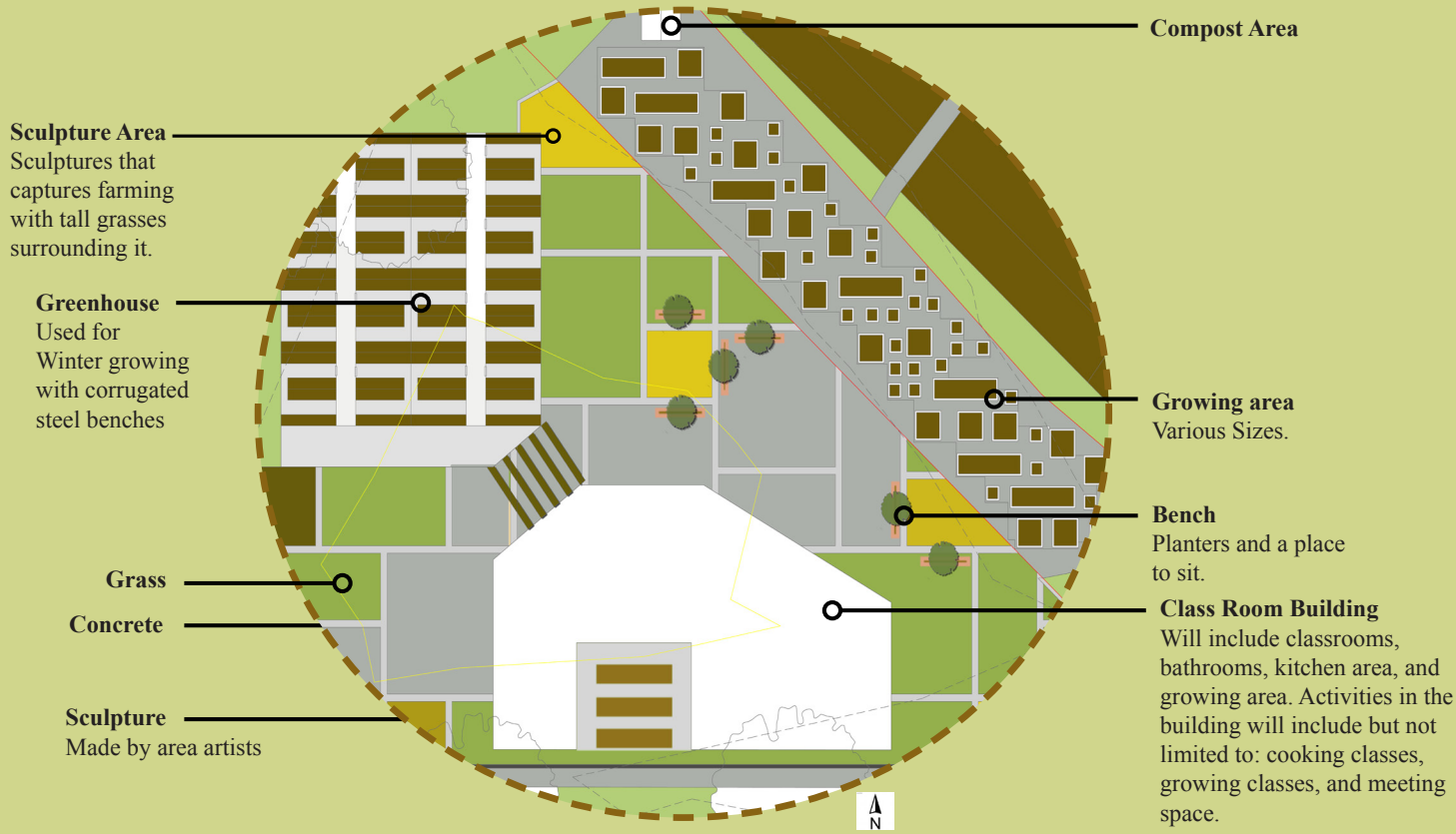
Open Opportunities Details

Detail: Farmers Market



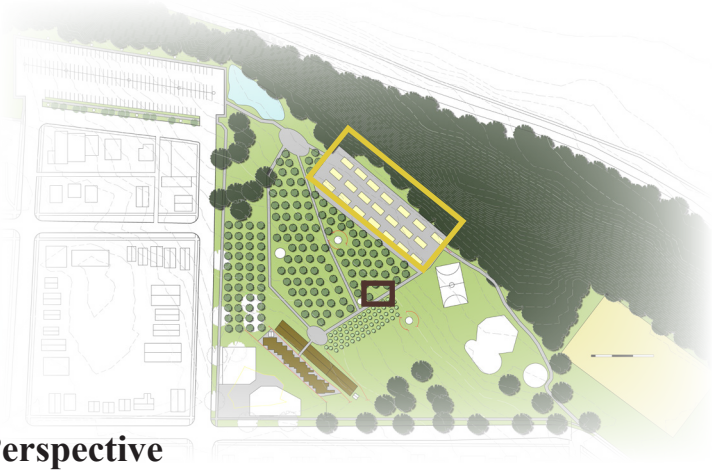
The detail to the right is of the farmers market. It shows that there will be trees between the stales to provide shade and there are seating areas. Within the tree orchard there are sculptures done by local artists.

Detail Plan: Entrance



The detail of the entrance shows the two buildings, one a greenhouse for winter growing and the other a classroom space. The plaza areas in detail with seating and the growing spaces. Here you can see the topography lines and how it has been changed. **Yellow** the topography has been **Red** moved Red changed.

Open Opportunities Perspectives



Food with Space: Entrance Garden Area Summer Perspective

The entrance garden area summer perspective shows that the growing areas are raised with a crushed accesssible gravel surouding the growing areas. It also shows the raised planters with the fruit bearing trees in them.

Celebration: Farmers Market Perspective

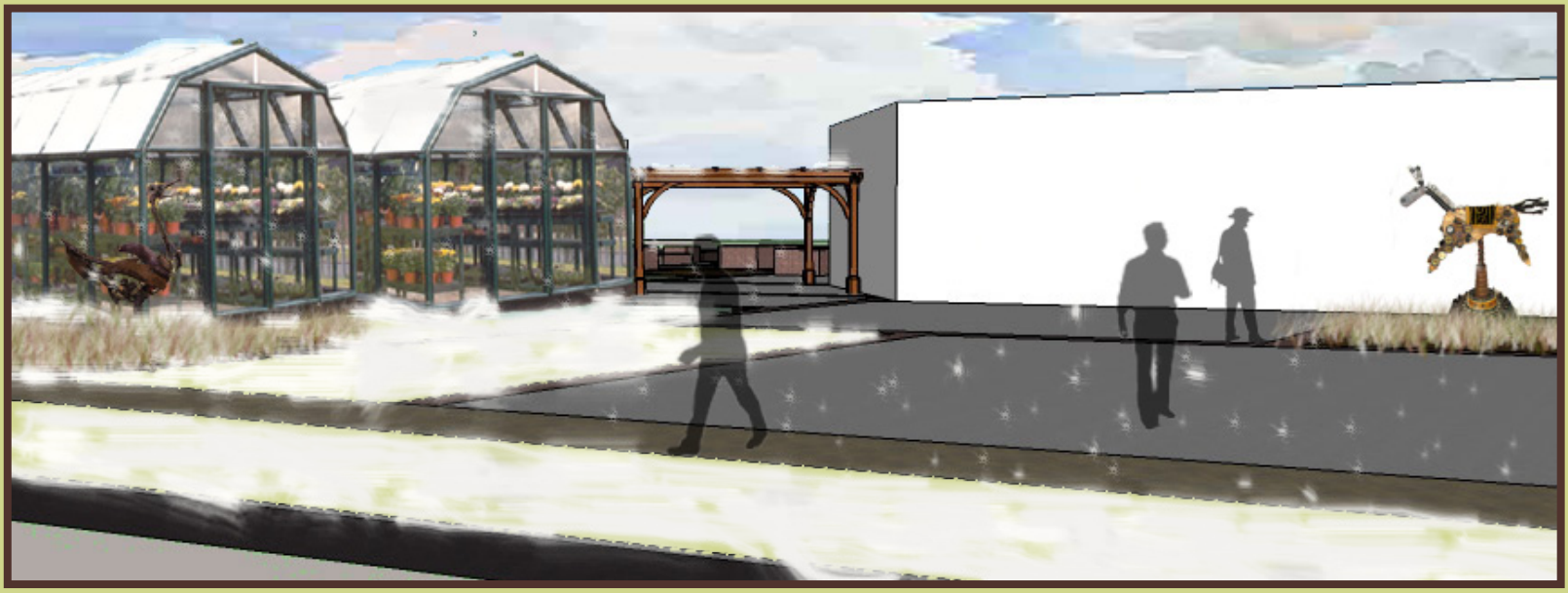
The above perspective is an abstract of the farmers market area. The area is full of people, food stands, vendors, and trees.

Open Opportunities Perspectives

Space: Orchard Spring Perspective

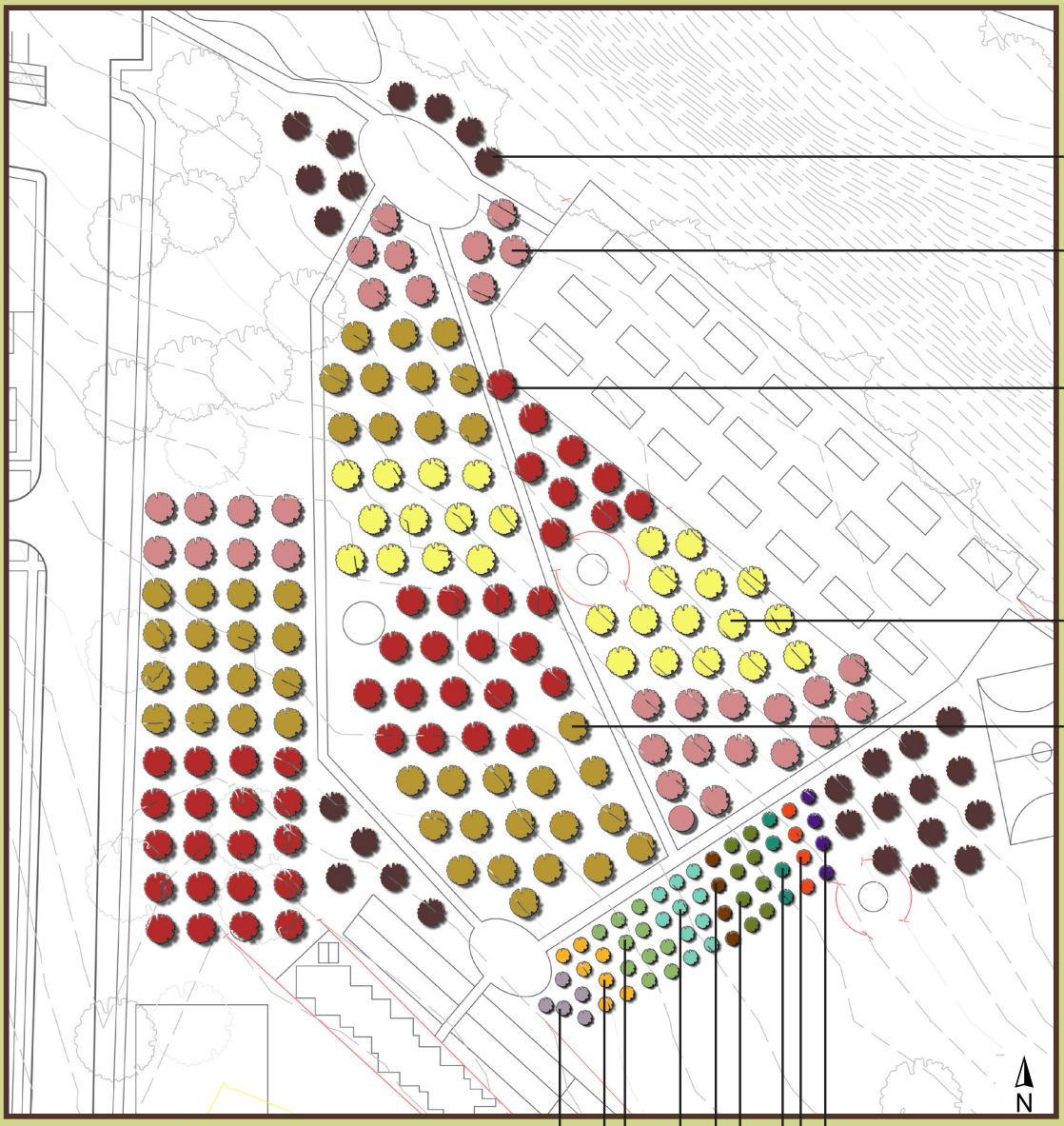
The Orchard Spring Perspective shows how the trees will be all blooming as well as the sculptures aroudn the park. The paths will be paved with a small curb. Trash cans are placed throughout.

Space: South East Entrance Winter Perspective



The Entrance Winter Perspective shows how the greenhouses full of green plants will contrast the snow. As well as the grasses sourrounding the sculptures.

Open Opportunites
Planting Plan and Grading Plan



Plum Tree
'Pipestone' Plum
Oullins Golden Gage Plum

Cherry Tree
Prunus avium 'Bing'
Prunus avium 'Stella'
Prunus avium 'Montmorency'

Apple Tree
Malus domestica "Braeburn"
Malus domestica "Cameo"
Malus domestica "Gala"
Malus domestica "Honeycrisp"
Malus domestica "McIntosh"
Malus domestica 'Gravenstein'

Apricot Tree
Prunus armeniaca "Goldbar"
Prunus armeniaca "Titon"

Pear Tree
Bartlett Pear
Comice Pear
D Anjou Pear

Red lines mean proposed grade change.
Yellow means proposed grade removal.

Prunus besseyi
Prunus americana
Amelanchier alnifolia
Prunus Fruticosa
Prunus tomentosa
Viburnum trilobum
Sheperdia arentea
Sheperdia arentea
Prunus Virginiana

Goals of the Thesis

Academic Goals

The thesis will look at the relationships between people to people and people to food. By creating spaces where people can learn, interact, and have a healthier lifestyle with fresh produce.

Profession Goals

To learn about the relationship between people and their food, by reconnecting them by design.
Enable people to better their lives with healthy food.
Provide an area for people to come together and establish relationships with in the community with each other.

Personal Goals

To bring the sense of the small town community relationships to the larger cities.
To bring agriculture back into the city.

P.14

Conculsion

How can Landscape Architecture improve the lives of city dwellers through Urban Agriculture?

It can bring low income areas affordable healthy food, get people to recconect with their food, and educate them about agriculture, all using new technologies.

Previous Studio Experience by Calendar Year

2nd Year Fall Studio
Professor Kathleen Pepple
Projects
Tea Garden
Battle Lake Park Design

2nd Year Spring Studio
Professor Mark Lindquist
Projects
Fargo Corridor
Community Center Winnipeg, Canada

3rd Year Fall Studio
Professor Stevie Famulari
Projects
Defiant garden
Regent
Snow Symposium
Suburbia
Fargo Analysis

3rd Year Spring Studio Professor Kathleen Pepple
Projects
United Tribal Technical College
Roosevelt Neighborhood

4th Year Fall Studio
Professor Jay Kost
Project:
Duluth

4th Year Spring Studio Professor Stevie Famulari
Projects
Welcome, Mn
Hesco Baskets

5th Year Fall Studio Professor Catherine Wiley
Project:
Red River Valley Watershed

Ashley Hansen

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Home Town: Welcome MN

"NDSU has prepared me for my career by having **opportunities** in both my program and in all of the student organizations offered at NDSU."

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