Roger Williams University
DOCS@RWU

Architecture Theses

School of Architecture, Art, and Historic Preservation Theses

1-1-2010

Rising Architecture

Erica M. Wiggin
Roger Williams University

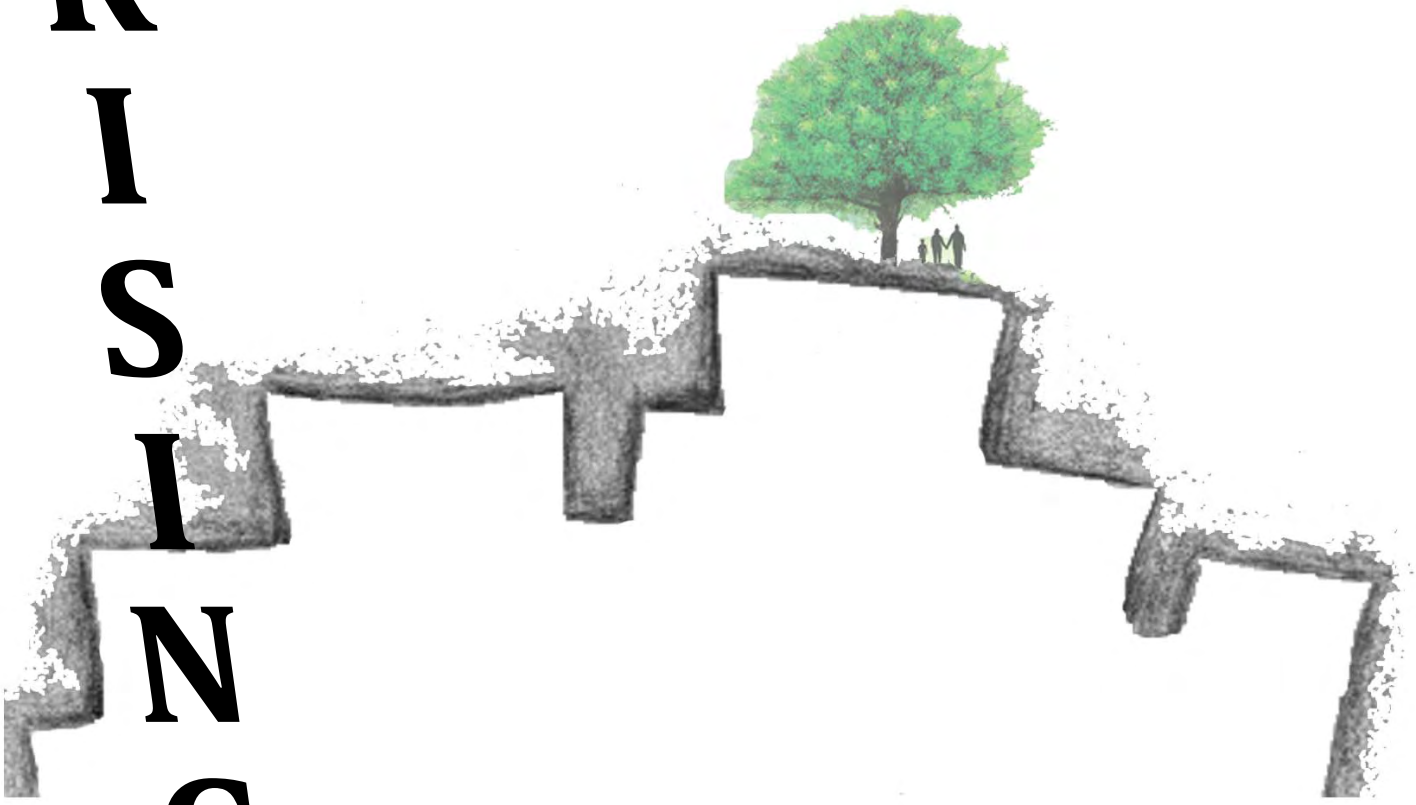
Follow this and additional works at: http://docs.rwu.edu/archthese

 Part of the Architecture Commons

Recommended Citation
Wiggin, Erica M., "Rising Architecture" (2010). *Architecture Theses.* Paper 88.
http://docs.rwu.edu/archthese/88

This Thesis is brought to you for free and open access by the School of Architecture, Art, and Historic Preservation Theses at DOCS@RWU. It has been accepted for inclusion in Architecture Theses by an authorized administrator of DOCS@RWU. For more information, please contact mwu@rwu.edu.

RISING



Residence

A vertical sustainable community in the city that produces, teaches and thrives using past techniques, modern technologies and natural resources.

Roger Williams University: School of Architecture
Independent Graduate Thesis Project
Professor Julian Bonder
Erica M. Wiggin
Spring 2010

Rising Residence

Final Site Perspective from Pedestrian Street

Independent Project submitted to
Roger Williams University, School of Architecture, Art and Historic Preservation
In fulfillment of the requirements of the MArch Degree in Architecture
In May 2010

Signature date

Erica M. Wiggin
Class of 2010

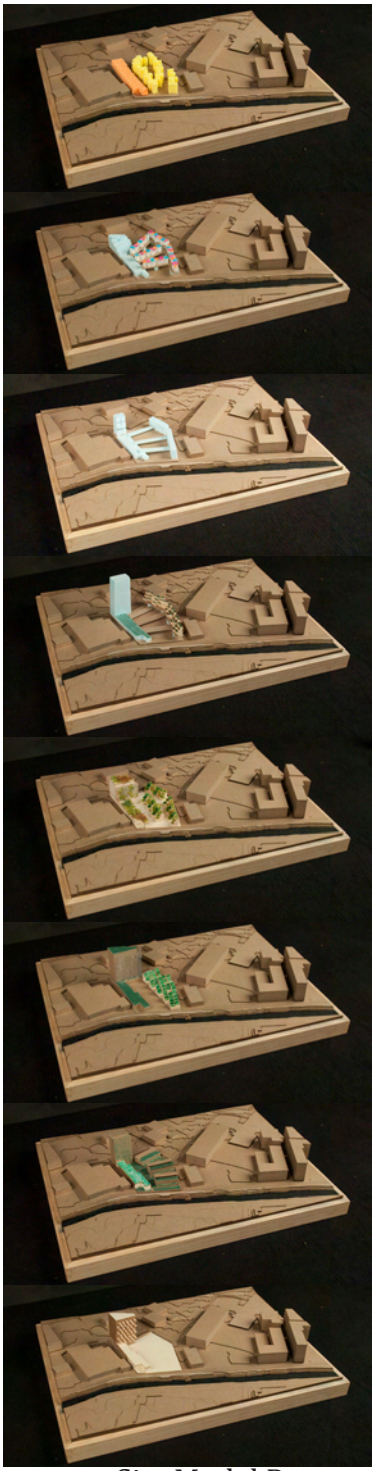
Signature date

Stephen White, AIA
Dean
School of Architecture, Art
and Historic Preservation

Signature date

Julian Bonder
Thesis Advisor
Professor of Architecture
School of Architecture, Art
and Historic Preservation

Rising Residence



Site Model Process
Photos By: Kyle Bendle

Erica M. Wiggin
May 2010

Committee:

Julian Bonder
Thesis Advisor
Professor of Architecture
School of Architecture, Art
and Historic Preservation

Barbara Von-Villas
Writing Specialist
RWU Adjunct Professor

Philip Marshall
RWU, SHAAP Professor

Edgar Adams
RWU, SHAAP Professor

Ulker Copur
RWU, SHAAP Professor

Roberto Viola-Ochoa
SHAAP Adjunct Professor
Sasaki Associates, Inc.

David MacLean
SHAAP Adjunct Professor
David R. MacLean & Associates

Table of Contents

Abstract

Designs are created by a combination of ideas, needs, concerns and risks that are examined and analyzed to expand on a concept. Through team work, we are able to learn while researching and using different sustainable techniques in relation to the site and to the design in order to improve the quality of life for everyone.

Without the modern techniques and technical knowledge that we have today, all of our ancestors were able to use their sites and work with their landscapes to survive, to provide shelter and to feed their families. A modern community that depends on itself while giving back to the surrounding communities would be ideal. Designs need to be personalized so that they facilitate convenience and provide the community with the most benefits.

Many horizontal eco-villages currently flourish throughout our world on all scales in various climates. My thesis investigates the possibility of designing a vertical society of a couple neighborhoods that uses sustainable techniques and new technologies to survive. The sustainable community will find a way to succeed using a smaller piece of land, moving closer to the city center and creating a place that can be enjoyed by the whole community.

Many cities have experienced shrinkage in their city centers, leaving behind abandoned lots and buildings throughout the city streets. The historic city of Providence was split after the construction of I-95, leaving the west side of the city separated and in some cases abandoned from downtown. Creating a couple living communities that work together to live sustainably by producing necessities such as electricity, clean water, food and medicine will teach and provide the residents with enough to survive. The inhabitants will be contributing to the quality of the city as well as improving their lives by learning, developing and teaching new means of living to the rest of the community in their public gardens, classrooms and labs.

Providence, Rhode Island

http://www.temple.edu/undergrad/images/Main%20Pictures/pic_city-home.jpg
http://justinspace.com/blog/wp-content/uploads/2008/11/081112espaceeurodisney2008b.jpg
http://www.joonsookim.com/blog/wp-content/uploads/2008/10/evita.jpg
http://www.instablogsimages.com/images/2008/02/11/zorluecocity_7949.jpg
http://www.metaefficient.com/images/Ambasz_fukuoka_green_roof.jpg
http://northminsterchurch.com/files/Ministry/Green%20city.jpg
http://img.fineliving.com/FINE/2008/03/28/ProvidenceSkyline_w609.jpg


of Love in Action...
making a difference

A Personal Manifesto

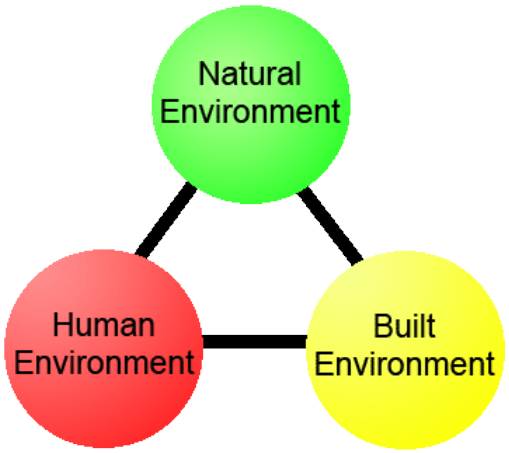
To the architect, everything is architecture; architectural concepts become projects that are designed for the environment. Designs are created by a combination of ideas, needs, concerns and risks that are examined and thoroughly analyzed to expand on a concept. Architecture contributes to the way we function by providing shelter, comfort, enjoyment and protection.

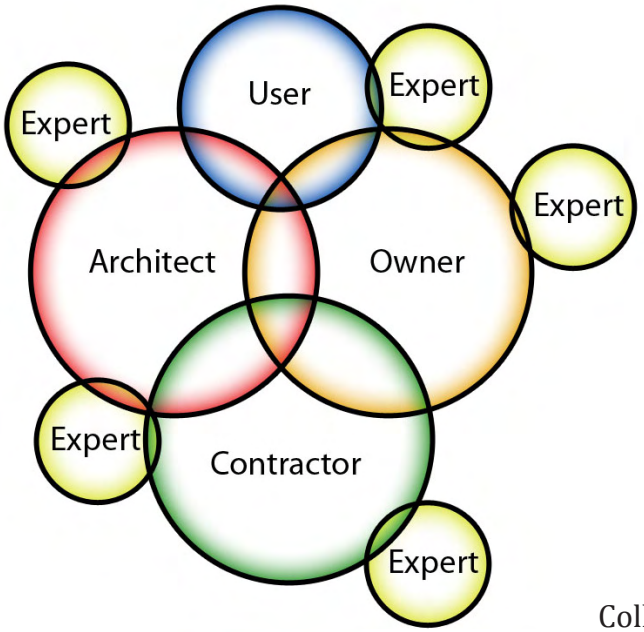
While designing architectural projects, we will work specifically for the user while keeping the collective in mind. Since these spaces will be inhabited or viewed in different ways by the community, the architectural design should not only benefit our clients and residents but also the community at large. Not everyone will use the architectural project but it should be there for all of us to enjoy and experience in different ways.

The best designs are a result of collaboration among architects, users/clients, experts and community members. The collaboration of experts contributes to a successful architectural project. Through collaboration, many problems are discovered and solutions are developed. Teamwork allows us to learn from each other, researching a variety of techniques as they relate to the site and to the design in order to improve the quality of life.

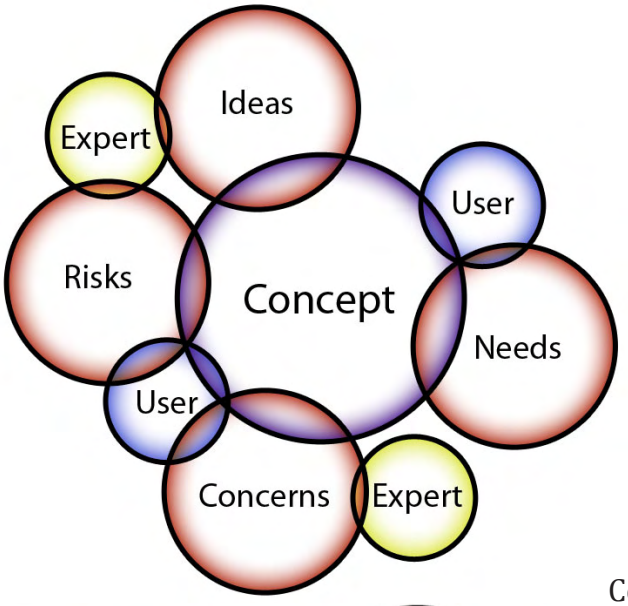
We have to live with our creations and designs, including the impact that they make on the surrounding environment. We take the time to design everything; we should be able to make time to design properly so that the results can help and give back to our communities. Respect for the environment facilitates a benefit from the site context that enhances the community.

More recently, architects have been creating architecture that may be more generic, separate from the context of the surroundings and the environment. Personalized design should make the user's life easier in every way possible instead of causing more confusion. Through specialized architectural design that is personalized and contributes to our lives today we will be able to give back to our context while living normal lives.

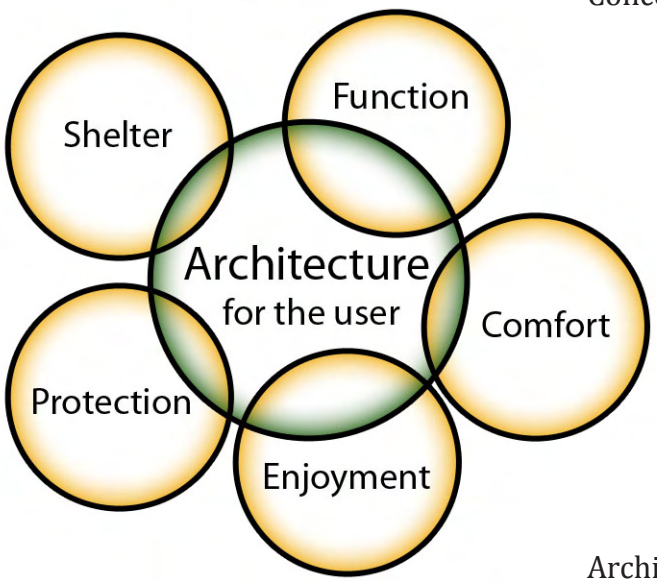




Collaboration



Concept



Architecture

Thesis Proposal: Introduction

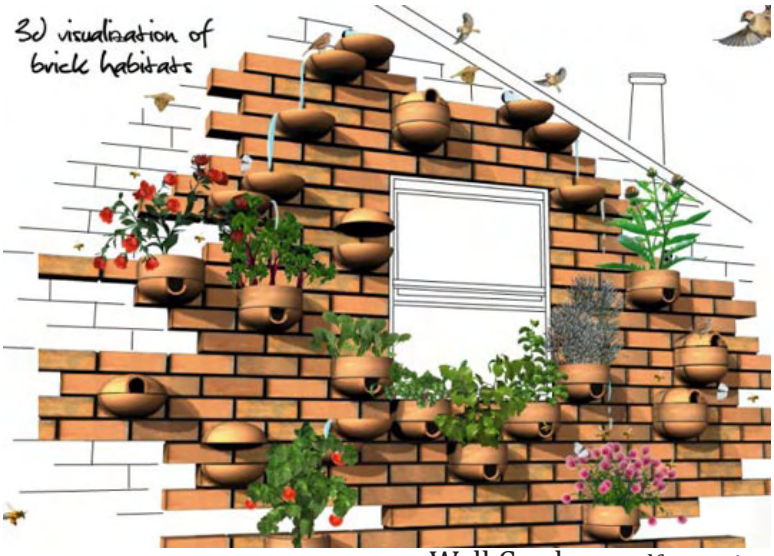
Even without the modern techniques and technical knowledge that we have today, earlier generations were able to use their sites and work with their landscapes to survive, to provide shelter and to feed their families. They did not have the advantages that we have today, but they were able to work together as a community and have been researched and documented throughout history. In the past, communities worked together, using their land in a manner that would be most beneficial to the environment while creating a sustainable community. At this time, we are creating developments which are similar to small communities except that the inhabitants do not work together to produce what they need to survive. We should be able to live the way earlier generations did but with contemporary styles and trends and, by collaborating, we can make a better place for everyone.

We are dependent on others to provide for us though we do not seem to be concerned with the problems that our lifestyle is causing. Evidence proves that our planet cannot keep up with our daily habits. By changing our intentions for our architectural designs, we can help and improve our lives and the communities where we live. Improving the quality of life would make our planet a better place; creating a community that depends on itself while giving back to the surrounding communities would be ideal. We need to learn how to become more reliant on our own resources instead of depending on others to supply what we need.

Lewis Mumford has divided the technological evolution of civilization into three periods in history – Eo-technical, Paleo-technical, Neo-technical - in his book *Techniques and Civilization*. Eo-technical is described as technology that was once handcrafted, mostly decentralized self sufficient. He felt that nature and settlement needed to be in balance to live. Paleo-technical periods used earth as a resource, specifically for coal and water at a cost to our environment because of the pollution of air and water. During this time, man controlled nature through powers such as air conditioning. The current Neo-technical period uses fossil fuels and oil which have increased our carbon emissions, but the problem with high tech centralized systems that continue to pollute our water and air still exist. The evolution of technology that is occurring during our lifetime is out of control and incredibly vulnerable to crisis (Mumford,109).

Some environmentalists, such as my professor Dr. Copur Ulker, have theorized that the Eco-technical period will soon arrive when we will depend on renewable energy and regenerative design as well as decentralized and centralized systems. Technology will become a tool and not a controlling agent, which will facilitate our global efforts to repair the planet that we have demolished through the evolution of our technology.

http://farmphilly.com/group/vertical-farming/
howtobuildapond.com



Wall Garden _ self watering

Wall Garden _used gutters

Outdoor Pond _ Living Machine

Many cities would have the ability to create adequate housing if there were enough public amenities and other housing complexes nearby. An examination of the edges of the cities reveals that some do not have a strong relationship with the city center. To create a better connection, more public spaces should be created that would support a healthy population living in the nearby area. A village should not be located in an unsafe and unfriendly environment.

Eco-villages currently exist throughout the world on all scales, but they have different attributes that contribute to the success of communities. They are designed so that everyone can survive within the site and surroundings while working together to live comfortably with the help of some new styles, techniques and materials. Running water will be needed, and the earth will have to be fertile for year-round gardens to produce enough food for the community. Many of these communities have a large area but are relatively close to the city center with the option of public transportation. At the same time, however, creating a large footprint can be harmful to the environment by consuming scarce open land, cutting down trees and destroying the habitats of other species. An eco-village will require both a specific site and a critical mass which deals with the major consideration of the size of a population necessary for survival and independence within a contemporary sustainable environment.

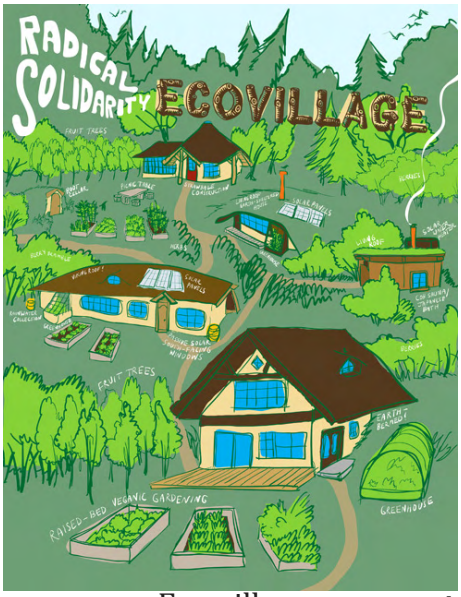
Le Corbusier describes his ideal community in multiple readings as a place that is self sustainable and people know each other by sight, typical among groups of 400 to 500 inhabitants (Corbusier). He explains that a community of 5,000 is the optimum size to create and operate its own government for a larger city. Kirkpatrick Sale has written extensively on this subject in his book, *The Human Scale*. He states, "Human beings cannot adapt to their physical environment alone as individuals...Only by creating a 'human aggregate,' and thus practicing communal and cooperative efforts, are they able not only to survive but in many respects to prevail" (Sale, 180).

Many scholars have investigated the ideal population size for an eco-village to survive successfully. Some of the inhabitants created sustainable communities primarily for survival, but now it is something to which we have to commit to. Robert Adams, John Pfeiffer, Martin Wobst, Charles Erasmus and Kirkpatrick Sale are experts in the subject; all have found similar relation findings relative to earlier communities that usually do not exceed 500, which Sale refers to as the "magic number"(Sale). Rene Dubos points out that during the past 10,000 years most people lived in villages of about 500 inhabitants (Sale). Christopher Alexander states in his book, *The Pattern Language* that modern communities have smaller neighborhoods that usually consist of 4 to 8 houses and should never exceed 12, which would contain 30 to 50 inhabitants (Alexander).

http://www.thegreenhead.com/2009/03/living-wall-planter-large-vertical-garden.php
http://www.inhabitat.com/2007/08/30/powerseed-sustainable-solar-plant-art-installation/

Wall Garden _built in

Integrated Technologies _ wind / sun



Eco-village _ communal

Thesis Proposal

My thesis is an eco-village that survives and depends on past techniques but also uses sustainable methods and new technologies. Thirty to one hundred families who live in their own homes but work the land together would facilitate better communication and relationships. There are hundreds of examples of these horizontal sustainable communities that might find a way to succeed using a smaller piece of land, moving closer to the city center and creating a place that can be enjoyed by the whole community.

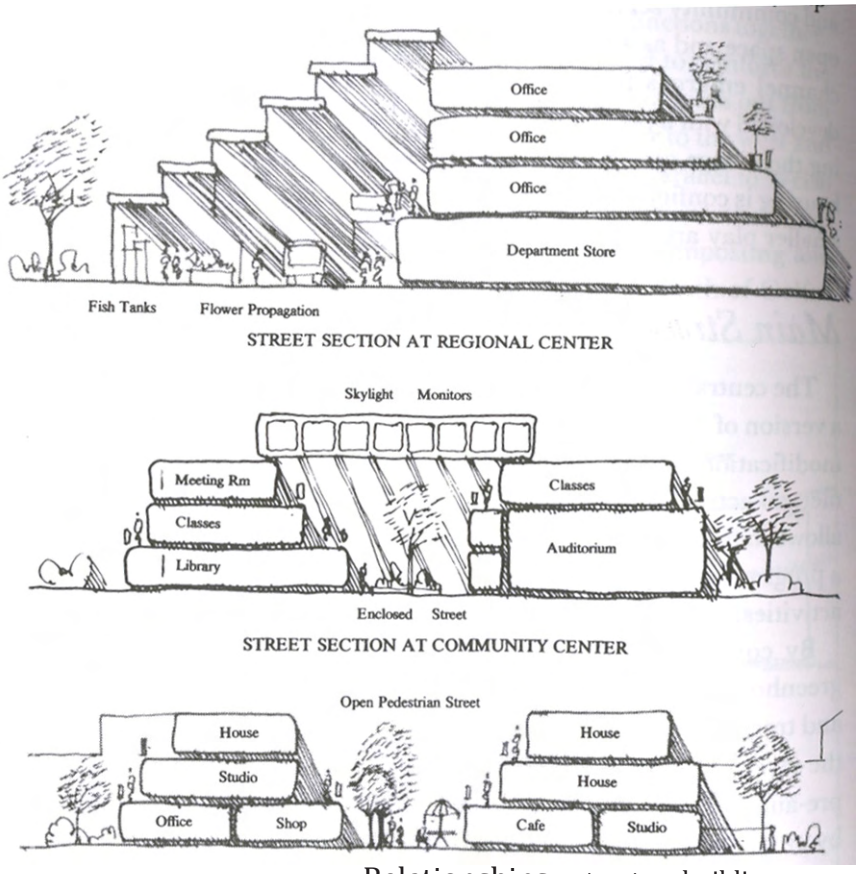
Though many successful precedents can be found, they are different and have different population sizes. Eco-Village Ithaca consists of 30 homes within a neighborhood; the inhabitants will soon begin constructing their third neighborhood. Eco-Village Ithaca has been a great addition for New England communities since its success is a perfect model for potential smaller sustainable villages that have 30 to 50 people in a neighborhood (Ithaca). Kronsberg in Germany, on the other hand, is another successful aspiring community that is aiming for 6,000 houses which would eventually accommodate 15,000 people (Kronsberg). Though the community is much larger than Eco-Village Ithaca, the residents are found in separate neighborhoods on the site and work together on a larger scale to succeed and thrive.

In order to create sustainable communities, there are four main overall goals: ecological sustainability, urban ecology sustainability, cultural/historical/social sustainability, and technology sustainability. These topics will be examined and integrated into the overall design concept. Not only will the design apply sustainable strategies to the site and building, it will also satisfy the users' specific wants and needs.

One of the most important aspects of the project is the site. The site also should be located on a waterway system that would give the community opportunities for employment and design multiple different sustainable water techniques. The site will contain many features that promote sustainability such as water or wetlands, fertile soil, natural sunlight and orientation.

An unused site provides many opportunities to transform the land and to create a community. Working with a damaged site is a more productive and beneficial way of transforming the environment. These sites have been occupied at least once in the past but have since been abandoned, providing the opportunity to revive and restore the aspects of the site that once existed. Debris from the abandoned site will be organized and separated to provide materials that will be reused and recycled to make the construction process more sustainable and to provide or use salvaged materials that would otherwise be sent to a landfill.

Winter, Mick. EcoCities (top diagram on opposite page)
http://www.cleanwatermn.org/resources/Hard-Surfaces.aspx



Relationships _ street vs. building

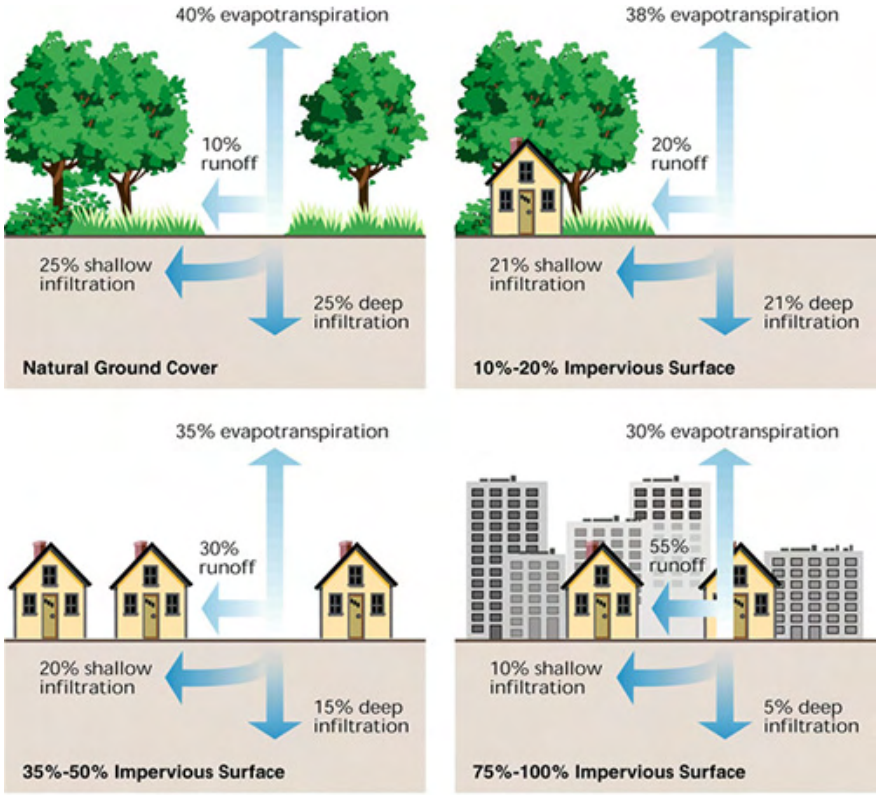
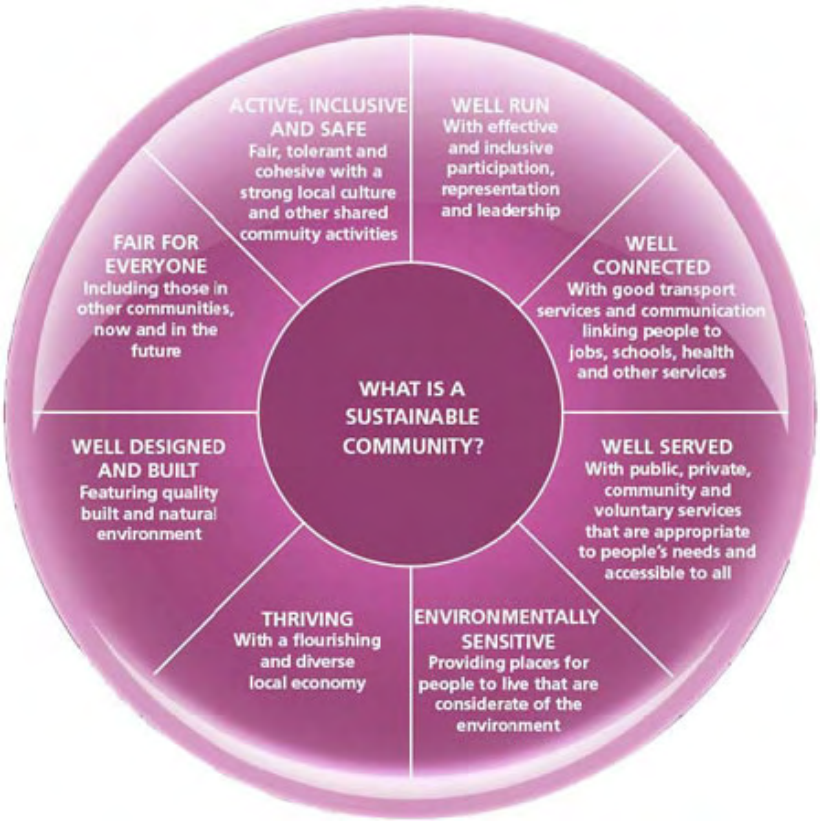


Fig. 3.21 -- Relationship between impervious cover and surface runoff. Impervious cover in a watershed results in increased surface runoff. As little as 10 percent impervious cover in a watershed can result in stream degradation.
In Stream Corridor Restoration: Principles, Processes, and Practices (10/98).
By the Federal Interagency Stream Restoration Working Group (FISRWG) (15 Federal agencies of the U.S.)

Water run-off _ pervious vs impervious

Many cities have been victim to foreclosure and are now experiencing shrinkage in their city populations. Using a plot of land in the middle of nowhere does nothing to facilitate community connection to a larger more reliable city. Being able to revive a small city neighborhood that has been damaged and forgotten can give the depleted city new hope.

These communities should be located near larger cities or even within a city for convenience and the ability to connect to public transportation systems and basic necessities. An Eco-village will require a substantial pieces of land that is not readily available in cities; at the same time, creating a vertical eco-village in any location would be a challenge. The aspects of the eco-village have been examined and reorganized in order to create a successful vertical village with all the necessities and attributes that are found in a working village. The eco-community will be designed based on the needs, wants and necessities of the everyday individual.



Sustainable Community _ what is it?

http://www.die-neue-stadt.de/archiv/ausgabe_ii_vi/sustainable_community.jpg
http://aedesign.wordpress.com/
http://knowledge.allianz.com/nopi_downloads/images/tokyo_zoom.jpg

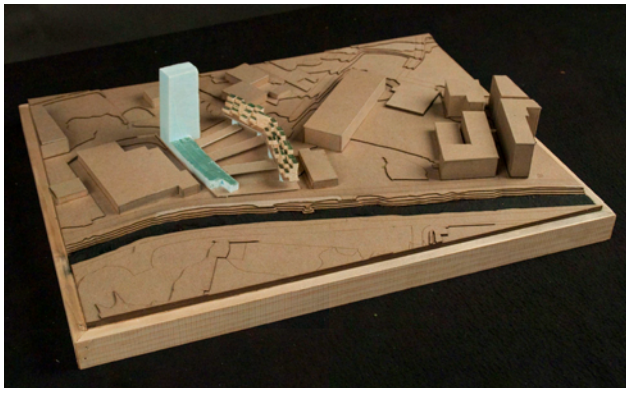
Tokyo City _ large, overcrowded, busy

MASDAR City _ sustainable, dense, urban

Program

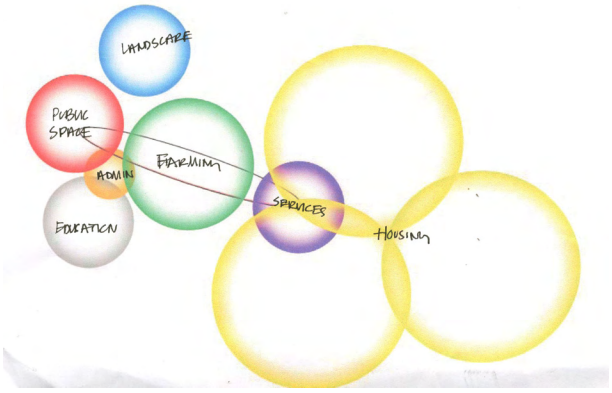
Developing a sustainable eco-village in the city would be the challenge, keeping the client and user in mind. The city is the client and allowing the street level to be more of a public amenity could permit the architecture to give back to the surrounding community. Limiting construction to half the site would leave more open public space and would provide the residents with more sunlight, which would otherwise be overshadowed by tall buildings. The housing units will contain two or more bedrooms, allowing families, students and singles to live together within the complex for a reasonable rate. The inhabitants will have to practice sustainable techniques and will be expected to practice organic farming and participate in community affairs.

Based on family needs and sustainable attributes, a program has been created to give the inhabitants everything to be found in a successful vertical community in the city. The proposed program would total around 130,000 gross square feet (Program Table) and would be split into seven categories: Public Space, Administration, Housing, Farming, Landscape, Educational Space and Services. These programmatic spaces would be organized and arranged to create the most successful social relationships and interactions while still creating the most efficient spaces for the user to enjoy. Throughout the design process parts of the program have been made larger and smaller based on the given building dimensions and the size of the site.



Programatic Study Model on Site

Photo By: Kyle Bendle



Program Relationships

Public Space	*Program Area*	*Units*	*Total Area (S.F)*
Transportation Hub	100 sqft	1	100 sqft
Community Center	1,500 sqft	(100 People) 1	1,500 sqft
Market Space	80 sqft	6	480 sqft
Parking	200 sqft	12	2,400 sqft
		Total Net: **4,480** (1.3 sqft)	Total Gross: **5,824**

Administration	*Program Area*	*Units*	*Total Area (S.F)*
Lobby	400 sqft	1	400 sqft
Housing Office	100 sqft	3	300 sqft
Farming Office	100 sqft	2	200 sqft
Sustainable Office	100 sqft	2	200 sqft
		Total Net: **1,100** (1.3 sqft)	Total Gross: **1,430**

Housing	*Program Area*	*Units*	*Total Area (S.F)*
Two Bedroom	1,200 + 400 = 1,600 sqft	12	19,200 sqft
Three Bedroom	1,400 + 600 = 2,000 sqft	12	24,000 sqft
Four Bedroom	1,700 + 800 = 2,500 sqft	12	30,000 sqft
Storage/Staff	500 sqft	3	1,500 sqft
		Total Net: **74,700** (1.3 sqft)	Total Gross: **97,110**

Farming	*Program Area*	*Units*	*Total Area (S.F)*
Fruit/Berry Trees	2,000 sqft	1	2,000 sqft
Dairy/Poultry	2,000 sqft	1	2,000 sqft
Communal Garden	3,000 sqft	1	3,000 sqft
Medicinal/Herb	1,000 sqft	1	1,000 sqft
		Total Net: **8,000** (1.3 sqft)	Total Gross: **10,400**

Landscape	*Program Area*	*Units*	*Total Area (S.F)*
Swells/Grasses	50 sqft	6	300 sqft
Public Park	3,000 sqft	1	3,000 sqft
Pond (fish or skate)	1,000 sqft	1	1,000 sqft
		Total Net: **4,300** (1.3 sqft)	Total Gross: **5,590**

Services	*Program Area*	*Units*	*Total Area (S.F)*
Water Storage	1,500 sqft	1	1,500 sqft
Storage Space	500 sqft	1	500 sqft
Loading Dock	1,000 sqft	1	1,000 sqft
Wind and Solar	800 sqft	1	800 sqft
Mechanical Space	1,500 sqft	1	1,500 sqft
		Total Net: **5,300** (1.3 sqft)	Total Gross: **6,890**

Education	*Program Area*	*Units*	*Total Area (S.F)*
Storage/Freezing	600 sqft	1	600 sqft
Living Machines	600 sqft	1	600 sqft
Hydroponic	600 sqft	1	600 sqft
Lecture Hall	1,000 sqft	1	1,000 sqft
		Total Net: **2,800** (1.3 sqft)	Total Gross: **3,640**

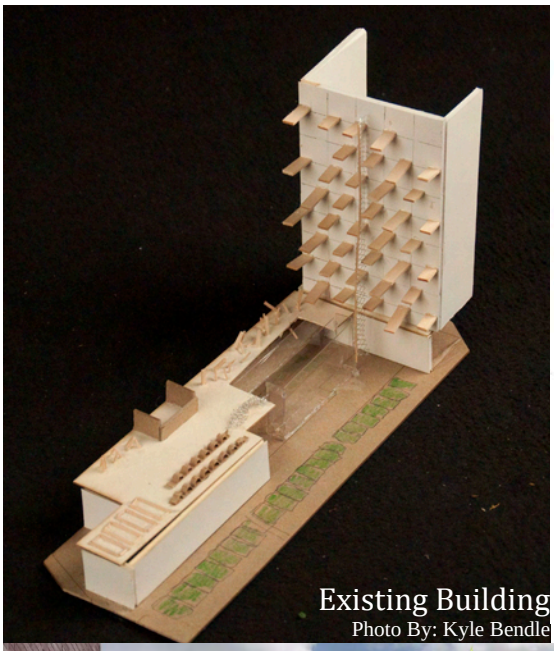
Total Gross (sqft): **<u>130, 088 sqft</u>**

Public Space

The Public Spaces will be used by the community members and residents. At the street level the site is constructed as a pedestrian pass-through; within which one could sit down to relax or pick a couple apples and peaches for lunch. The site would include a public transportation, a community center, a market space and parking. Public transportation comes down both public sides of the street where grass and sidewalks are located. Parking will be located under the existing building for the residents, visitors and employees which allows the fertile soil around the site to be untouched and used for gardens. The community centers, large open areas for either 50 to 100 people, will be used or rented by anyone in the city, allowing the space to be *used* for many different functions. There are also a number of meeting rooms and other event spaces that can be rented out by any of the members in the city and residence. A number of sheltered market spaces are located on the site for local artists and entrepreneurs to sell their products and goods. Also, communal gardens are fenced off along the main pedestrian street allowing other people in the neighborhood to use these spaces to grow their own food supply if they do not have the option at their house or apartment.

Example

The public space throughout the site should have an overall inviting feeling for all visitors and the residents of the community. Most of these spaces are outside and receive plenty of natural day light but will be well lit at night for the residents or members of the community that use the site as a pass-through. Most of these spaces are open to the sky, but the market spaces have ceilings that are 16 feet tall, though the markets are covered they still open up into the exterior. The space will be busy and will always have a lot going on, these public areas are very separated from the more private areas with either planting or solid objects. The public spaces all open up into the center of the site with connections to either streets and allowing views of different parts of the city.



Existing Building
Photo By: Kyle Bendle

Mid-Term Site Model
Photo By: Kyle Bendle

Market Place /Community Gardens

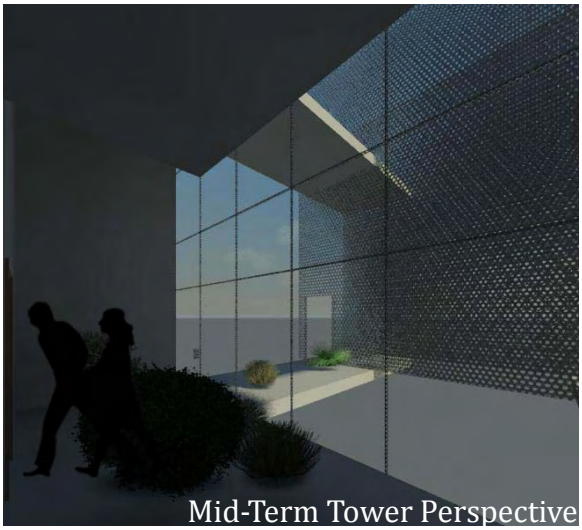
Housing

Housing makes up more than 70% of the site and consists of two, three and four bedroom units and a couple one bedroom handicap units. There is a total of three neighborhoods in the community and one fourteen story tower with two level units . The houses have a living room, dining room, kitchen, laundry room and at least one and half baths with 100 sqft of garden space and 100 sqft of outdoor space per bedroom. Two bedroom units are about 1,200 sqft; with the outdoor space and garden, the size would increase to about 1,600 sqft. Three bedroom units are about 1,400 sqft with a total of about 2,000 sqft, and four bedroom units are about 1,700 sqft with a total of about 2,500 sqft. The houses are totally sustainable with tanks to capture rainwater used to water vertical gardens that would save space and with large freezers to store foods for the winter. The users would have no extra fees besides the purchase of the house. Communal help and cooperation would be expected.

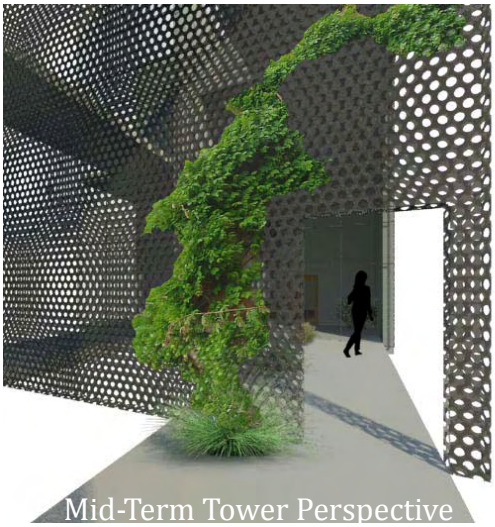

Example


Example

Though the four neighborhoods all have the same goals and aspirations of living in a sustainable, living community, some aspects of their housing conditions change. The three neighborhoods that are located on the ground floor are based off your typical row house. They are triple deckers with a raised garden or yard on the first floor and another garden porch on the top floor. The roof angles are slanted toward the rainwater collection barrels on the porch. Toward the back of the row houses is a small, thin street for the residents vehicles with one covered carport per unit. The tower units are double story and each unit has one reserved parking spot below grade from which then, they can use the elevators to continue up to their desired floor. One unit on each level is for handicap use and since the second story is not being used, a four bedroom unit was designed next door on every floor. The garden space in the tower is very different than the typical garden space since each exterior space is a thin balcony that extends off the tower toward the south sun. There is a vertical screen that folds in and out of the balconies allowing for the residents to utilize the screen for vertical farming. Each tower unit also has a small sun room and a covered workspace for their exterior area. During the winter the screen will be empty allowing lots of sunlight to enter the units and in the summer the screen and balconies will be full of vegetation which will block most of the sunlight, allowing the units to stay cool during the hot summer days.

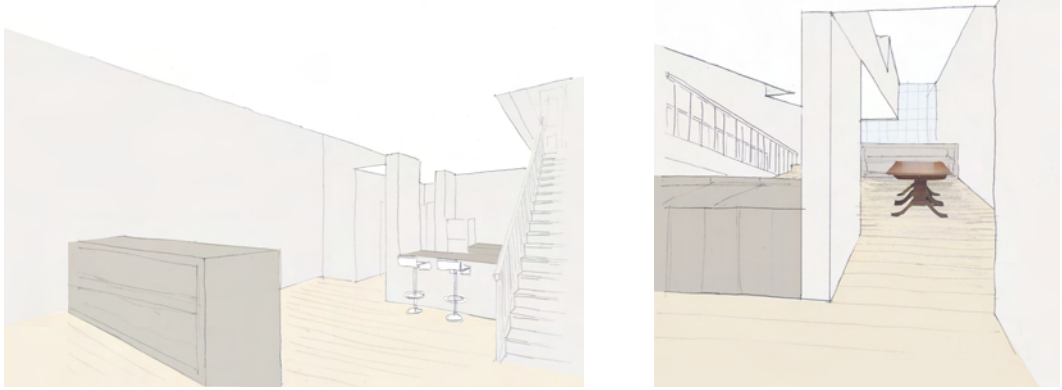


Mid-Term Tower Perspective



Mid-Term Tower Perspective

Mid-Term Tower / Screen Section Perspective



Interior sketches - Gate Review

Farming

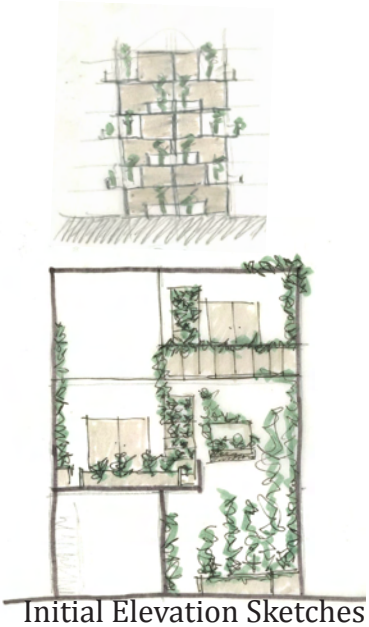
Beside the garden spaces within the individual houses, there would be larger communal gardens throughout the site. These areas would be used for larger scale farming, specifically berries and trees, dairy and poultry, medicinal plants and communal vegetable and plant gardens. These large gardens could have an assortment of plant life allowing the clients to grow and tend to what they need and like. Though people would be hired to take care of the communal gardens, it would be expected that the users would come and go as they pleased to help care for the gardens and food. Composting will not only be sustainable and necessary it has a significant influence on the quality of our food, products and living conditions.

Example

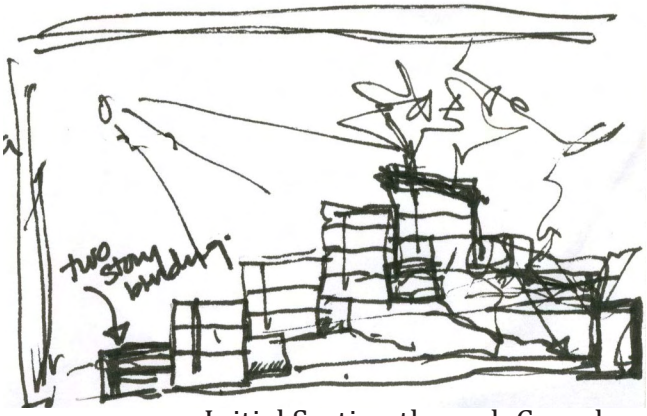
Example

The gardens are spread out throughout the whole site, allowing the experience throughout the project to a constant edible garden as well as a living educational experience. Bringing back to the community and the users is very important and to be able to learn and teach the exact methods of sustainable living from experience is crucial. It is a learning community and that is exactly what the farms are there for. The walking experience on the site is one a fruit and nut lover would cherish, being covered with trees such as apples, peaches, pears and lots to blueberry bushes. A row of community gardens are placed between the two main pedestrian paths up from Promenade Street. These gardens are rented out by locals in the area that are interested in growing their own foods but do not have their own space in their apartment or yard in the city. There are hydroponic garden beds open to the public next to the open markets that are growing all types of small headed vegetables, fruits and leafy products. Upstairs is the hydroponically grown, long, vine-like food products such as tomatoes and cucumbers. On the roof of the existing buildings is all types of organic soil beds and trees as well as a medicinal garden. The whole site is filled with food so wherever you go, there should be something you like.

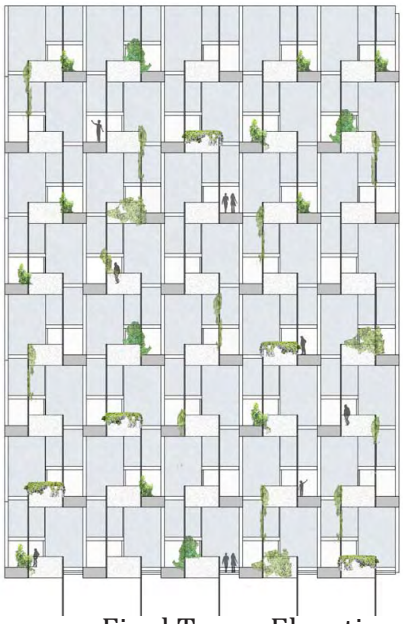
Hydroponic Garden and Market



Initial Elevation Sketches



Initial Section through Complex



Final Tower Elevation

Initial Garden Plan Sketch

Community Gardens and Hydroponics

Landscape

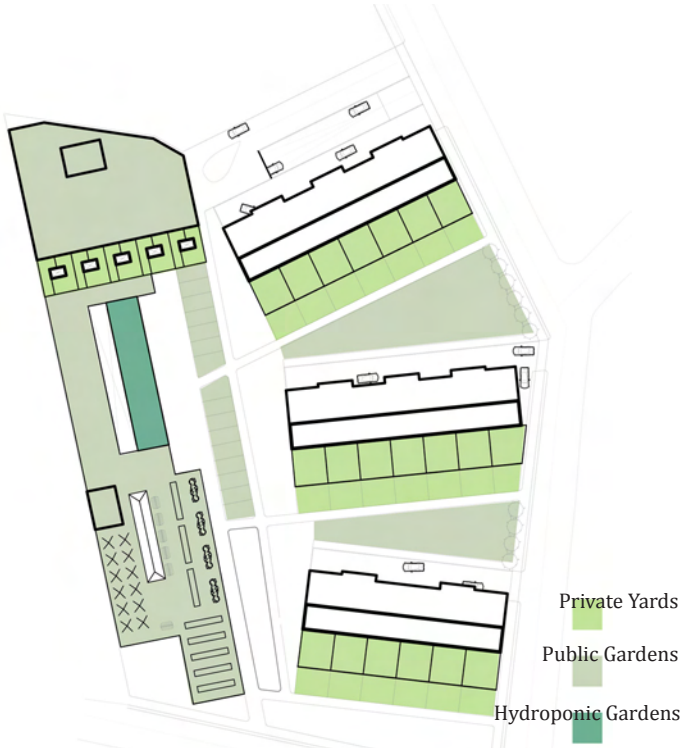
Landscape elements would mostly occupy the open space that would be present on the street level. Approximately half the site would be open to enable the creation of a public park which would be accessible to any passerby. Some of these spaces are filled with fruit and nut trees for not only the production of food but for privacy for the row houses. All these bushes and trees are cared for by employees of the project, but can be enjoyed by any passerby. Another aspect that should be considered at the site is waste and water management. Many of the buildings have barrels to collect the rainwater and therefore can be used by the residents and staff. Since the site does have a slight slope towards the river, it allows for swells to be created throughout the site that lead to planting containers, trees or right back into the river.


Example

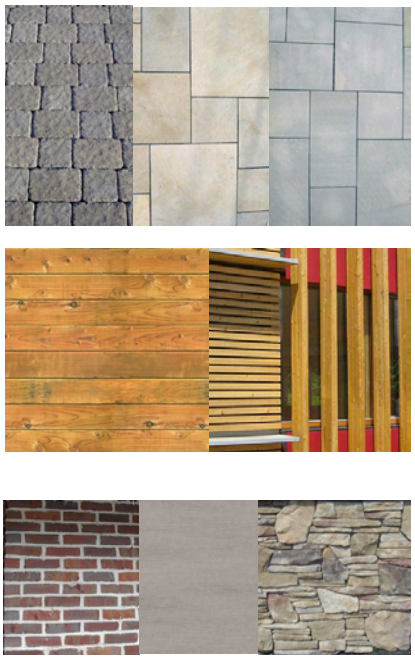

Example

Education

Common labs and rooms will be set up in the educational building that will allow the public to learn and see how the community functions and lives sustainably. These are also available to the residents that might be new to sustainable living and organic food. The labs will provide the inhabitants and community to learn about seeding, food production, hydroponics, storing, canning, seeding and freezing. The lab is for more hands on experience and learning and the classrooms are used for everyday lectures, classes and meetings. The educational experience is more than just the everyday class but includes the site, surroundings and the experience. The learning experience is for everyone to continue to learn even if they are just passing by, and most likely they will want to come back. The education will never end and will also be changing and adapting to the new life around it constantly. In the middle of the classrooms and labs are large garden beds that are filled with more of tropical plants that can live indoors and would not survive in our harsh winters.



Green Space



Combination of Materials on Site

Pedestrian Path towards Existing Building

Administration

Administration offices will be included for marketing and employee use. The housing offices, farming offices and those used for maintenance have one common lobby that will provide a waiting area as well as display information about the construction and goals of the project. The housing offices facilitate rentals or purchases. The farming office supports the communal gardens and farmers market. The offices focused on sustainability and maintenance manage the equipment and give tours to interested parties.

The administration offices are located on the public ground so that visitors and community members can locate the office and feel welcomed. There is plenty of natural and artificial light where necessary. Most of these spaces are public and are here for the visitors and also the residents that need help from the housing or farming offices. The offices are located between the gardens, farmers market and the housing. It is centered in the more public part of the site so that it looks over all the important functions.


Example

Services

Services is another aspect of the project that is located below grade in contrast with the loading dock which is used for deliveries. Storage space and equipment are located together in a cool space in the basement without the need of windows. Wind and solar power are used on top of the tower in the project where the advantages of the wind and sun are plentiful.

These spaces are private and out of the way of visitors and residents. The rooms are mostly used by the staff and maintenance crews that work on the site. There is little natural light in most cases since they are located in the lower floors of the existing building. The spaces are not used much but are very important to the success and overall upkeep of the project. It is connected to the parking garage, loading dock and the main floor near the center of the project.

Process Site Models
Photos By: Kyle Bendle

An Experience

I'm on my way to my grandparent's house. I love going there on Sundays to visit and help them pick the fresh vegetables in the garden. The sun is shining and the park is filled with sunlight while most of the people are on their porches looking over the city. As I go by the large pond, many families are fishing, catching small trout and laughing together.

After locking up my bike, I run to the farmers market and pick up a dozen fresh eggs for breakfast. While waiting for the elevator I notice the number of people that are passing through the open area. I'm not sure if they are taking a shortcut for convenience or they just enjoy the atmosphere of the open structure, which contributes to a feeling of escape from the busy city. Jumping on the elevator, I overhear an older couple exiting the elevator talk about the strawberries they just picked on the upper floors. My mouth starts watering – I have to go there.

When the elevator hits the fifth floor, I am off, running straight to my grandparents' front door. They have also heard about the fresh berries and are ready to go picking when I enter. We take the elevator to the top floor where the roof is full of large trees and bushes full of all sorts of fruits. My grandmother catches me repeatedly looking at the beautiful landscape of the city; she has to constantly remind me that I am supposed to be picking.

Back down at their house, my grandmother makes us some fresh shortcake to go with our fresh strawberries. While she is cooking, I go out on the porch and pick the tomatoes and cucumbers that have ripened in her garden since the last time I visited. Visiting my grandparents is a learning experience and always creates unforgettable memories.

Organic Farming _ berry picking

www.strawberry-plants.com/about-us.htm
http://www.gardeninggonewild.com/wp-content/uploads/2008/06/porch-steps-may-30-08.jpg
http://citycomfortsblog.typepad.com/photos/uncategorized/sharp_500x333.jpg

Example

Open Ground Floor _ walkways

Options _ flowers, food or herbs

Site

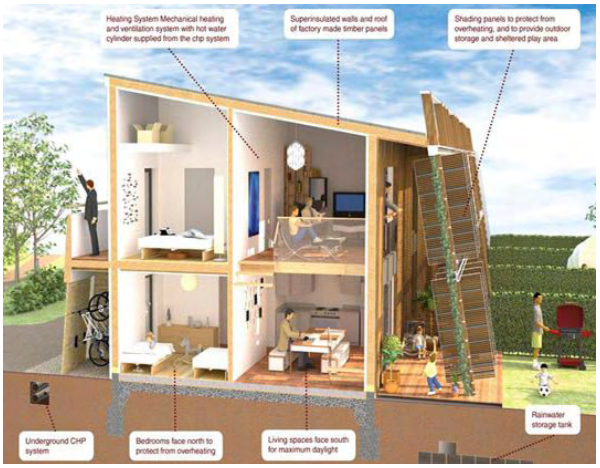
A vertical eco-village in the city requires much consideration before the perfect site can be chosen. Most of the cities that have been examined have many deserted and abandoned areas on the city edge. Many planners have redesigned and proposed alternative plans for these neighborhoods, but the poor economy has impeded their efforts. These spaces and proposed designs show the potential for these sites and the possibility of a better connection to the city.

Of primary importance is the location of the site, which needs to be located near a source of water at the city's edge. To create a successful housing development, the neighborhoods have to be partially developed already, and the site will have to provide open land for public areas. Most of the public amenities and shopping areas are already located on the main streets or within walking distance to allow for the architectural program to focus more on the sustainability of the users.

The cities that have been researched are smaller cities that have dense, populated city centers with vacant city edges that could use some help. While researching I looked for abandoned, existing, leftover and contaminated sites so that my project will be less destructive to the earth while giving more back to the community.

From my research, three cities seemed to fit my criteria for the site. New London, Connecticut is a small city with a taller city center; it is located near the water's edge and has an interesting history. Portland, Maine is currently doing some new urban work that, for the most part, does not exceed ten stories. Though the latter city is smaller in scale and much colder, it does promote the potential for some incredible waterfront sites.

Providence, Rhode Island seems to have a thriving and developing city center, but could use some better connections especially since the highway project started. On the western side of I 95, there are some strips of land with great historical importance that cry for redevelopment. Known as Federal Hill and the Promenade District, the areas need a real connection with the city center of Providence. Some of these areas have been redesigned -Promenade Street, Atwells Avenue and Westminster Street – but construction has not yet begun.



www.archicentral.com/tag/eco/
http://www.inhabitat.com/author/evelyn/
http://www.homehousedesign.com/luxurious-residences-modern-house-in-kuala-lumpur-malaysia/
http://www.hollowtop.com/pls.htm
www.ecofriend.org
http://www.inhabitat.com/wp-content/uploads/earth.jpg

Site: Identification

Providence, Rhode Island

Providence, Rhode Island is a historic city that has been growing and expanding over recent years and offers many opportunities for restoring abandoned spaces as well as creating a better relationship with the western neighborhoods to the historic downtown. Following the world wars the city workers opened manufacturing mills that were spread along the river to allow for easy access to trade. These businesses became more common between year and year but now many have been forgotten about and have fallen into disrepair. These business districts that were created on the western part of the city quickly became full of family enclaves and truly developed their own cultural identity. The connections, by way of the many streets, to the historic downtown was interrupted by the I 95 project and isolation has been a problem in the historic districts ever since. Nevertheless the Providence River allows for the opportunity to connect to nature and use the water in different ways.

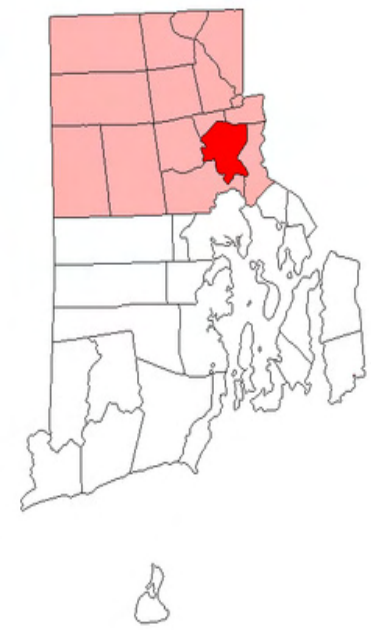
The city covers a total of 20.5 square miles including 2.1 square miles (10%) of waterways. The population is currently a little higher than 170,000 people in the city of Providence with a density of 9,473 people per square mile. The climate in Providence, Rhode Island ranges between humid continental and humid subtropical with warm summers, cold winters and high humidity year-round. January is the coldest month, usually averaging between 20 and 30 degrees Fahrenheit. July is the warmest month with average temperatures averaging between 70 and 80 degrees Fahrenheit. The record high temperature in the city is 104 degrees in 1975 and the record low is -17 degrees in 1934. The USDA rates the city in zone 6a, an "in-between" climate, which exemplifies the unpredictable and unexpected weather conditions. Since Providence is in the middle of the state, it becomes warmer than its surrounding coastal towns because of the ocean. Rain and wind are also very common in the city. Higher levels of rain are more common in the winter months when the powerful storms arrive. Monthly precipitation ranges from an average high of 4.43 inches in March to a low of 3.17 in July. (Sources below)

Weather data for Providence, Rhode Island [hide]

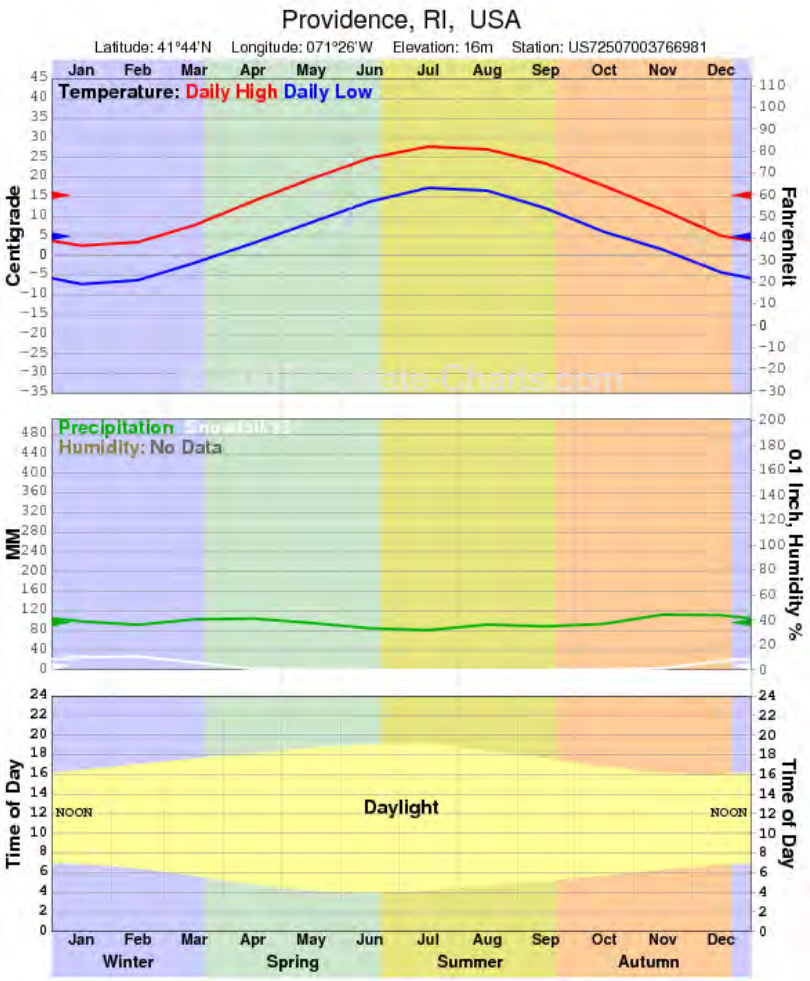
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °F (°C)	69 (21)	72 (22)	90 (32)	98 (37)	96 (35)	98 (37)	102 (39)	104 (40)	100 (38)	88 (31)	81 (27)	77 (25)	104 (40)
Average high °F (°C)	37 (3)	39 (4)	48 (9)	58 (14)	69 (21)	77 (25)	83 (28)	81 (27)	73 (23)	63 (17)	52 (11)	42 (6)	60 (16)
Average low °F (°C)	20 (-7)	23 (-5)	30 (-1)	39 (4)	49 (9)	58 (14)	64 (18)	63 (17)	55 (13)	43 (6)	35 (2)	26 (-3)	42 (6)
Record low °F (°C)	-13 (-25)	-17 (-27)	1 (-17)	11 (-12)	29 (-2)	39 (4)	48 (9)	40 (4)	32 (0)	20 (-7)	6 (-14)	-12 (-24)	-17 (-27)
Precipitation inches (mm)	4.37 (111)	3.45 (87.6)	4.43 (112.5)	4.16 (105.7)	3.66 (93)	3.38 (85.9)	3.17 (80.5)	3.90 (99.1)	3.70 (94)	3.69 (93.7)	4.40 (111.8)	4.14 (105.2)	46.46 (1,180.1)
Snowfall inches (mm)	9.4 (238.8)	9.6 (243.8)	7.6 (193)	0.7 (17.8)	0.2 (5.1)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (2.5)	1.0 (25.4)	7.0 (177.8)	35.6 (904.2)
Avg. rainy days	11	10	12	11	11	11	9	9	8	9	11	12	124

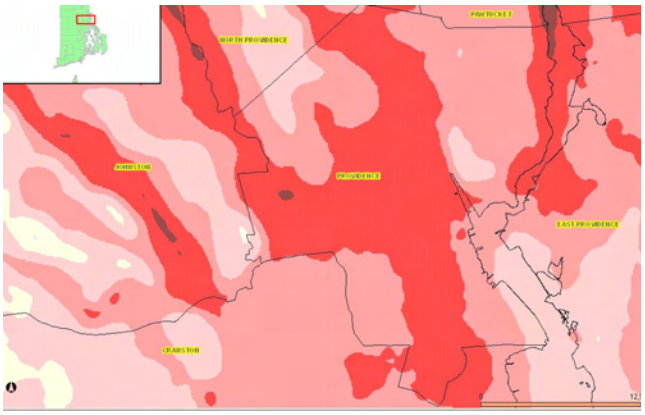
Source: The Weather Channel[35] Weatherbase.com[36] August 2009

http://en.wikipedia.org/wiki/Providence,_Rhode_Island
www.providenceplanning.org
http://www.rootsweb.ancestry.com/~rigenweb/carter.html



Providence _ rhode island





Above _ Temperature
_ Daylight
_ Humidity

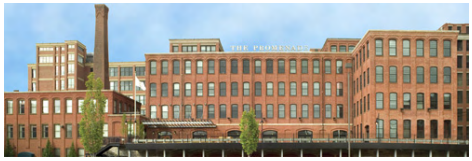
Left _ Providence RI
_ Wind Speeds

Below _ Historic Providence

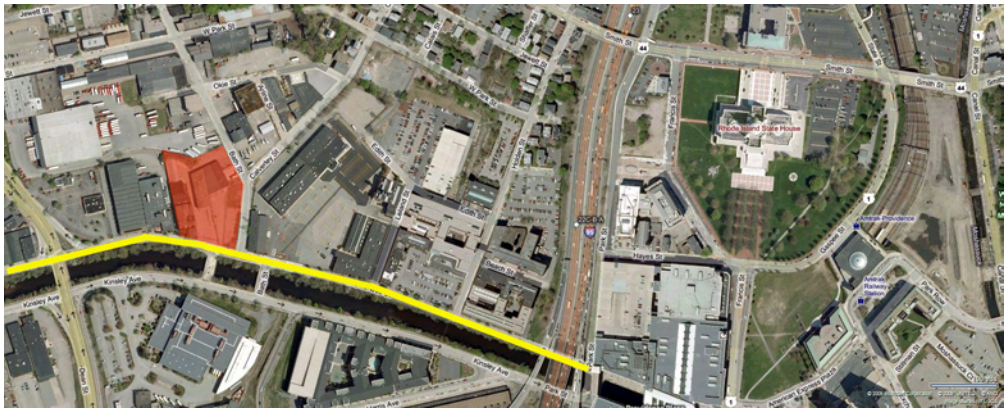
Promenade Street

Promenade Street borders both the historic district of Smith Hill and the Valley District, and is also known because of the river that runs along the historic street. Between the 19th and 20th centuries, the district became well populated since the river provided power for the industrial mills. The Promenade district consists of mostly smaller historic homes which are inhabited by a majority of white Europeans and some minorities. One large tower on Promenade Street is key of the city since the structure operates the trains and equipment for the city.

A master plan competition for Promenade Street has already occurred; the winning design has been completed but has not been implemented because of the recent economic problems. The river has been used to produce energy in the past and can still do that while creating a place for leisure. Promenade Street connects directly with Providence Place Mall and the Amtrak Station while curving around on the other end towards Westminster. Currently the street is filled with old mill buildings, some renovated and others abandoned. Some of the mills have been converted to housing but other parts of street include practices, medical offices, restaurants, cafes, shops and even a school. Though the street has many amenities, there is much potential for a better connection to the historic city center. Promenade Street along the river is rated a 91 out of 100 at [walkscore.com,](walkscore.com) because of the accessibility to the downtown necessities such as the mall, train and the State House. (providenceplanning.org)



Promenade Street - Redevelopment



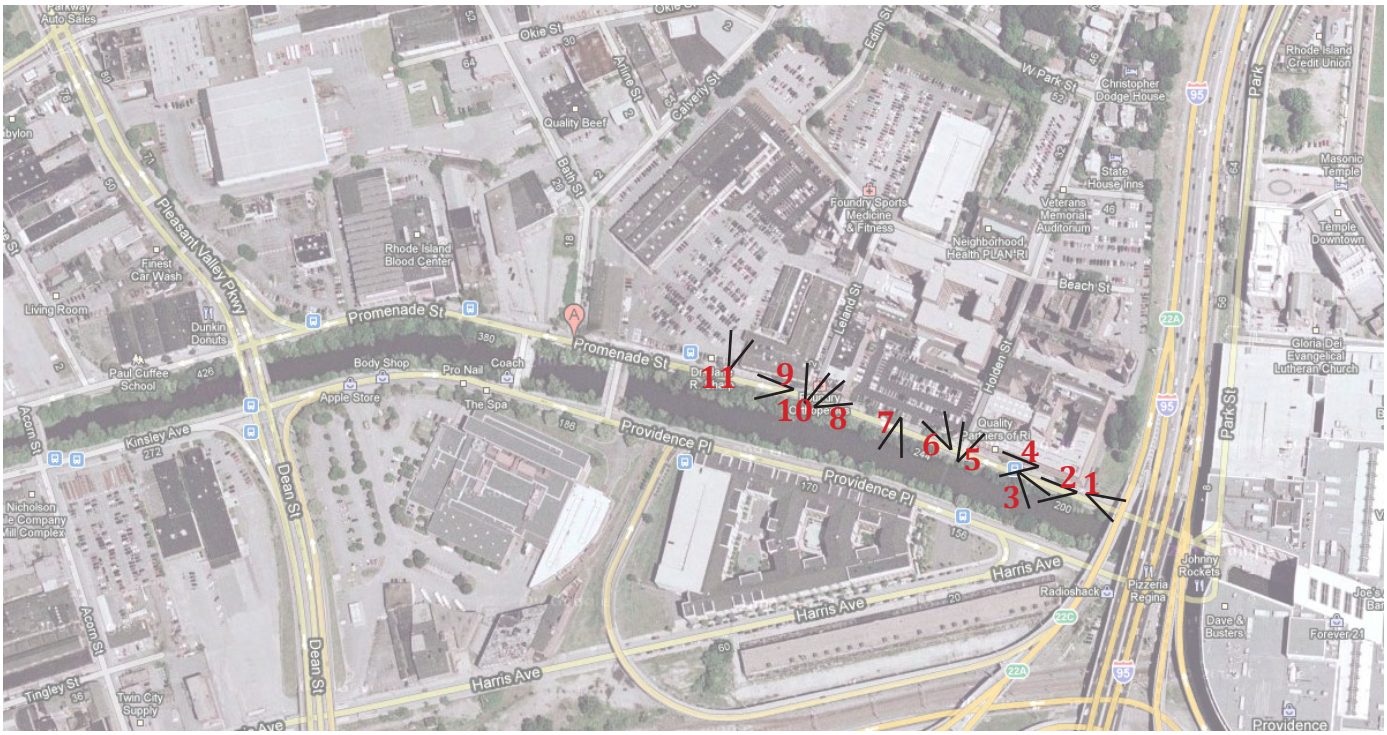
Positives

_ Near a waterway
_ Corner Site
_ Abandoned building (1/2) and Open Space (1/2)
_ Located near smaller family neighborhoods
_ Great connection to downtown and amenities
_ Retail and Residential on street
_ Taller zoning district to allow a taller building
_ Maximum Day Light from south
_ Pedestrian Bridge over River

Negatives

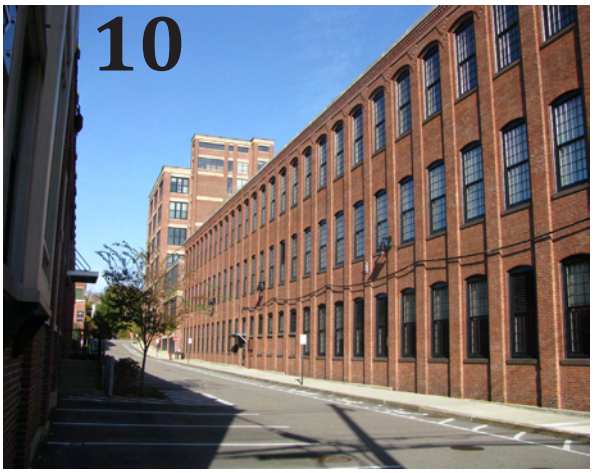
_ Commercial Buildings on road
_ One way street
_ Currently “forgotten”

Promenade Street Walking Tour


Okie St
Quality Beef
Bath St
Anne St
Calvert St
Edith St
W Park St
Christopher Dodge House
Rhode Island Credit Union
Park St
State House Inns
Masonic Temple
Foundry Sports Medicine & Fitness
Veterans Memorial Auditorium
Neighborhood Health PLAN RI
Temple Downtown
Beach St
Leland St
Holden St
Gloria Dei Evangelical Lutheran Church
Pleasant Valley Pkwy
Finest Car Wash
Rhode Island Blood Center
Living Room
Dunkin Donuts
Promenade St
Paul Cuffee School
Body Shop
Pro Nail
Coach
Apple Store
The Spa
Providence Pl
Kinsley Ave
Acorn St
Dean St
Nicholson Mill Complex
Quality Carriers of RI
Harris Ave
Radioshack
Pizzeria Regina
Johnny Rockets
Dave & Busters
Forever 21
Tingley St
Twin City Supply
Providence
1
2
3
4
5
6
7
8
9
10
11


8


9


10


11


12

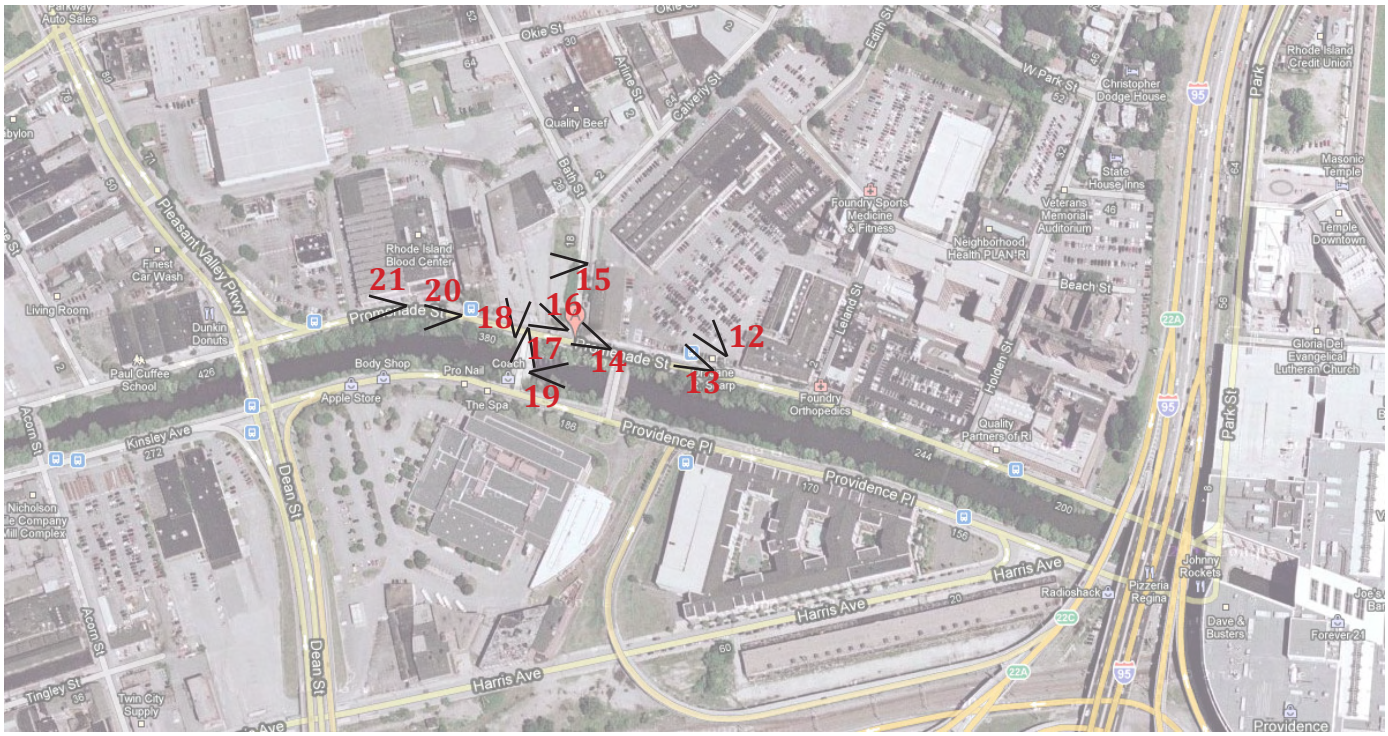

13


14


15


16


17
WOONASQUATUCKET
RIVER


21
20
18
15
16
17
14
19
12
13
Promenade St
Providence Pl
Harris Ave
Dean St
Pleasant Valley Pkwy
Okie St
Beach St
Park St
Quality Beef
Rhode Island Blood Center
Finest Car Wash
Dunkin Donuts
Paul Cuffee School
Body Shop
Apple Store
Pro Nail
Coach
The Spa
Foundry Orthopedics
Foundry Sports Medicine & Fitness
Neighborhood Health PLAN RI
Veterans Memorial Auditorium
State House Inns
Christopher Dodge House
Rhode Island Credit Union
Masonic Temple
Temple Downtown
Gloria Dei Evangelical Lutheran Church
Quality Partners of RI
Kinsley Ave
Tingley St
Twin City Supply
Radioshack
Pizzeria Regina
Johnny Rockets
Dave & Busters
Forever 21
Providence


18


19

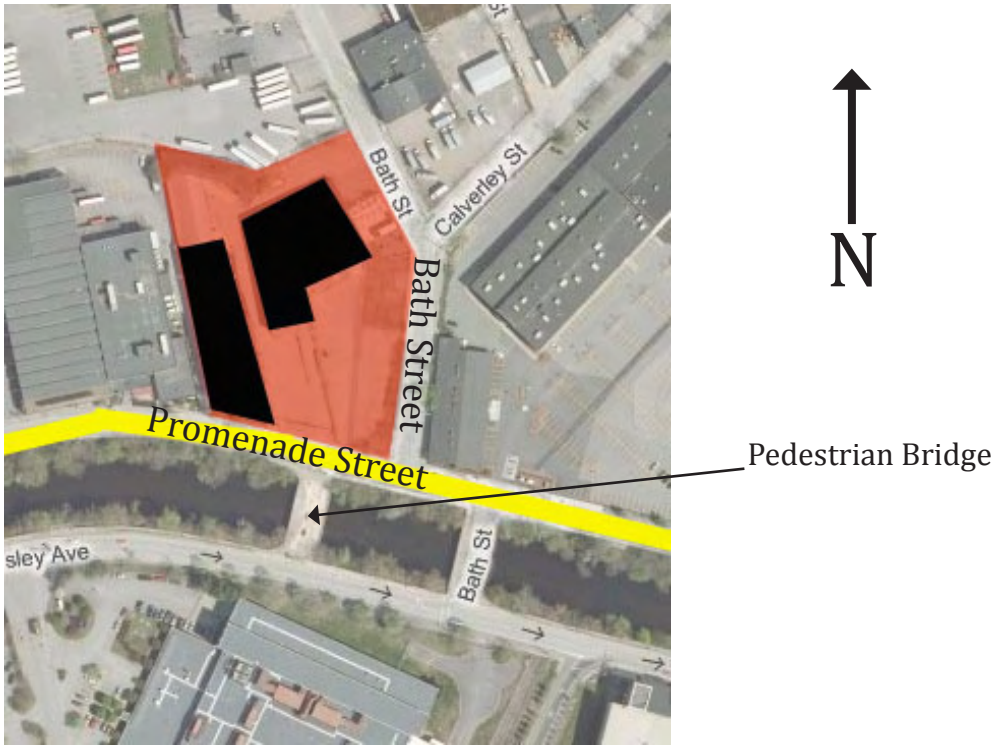

20


21

Site: Analysis

A site on the corner of Promenade Street and Bath Street fits my criteria and certainly needs some improvement, not just the site itself but the connection into downtown Providence. The two abandoned buildings on the site seem to have been built separately during two different eras, but they are connected towards the back corner of the site. Bath Street gently slopes down towards the water and, at the top of the hill; the residential neighborhood of Smith Hill begins and continues up the hill. This slope affects the site and is useful when it comes to runoff and water management since it runs down into the waterway. The waterway on the other side of the road connects the site with the water as well as the potential to clean the river water. Across from the site there is also a pedestrian bridge that spans the river as well as celebrates the history of the site and river.

Promenade Street and the river on the south side of the site allow the site to gain the most sunlight during the day since there are no other buildings blocking it. The water is an excellent noise barrier from the street, and the Promenade apartments and offices seem to block most of the noise from the highway down the road. On the north of the site are a couple businesses ;Promenade Street proceeds up the hill with views of single family homes.



Promenade Site - Existing Conditions

Promenade Street _ highway and PP

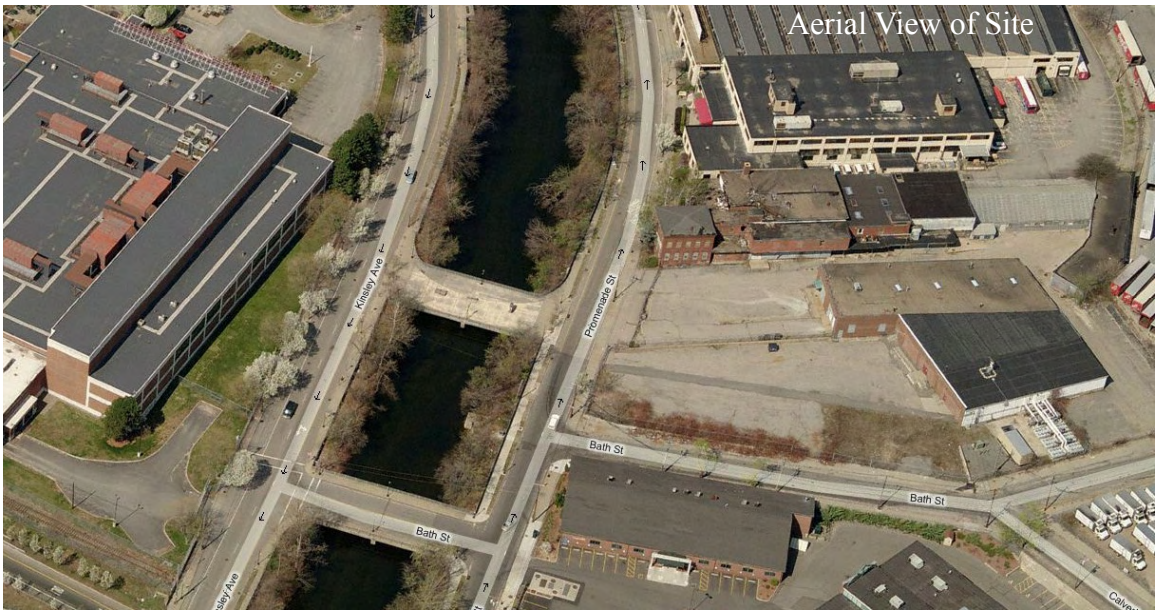
Bath Street _ looking at Promenade

River _ looking away from the City

Creating a sustainable community is difficult since there is so much to consider. There are many examples of these types of communities in our world today, but this community has found a way to succeed using a smaller piece of land, moving closer to the city center and creating a place that can be enjoyed by the whole community. Eco-Village Ithaca was studied immensely throughout the design process since they have a successful community and are currently building their third community. They work together and create a community among each other by helping each other out to survive which is a huge aspect of this project. The issues that are found at Eco-Village Ithaca is the amount of land that they use compared to the amount of housing they have. The ratio is uneven, though they do a lot of farming on the rest of the land to support the community. Also, living outside the city becomes less sustainable since it forces you to invest in your own transportation when public transportation is not available. The Rising Residence is located in the city, near all the essential amenities, and public transportation is available via bus, train or taxi throughout the whole city. It will be easy to travel throughout the city and the site uses much less land since it occupies vertically instead of horizontally. Eco-Village is an excellent example and reference, but the Rising Residence will solve and bring their community to a new level; the city! These site comparisons below were calculated at the same scale, huge difference in land use!

Land Use Housing

Eco -Village Ithaca / Providence Site Comparisons

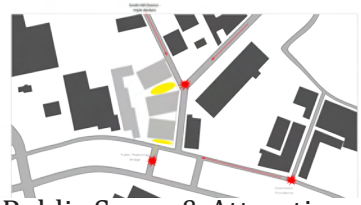


Existing Perspective from Pedestrian Bridge

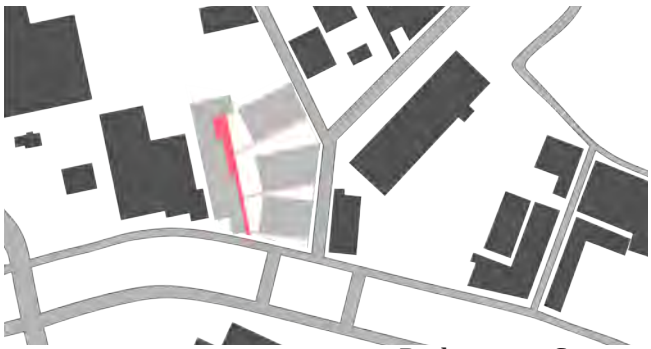
The site is located on a one way street leading away from the Providence Place Mall. There seems to be a lot of vehicle traffic, but minimal pedestrian traffic. Since there are many commercial buildings in the nearby area, creating a community friendly environment is much needed. On the other side of the river and at the beginning of the road are two large apartment buildings that are fairly new. Keeping the long narrow building on the west side of the site,allows for the historic culture that once thrived on Promenade street to continue. Since the south is closer to the river, keeping that portion of the site open would allow the most light the rest of the site. The tower is placed in the most south-western part of the site, allowing for plenty of sunlight to the rest of the site without the over powering shadows left behind by tall sky scrappers. The housing strategy was also primarily based on the sun angles and the southern exposure for the gardens. The row houses and tower are directly to the south of the private gardens that are found in each unit. This allows for again the most direct sunlight on the garden spaces for the residents. These basic ideas and strategies were found useful from the start, which led to the idea of creating a pedestrian street along the existing building to make it more like a promenade or store front within the sustainable community. The views from the tower will be incredible as you can watch the sun rise and set over the city from your front balcony.

Promenade Site - Existing Conditions

Figure Ground



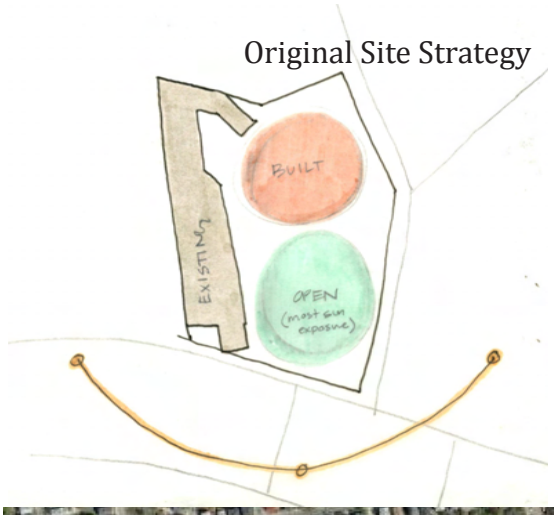
Public Space & Attractions



Pedestrian Streets

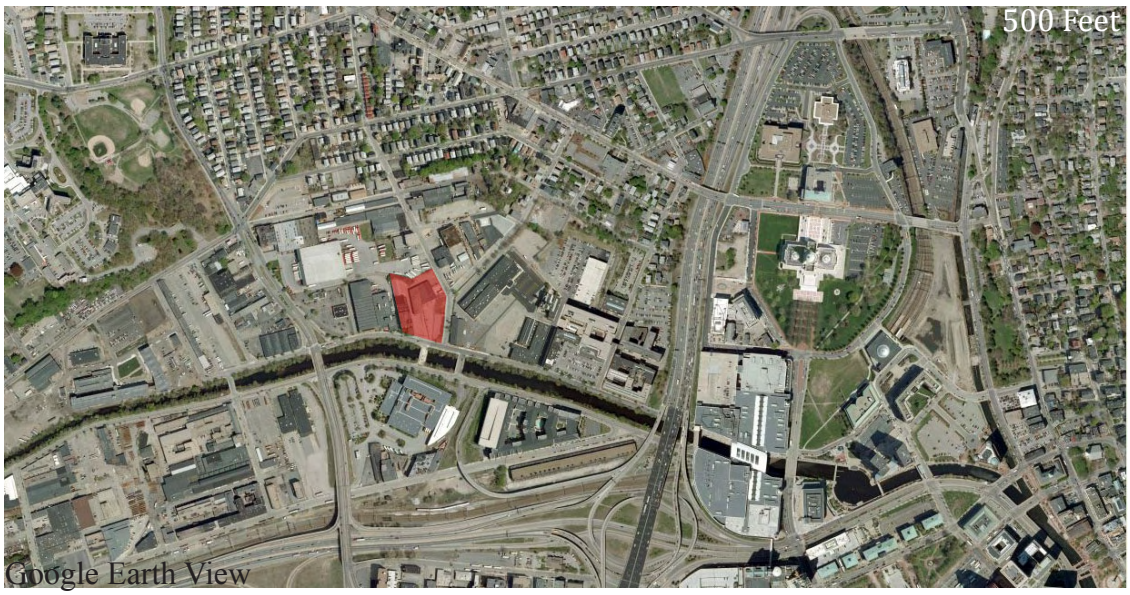
Pathways

Original Site Strategy



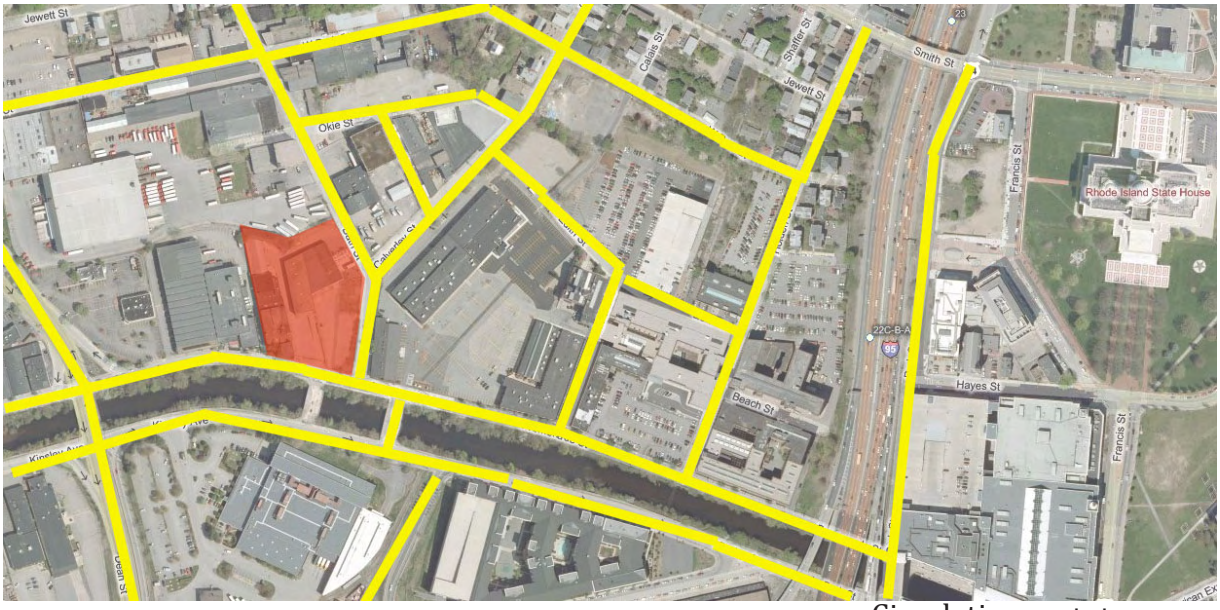
Original Housing Strategy

Google Earth View

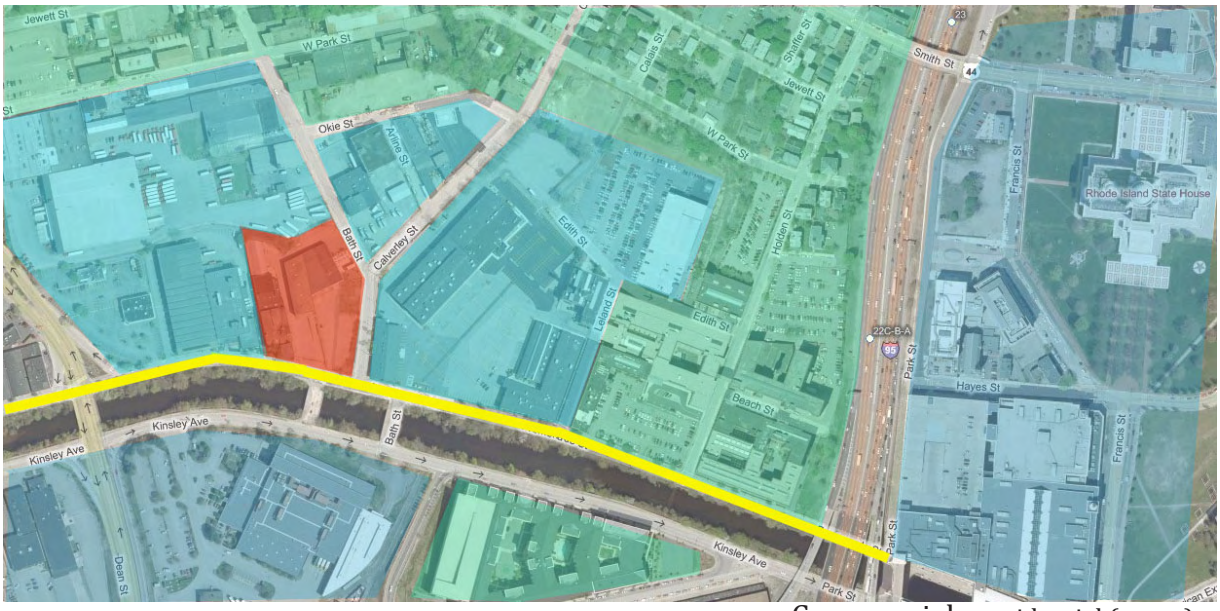


Google Earth View

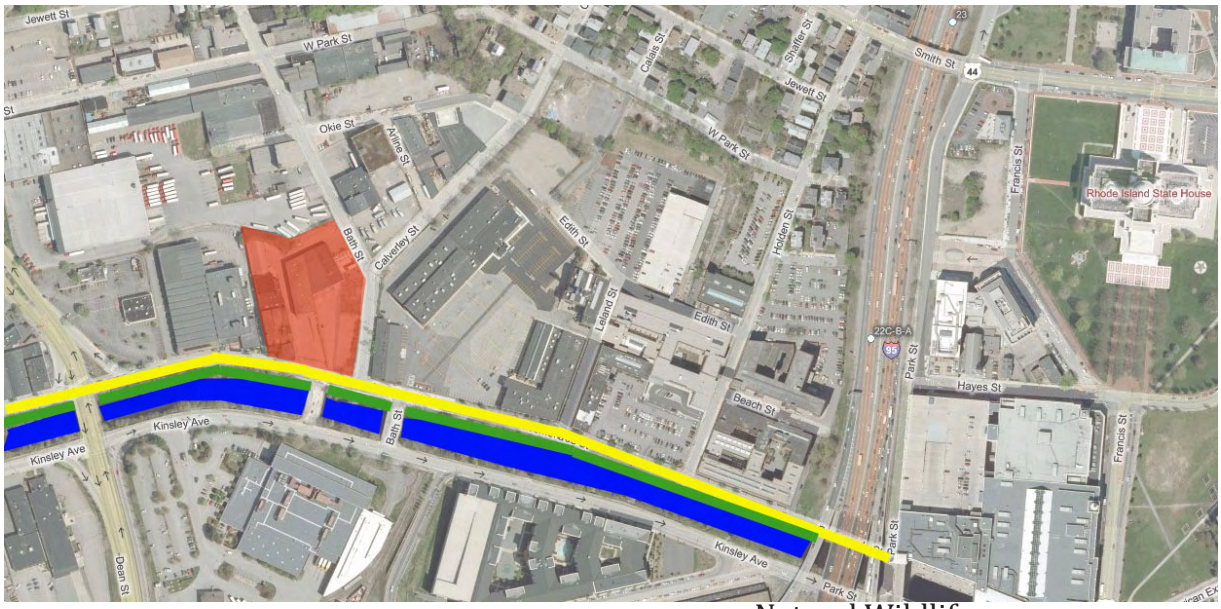
Figure Ground _ existing buildings



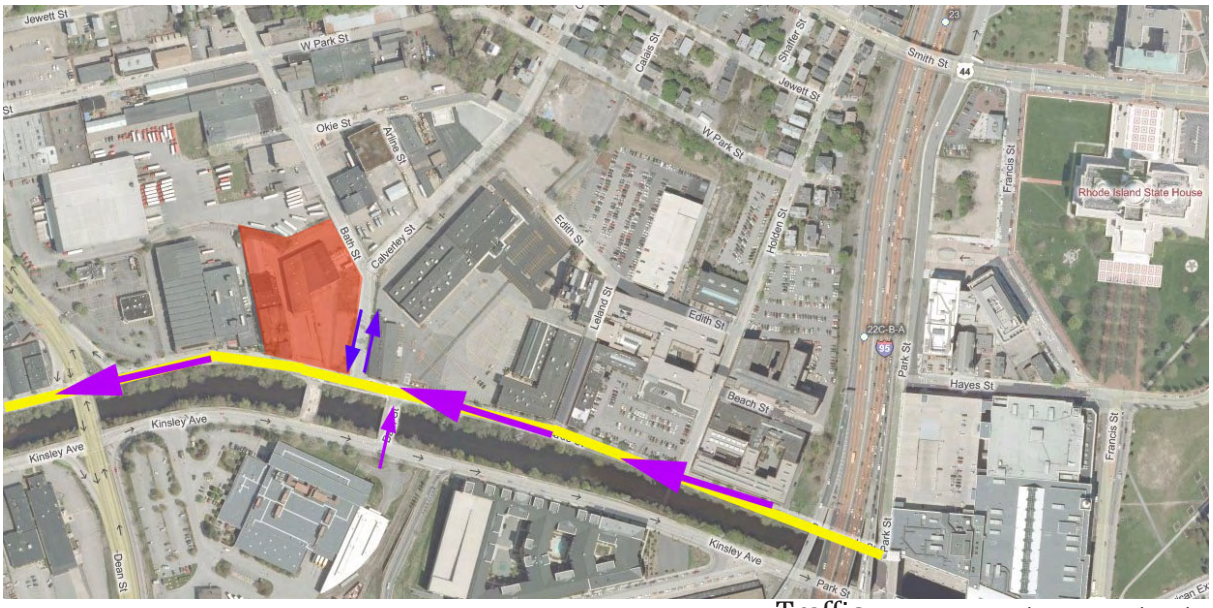
Circulation _ existing streets



Commercial _ residential (green)



Natural Wildlife _ street, green, water



Traffic _ one way vs. two way streets

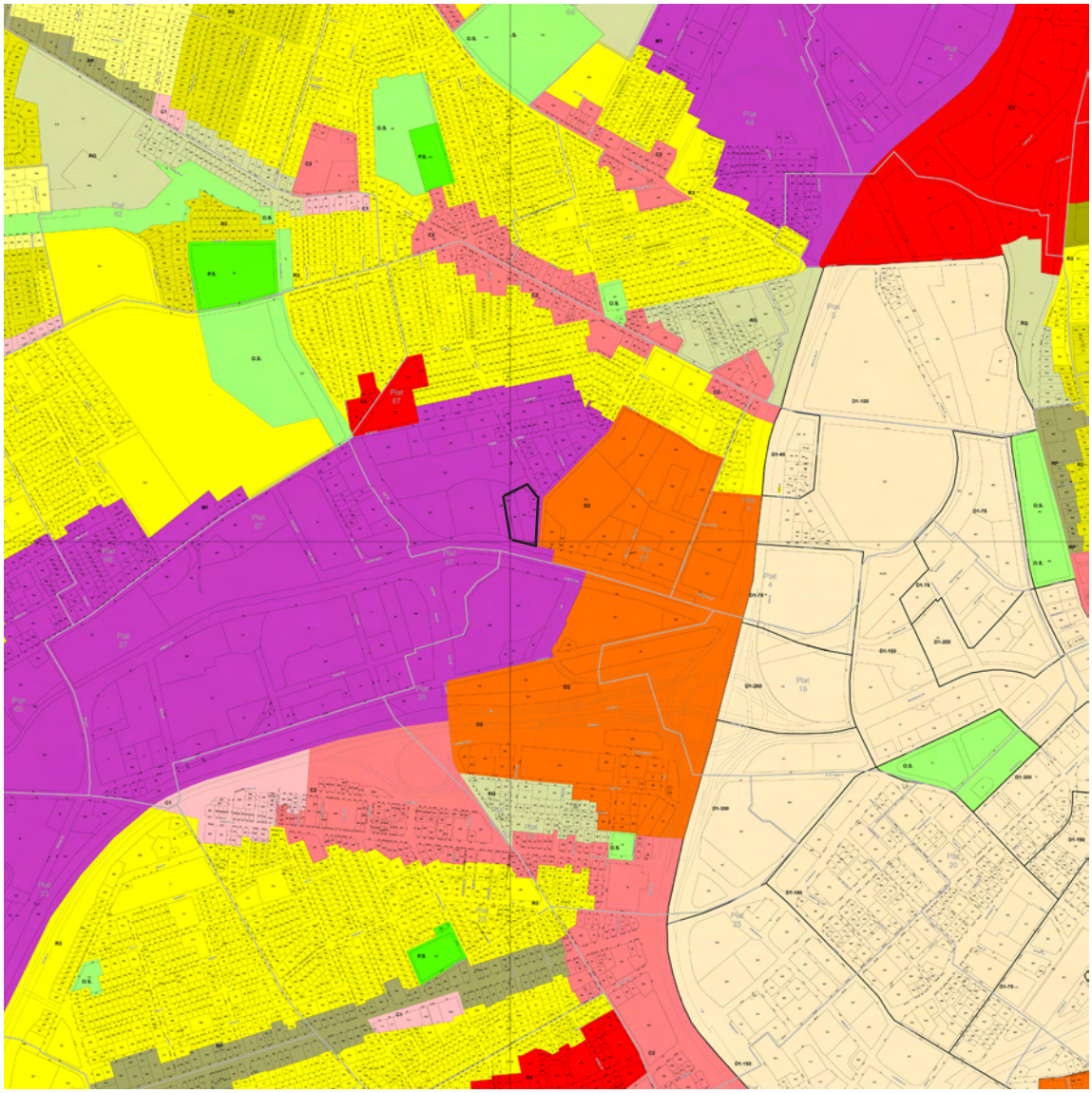
Site: Regulatory Environment Summary Report

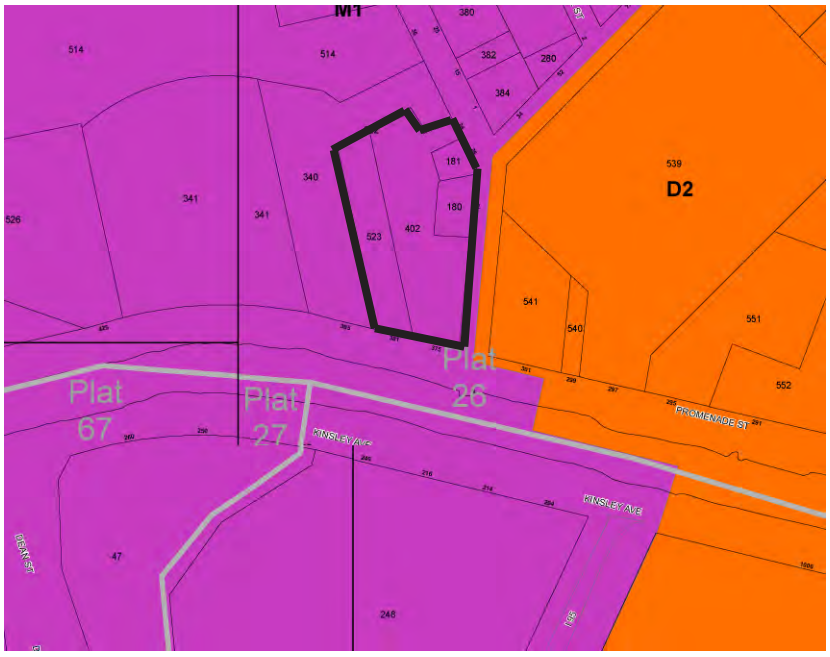
M-1: Industrial District

Multi - Family Dwelling

_ Minimum of 5,000 square feet gross floor area required for new construction
_ Trash pickup area mandatory
_ Bituminous paving materials
_ Screen exterior utilities with vegetated screen on 3 sides
_ Min. 15% of lot, trees/greens (canopy coverage)
_ Demolished buildings can be replaced at the same size
_ Solar use okay, if pointed away from main street (side/rear yard)
_ Swimming pool not allowed in front yard or side yards
_ 18 foot setback to garage from street
_ Car port must be less than 10 feet and less than 20 feet in length
_ Appurtenances are not allowed more than one-third of the total roof area
_ Upper floor balconies or overhangs (up to 4-6 feet)
_ Fire escape (no more than 4 feet into side/rear/front yard)
_ Patio or ground level deck, must be below 8.5 inches
- Exterior lighting, all downward facing or directed at building
_ No removal of significant trees if healthy

Max Height – 75 feet or 6 stories
Min. Lot Area – None
Min. Lot Area Per Dwelling Unit – 1,200 sq. ft.
Min. Lot area per Rooming Unit – none
Minimum Front Yard - 0 feet
Minimum Side Yard – 0 feet
Minimum Rear Yard - 0 feet
Maximum Lot Coverage - none




M1
D2
514
514
380
382
280
384
181
180
340
341
341
526
523
402
539
541
540
551
552
Plat
67
Plat
27
Plat
26
PROMENADE ST
RINSLER AVE
47
246

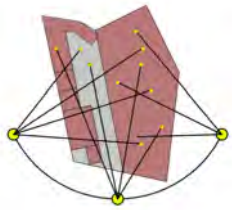
DESIGN PROCESS: Initial Ideas

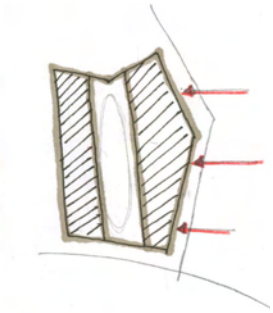
Starting off the design process with a collage allows the project to come to life before applying hard lines and exact details to the project. A collage expresses the intent and abstractness of the project through your brain and imagination. The vision of this collage is a large building that creates interesting moments, coverings and shelters. By using green trees, it shows that the project has an intention of being green, alive and maybe edible. The views and experiences that are seen in the collage are expected and anticipated in the final design.

Four main concepts were studied initially which were referred to as; STREET, TWO STREETS, BACK and TOWER. The sun angles needed to be studied to ensure that every part of the site had an adequate amount of sunlight throughout the day. Approaching the site and moving through the site was also a concern, since it is a corner site, and people from all directions would be entering or passing through the site. It needs to be convenient and accessible for everyone from various locations.

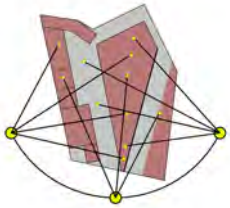
Site - Google Earth

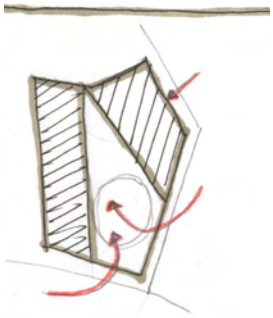
Site - Figure Ground



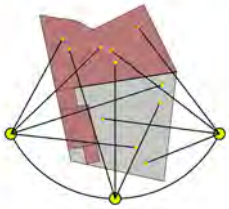


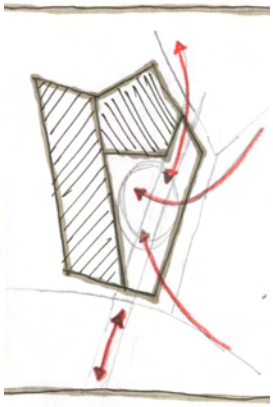
STREET



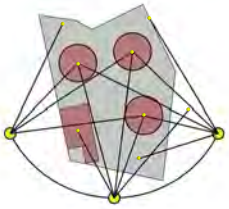


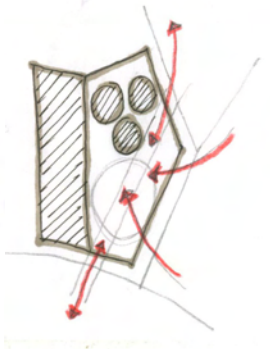
TWO STREETS



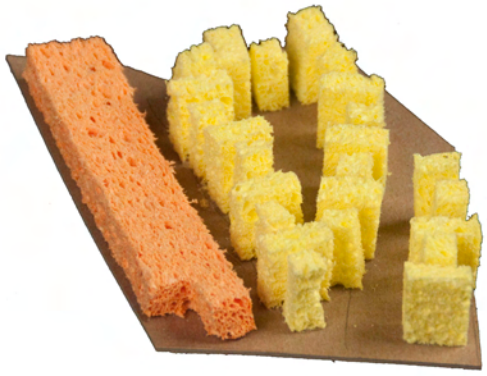


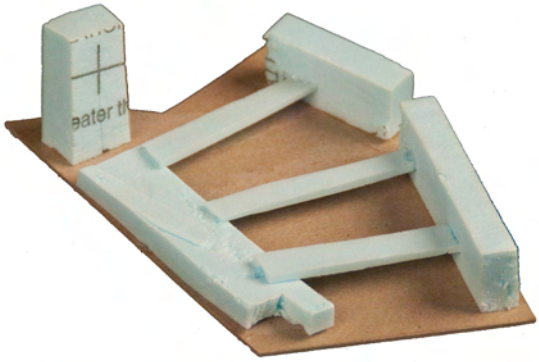
BACK

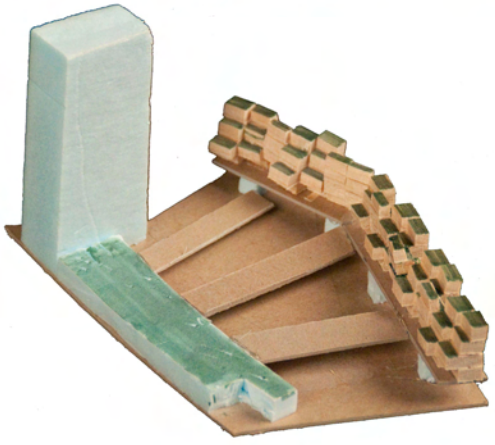




TOWER







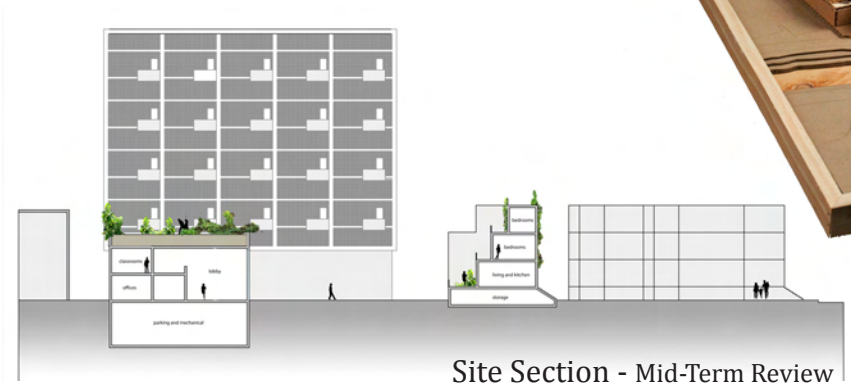
Initial Concepts - Diagrams

Initial Study Model Ideas

Photo By: Kyle Bendle

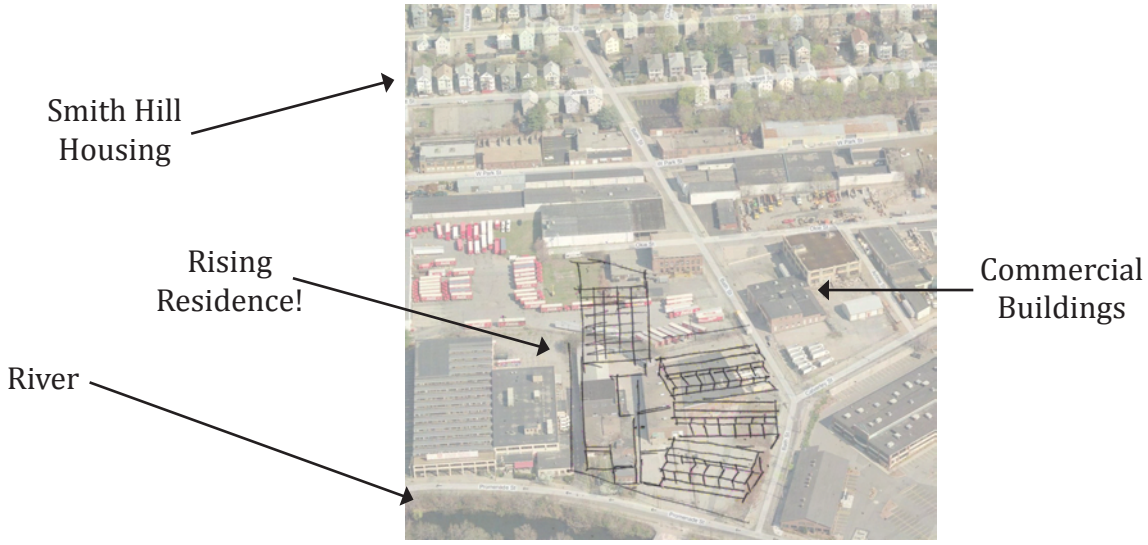
Using these four initial concepts led to a design that combined both the street and tower idea. Creating a tower on the west side of I-95 is intended to integrate the forgotten part of the city with downtown. It will also allow for many views and lots of vertical gardening - the future of city farming! Also, next to the existing building a pedestrian street was adapted to create a store front street between the public building which is the existing building and the residential row houses.

Site Model - Mid-Term

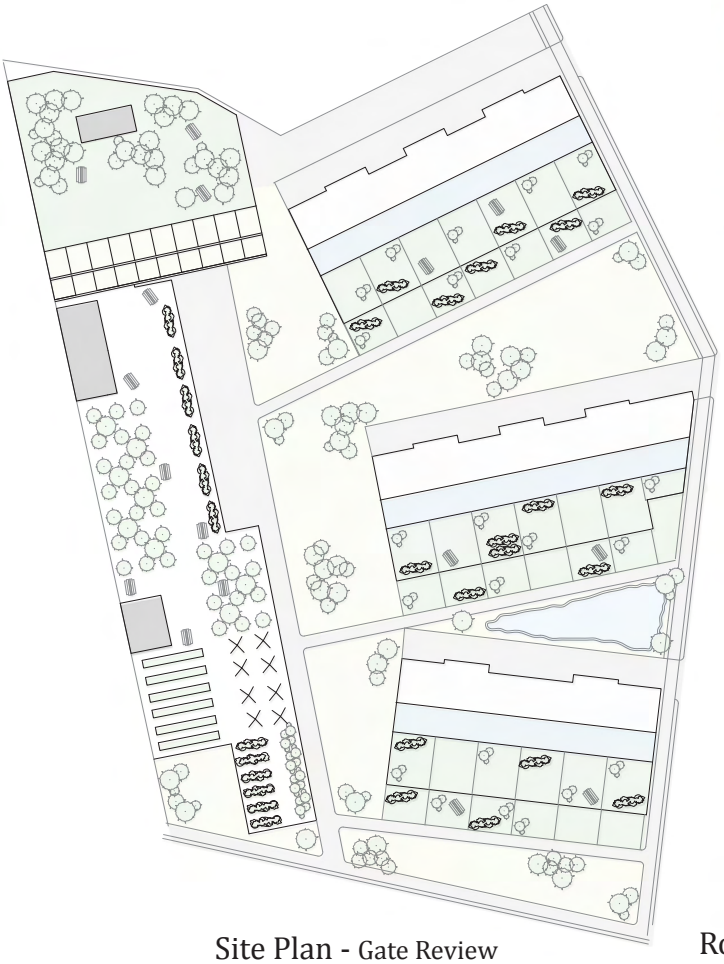


Site Section - Mid-Term Review

The tower was placed in the southern western corner of the site, furthest from the streets while not blocking any sunlight from the remainder of the site. How tall the tower should be started to become the biggest issue in the project. To create the typical American House, Row Houses were built on the eastern side of the site with parking in the rear and gardens in the front. They seemed to have changed directions, positions and heights many times but eventually the design consisted around the best angles, most privacy and plenty of sunlight. The whole site has plenty of public space and garden spaces as well as gardens in each unit.



Promenade St. Perspective - Gate Review



Site Plan - Gate Review

Row house & Tower Options - Models

Photo By: Kyle Bendle

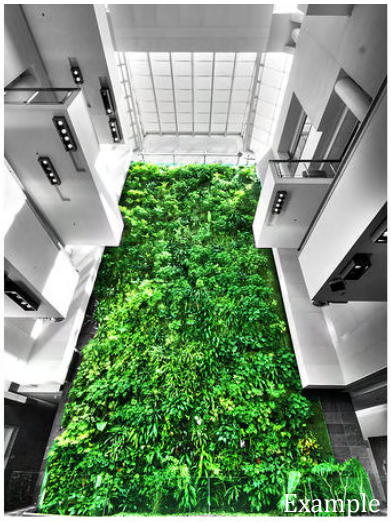
Existing Building

The existing building on the site is an older historic brick building that stretches from Promenade street all the way to the rear of the site. Currently, the interior of the structure is beaten up and needs to be completely renovated. It reaches about thirty feet, allowing for two interior stories and a thick vegetated roof used for gardening. On the ground floor of the existing building is where the public can explore and learn about gardens. There are rentable community rooms, hydroponic gardens, market spaces and administrative offices. The second floor is where the educational classrooms are located, which allow the community to learn how to seed, grow and store all types of foods.

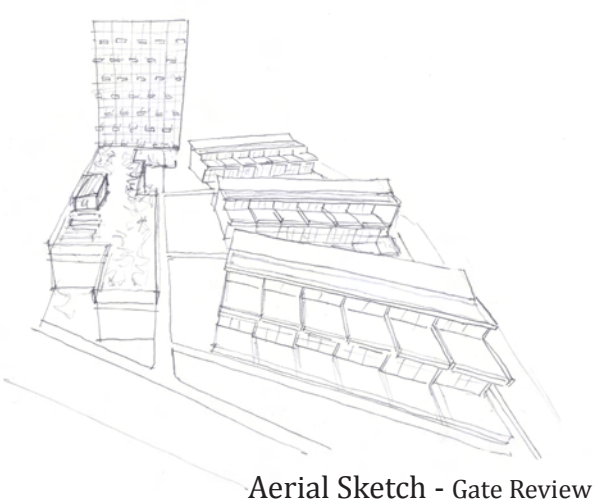

Example


Example

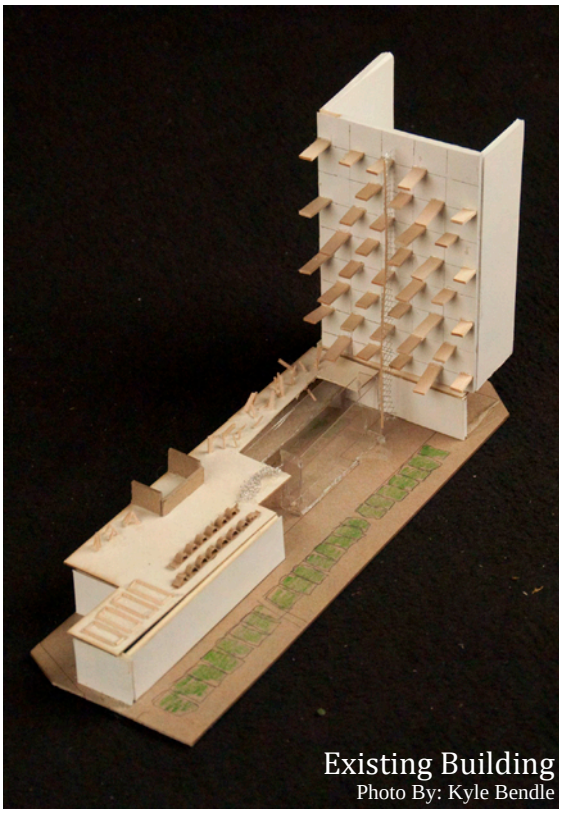
The market spaces and gardens on the ground floor of the existing building is the center of the whole project. The paths lead to this space and it is also the main entrance to the educational building, housing tower and public gardens. It is an important space that needs to be recognized and remembered by all. A large living wall or garden is ideal, since it draws peoples attention as well as makes them interested by the grand landmark. Drawing peoples attention to the site is the beginning of starting a brighter and more sustainable community. People need to learn how to be sustainable and grow there own food, and this is where all that can happen by either taking classes or just wondering and exploring the gardens on site.


Example

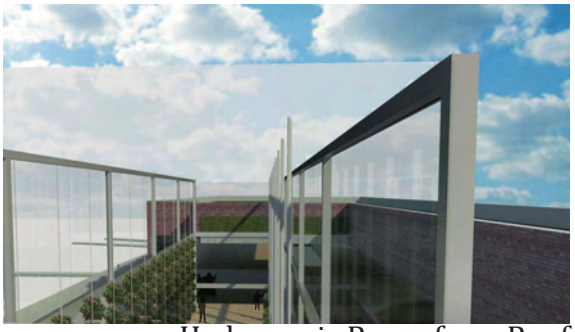

Example



Aerial Sketch - Gate Review



Existing Building
Photo By: Kyle Bendle



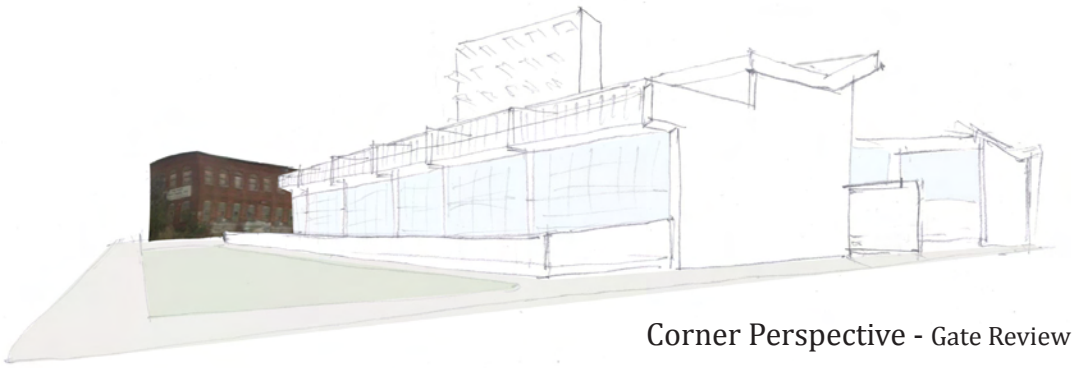
Hydroponic Room from Roof

Ground Floor Plan - Gate Review

Second Floor and Roof - Gate Review

Row Houses

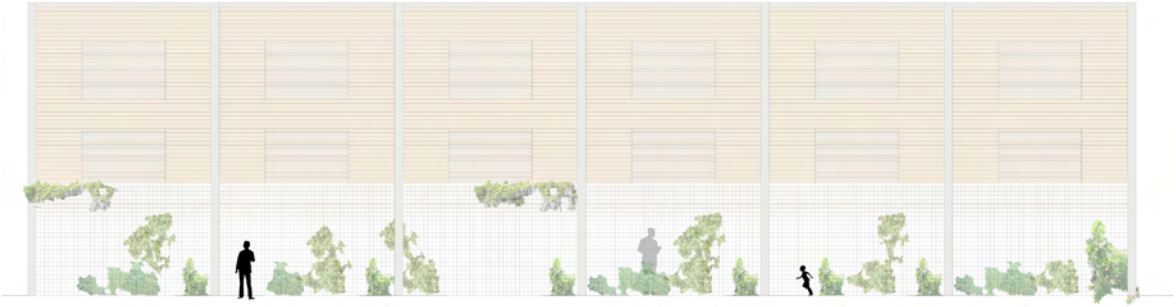
On the ground level of the site are where the row houses are located. They are all the same size and each have one car port. The two bedroom units only take up two floors, so there would be two families living in one row house but they both have separate entrances and car ports. On the south side of the row houses is where the garden is located, which is raised 2 feet above the ground level, separating the private residents gardens from the public paths. The living room, dining room and kitchen are located off of the garden in a large open space on the first floor which turns into a double height space on the south end. On the upper floors is where the bedrooms are located with another garden patio on the third floor. The roof is slanted for the opportunity to collect rain water and use it to irrigate the gardens in the units.



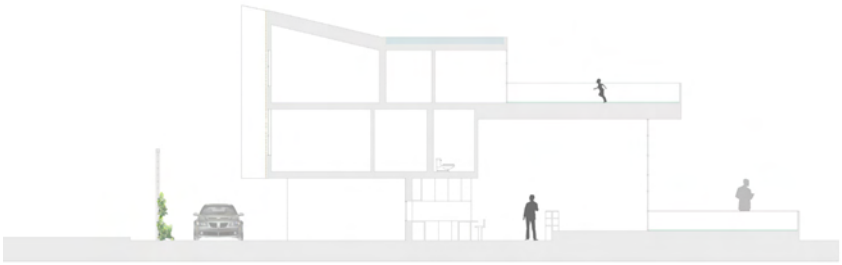
Corner Perspective - Gate Review

The main entrance in the unit is on the north end of the unit where the covered car port is located. The narrow street behind the units is surrounded by a large screen or fence that allows for the opportunity to grow food and flowers on, so it becomes blocked and privatized from the public. The south facade is made up of a glass wall, to allow lots of natural sunlight into the building. The structure is made out of concrete and the other facades are covered with wooden panels.

The double height spaces and balconies throughout the row house allow for better ventilation. With operable windows these spaces would stay cool and the section would allow for continuous air flow. The sun, sustainability and air flow were inspirations to this design.

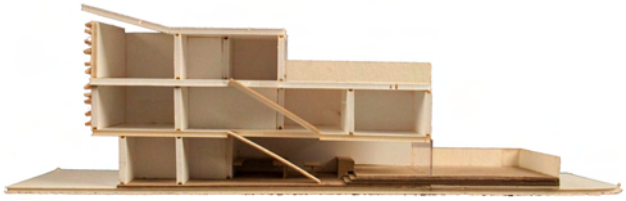


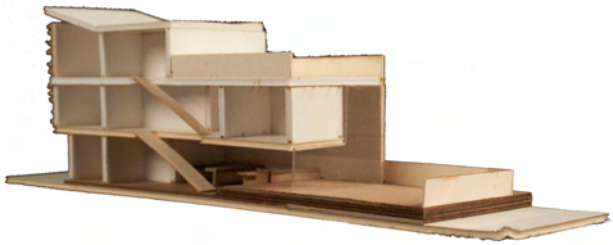
Row House Elevation - Gate Review

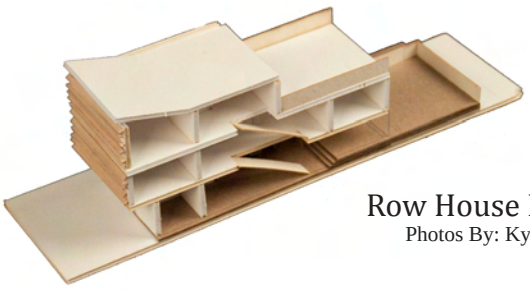


Row House Section - Gate Review

Row House Section - Gate Review



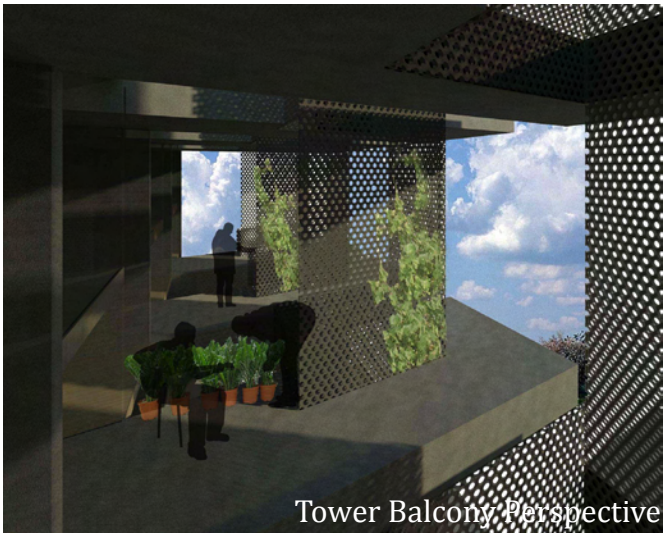




Row House Model
Photos By: Kyle Bendle

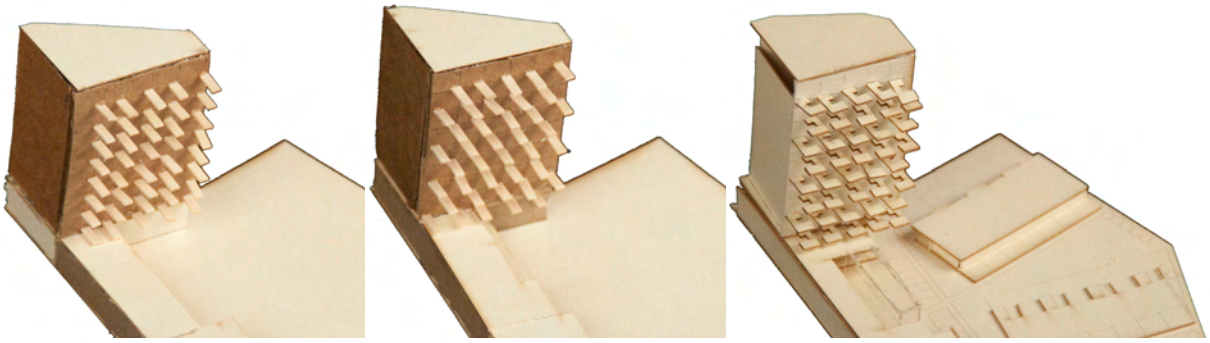
Tower Units

In the back south-western portion of my site is a residential housing tower. The tower is meant to be a new type of vertical living. The units are two stories except one unit on each level which is handicap accessible and only one level. Each unit has a separate entrance but the units all share two staircases and elevators. One parking spot for each unit is reserved is the parking lot below garden which are connected to the stairs and elevators for easy access. Each unit has a double height space, a sun room and a garden. The common rooms are located on the lower floor with the bedrooms on the top floor. These units are laid out and very similar to Row Houses that are found on the street level.



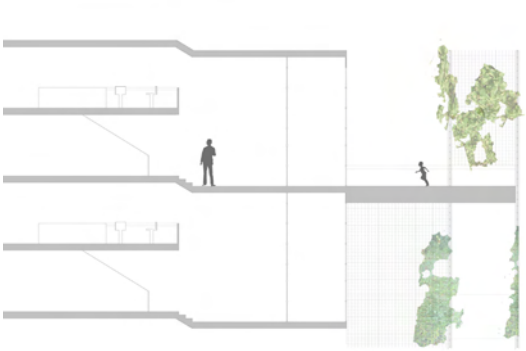
Tower Balcony Perspective

The balconies that protrude off the southern part of the facade have been designed to allow the most light into the apartments as well as plenty of sunlight on the balconies for the gardens. The screen systems has also changed multiple times, going from a flat vertical screen to a square screen that opens up to allow the residents to look down to the ground floor of the project. The screen system is also structural helping out with the support and structure of the balconies. Though it took some time for the balcony system to be designed, there were many models and renderings made to find the perfect sun angles for gardening.

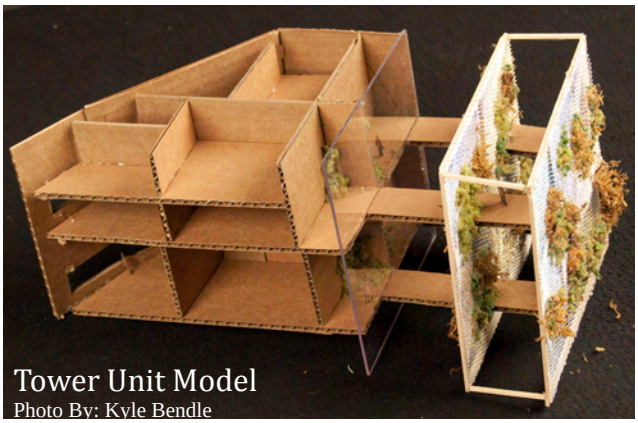


Tower and Balcony Study Models

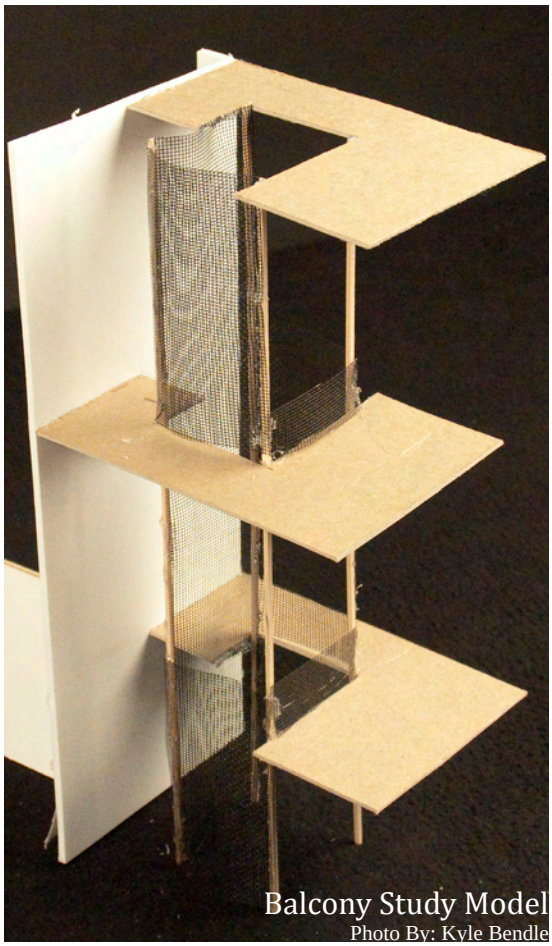
Photos By: Kyle Bendle



Tower Unit Section - Gate Review

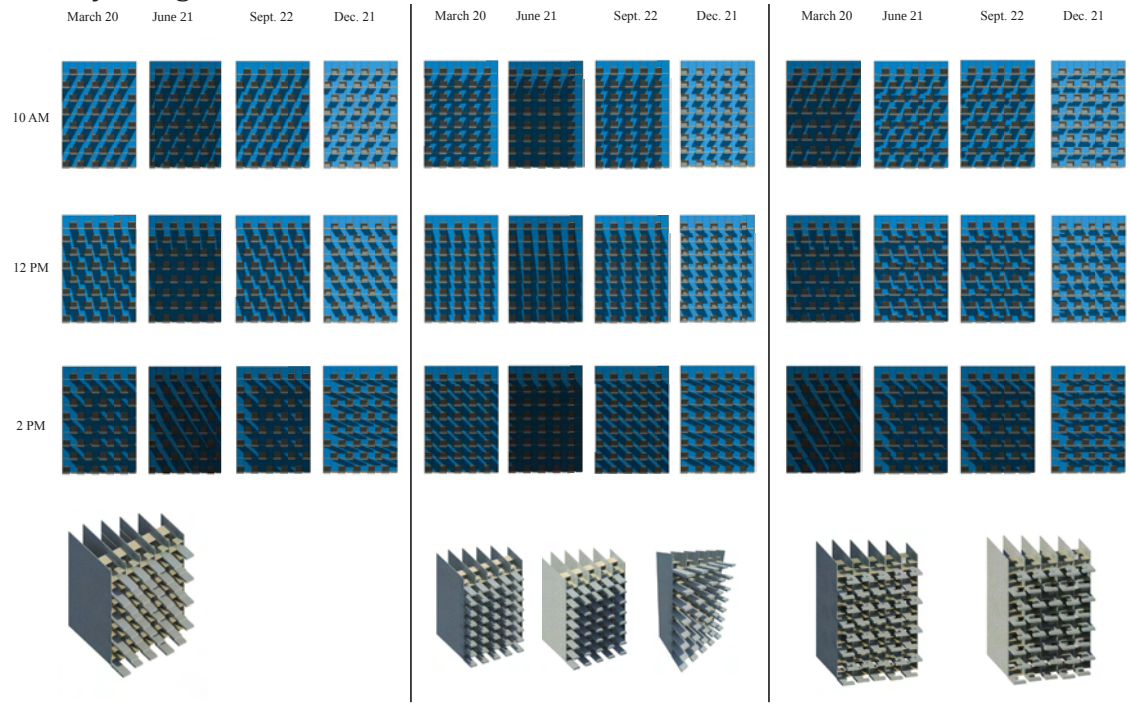


Tower Unit Model
Photo By: Kyle Bendle



Balcony Study Model
Photo By: Kyle Bendle

Balcony Design - Sun Studies



Gardens

The site is filled with both public and private gardens. The project is based upon sustainable living and different varities of gardening. Many pictures and examples were looked at as inspiration when designing these garden spaces! Most of the private gardens in the units are designed to be flexible so that any family can move in do whatever they want in there exterior area. Some people are more advanced with gardening and might fill their whole yard with planters and trees where as other families with kids might want to leave some room open for a picnic table and soccer goal. Though the intention was created around gardening, not everyone is into it. Living in this type of community will give you access to all sorts of fresh foods and fruits, so there is not always a need to put more gardening in your own yard. The opportunity it left up to the occupant, but hopefully everyone will be able to learn, thrive and enjoy the edible vegetation throughout the site.

Vertical Garden Inspirations

Unit Garden Models
Photos By: Kyle Bendle

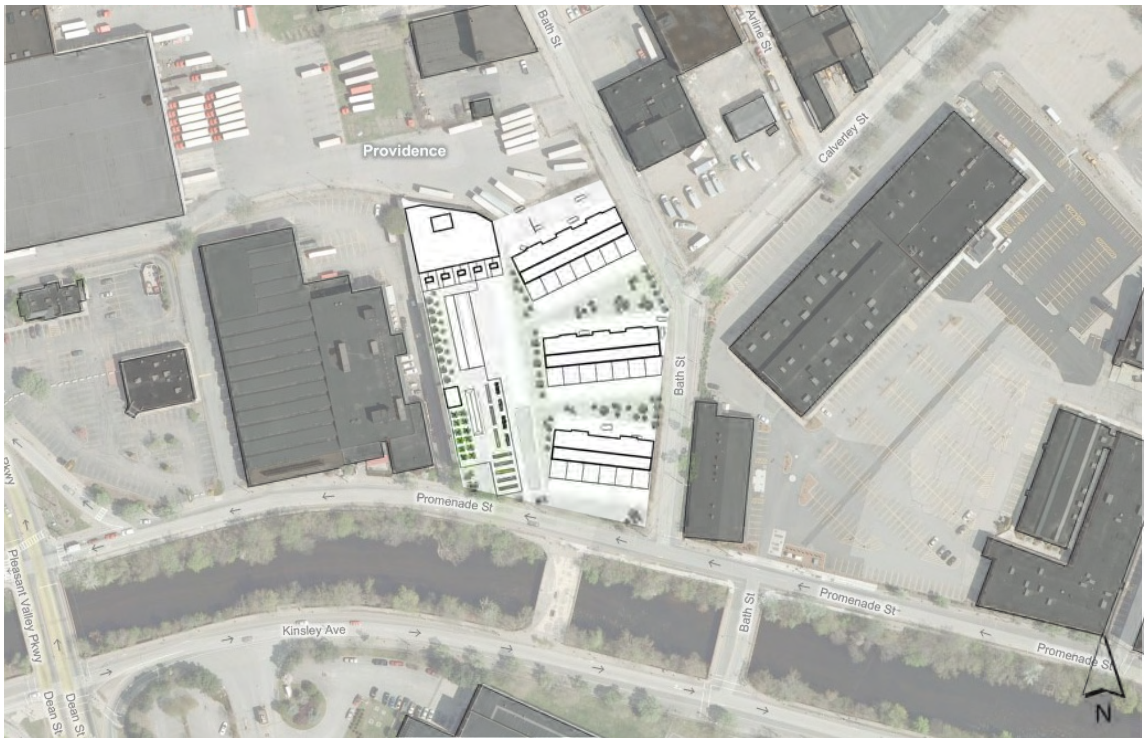
Final Independent Thesis Design

Site

Private Housing
Public Spaces

Green Spaces

Pedestrian Paths
Parking



Site Plan
1/256" = 1' - 0"

Ground Floor Plan
1/64” = 1’ - 0”

Existing Condition from the Pedestrian Bridge

Pedestrian Bridge Perspective

Bath Street Entrance Perspective

Corner Perspective

Existing Building

Second Floor Plan
1/128” = 1’ - 0”

Roof Plan
1/128” = 1’ - 0”

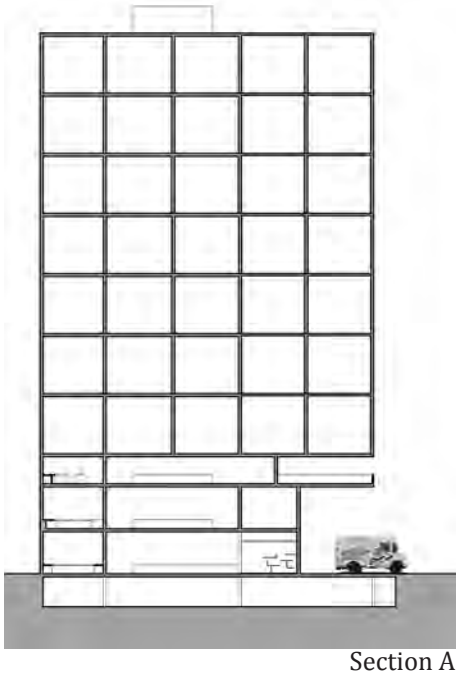
Basement Plan
1/128” = 1’ - 0”

Program Separation

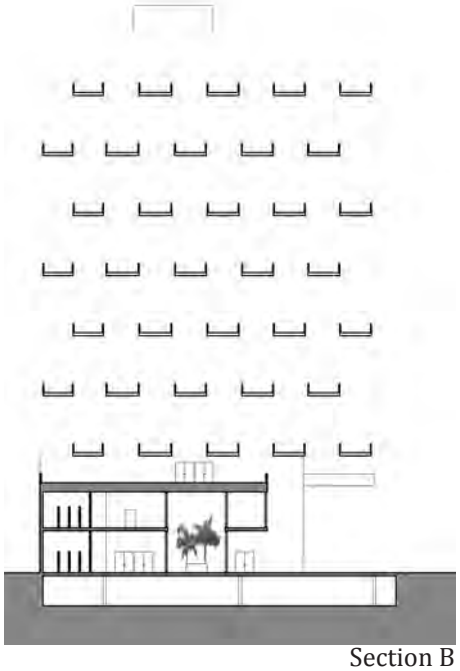
Egress and Main Hallway

Section F
1/32” = 1’ - 0”

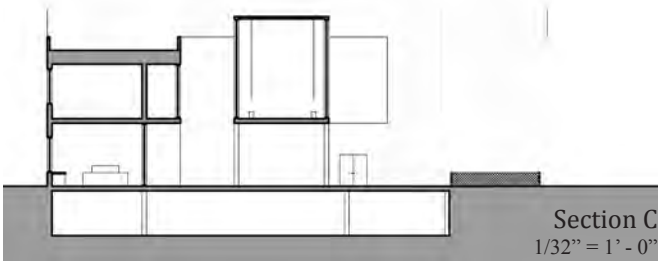
Structure and Main Entrances



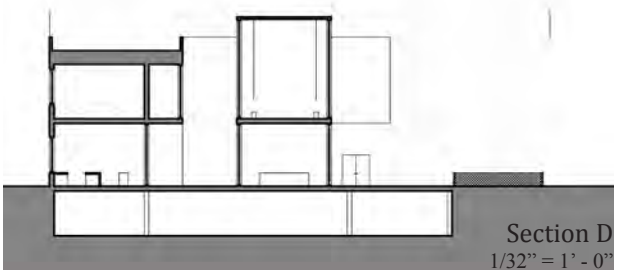
Section A
1/64” = 1’ - 0”



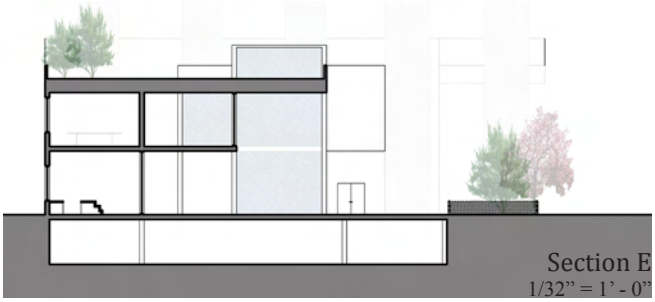
Section B
1/64” = 1’ - 0”



Section C
1/32” = 1’ - 0”



Section D
1/32” = 1’ - 0”



Section E
1/32” = 1’ - 0”

View from Ground Level

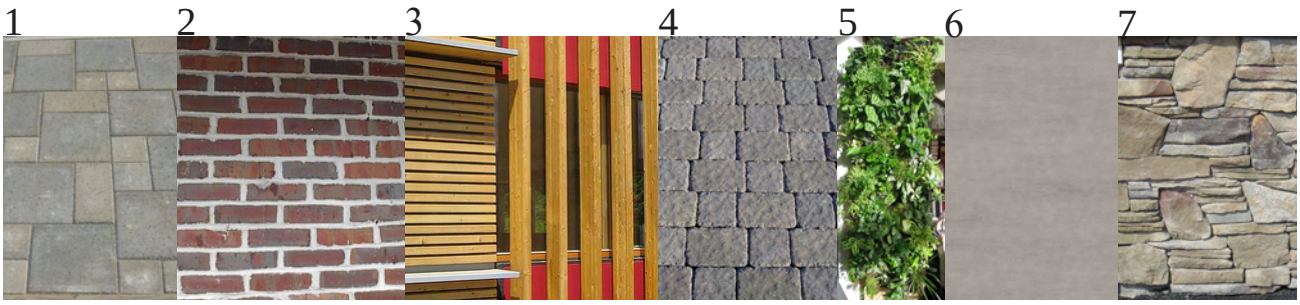
Second Floor View

Ground Level Market Spaces and Hydroponics

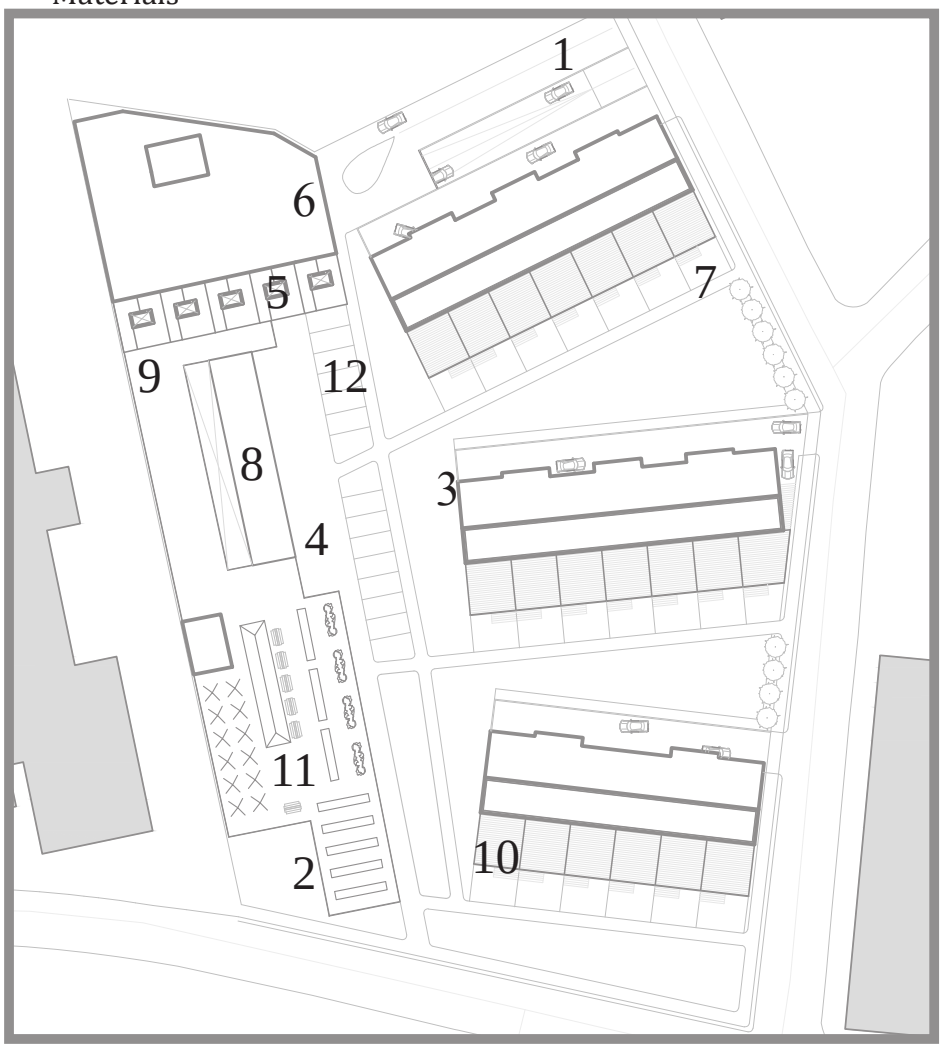
Public Hydroponic Rooms

Site Section
1/128” = 1’ - 0”

East Elevation



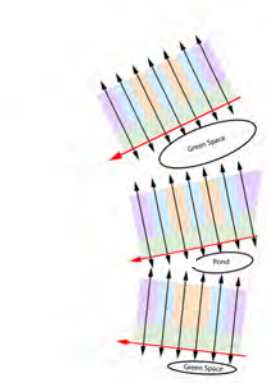
Materials



Row House

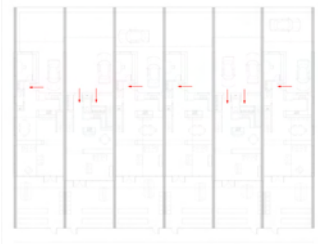
16	Two Bedrooms (blue)	=	32 Beds
6	Three Bedrooms (orange)	=	18 Beds
6	Four Bedrooms (purple)	=	24 Beds

Total: 28 Units and 74 Bedrooms

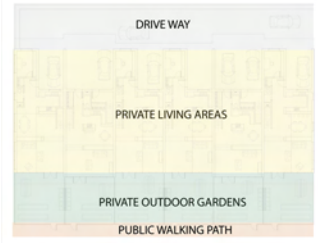


Green Space vs. Housing

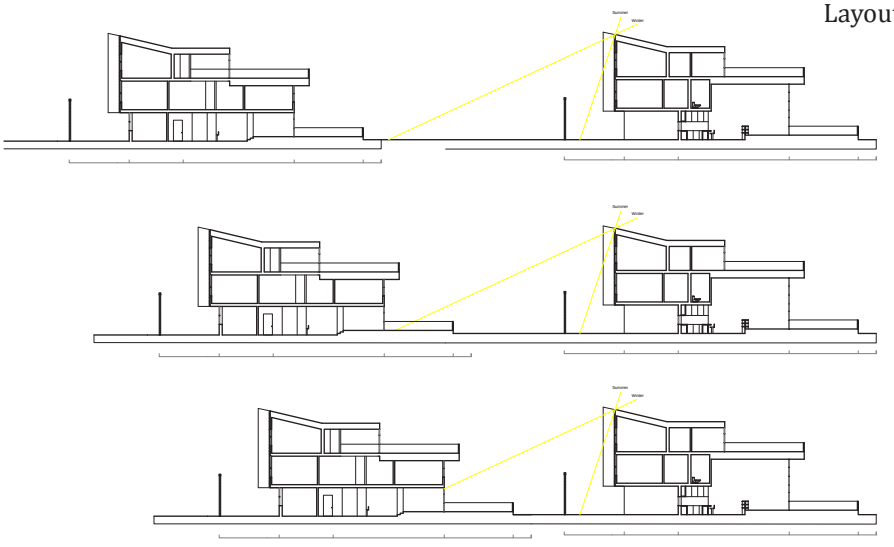
Sun and Unit Layout



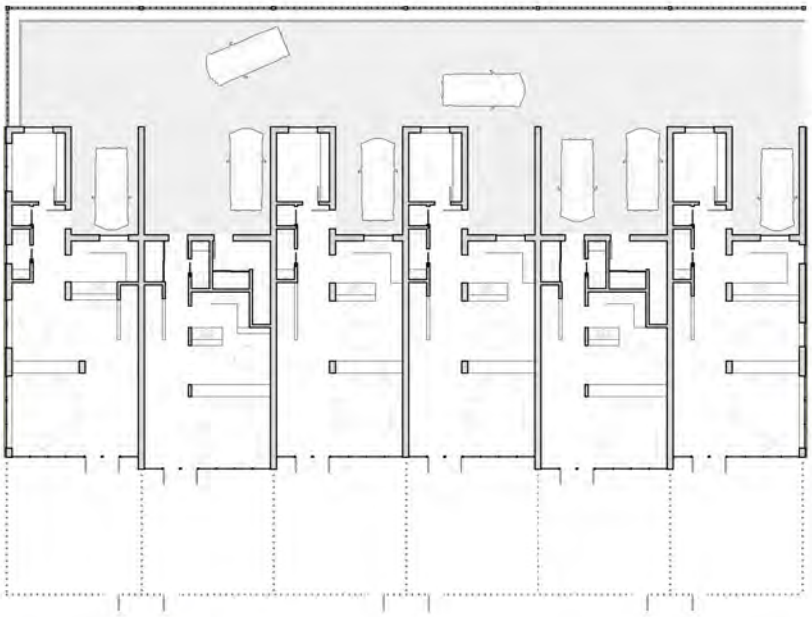
Structure and Main Entrance



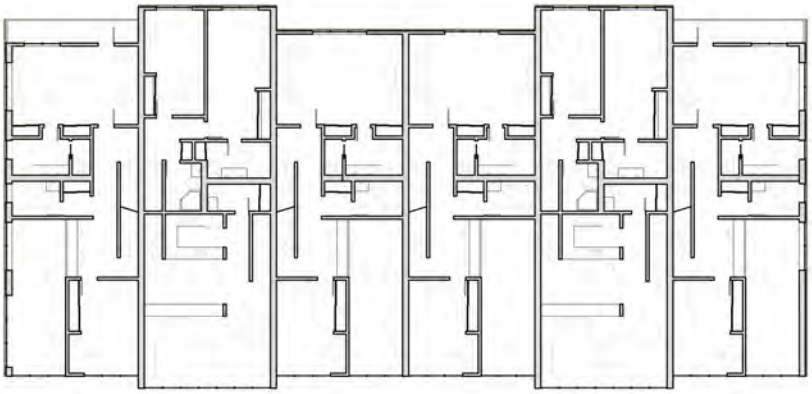
Layout of Units



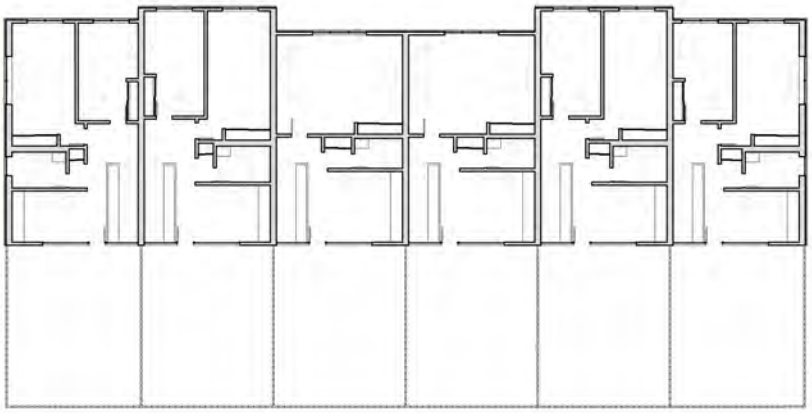
Sun Studies



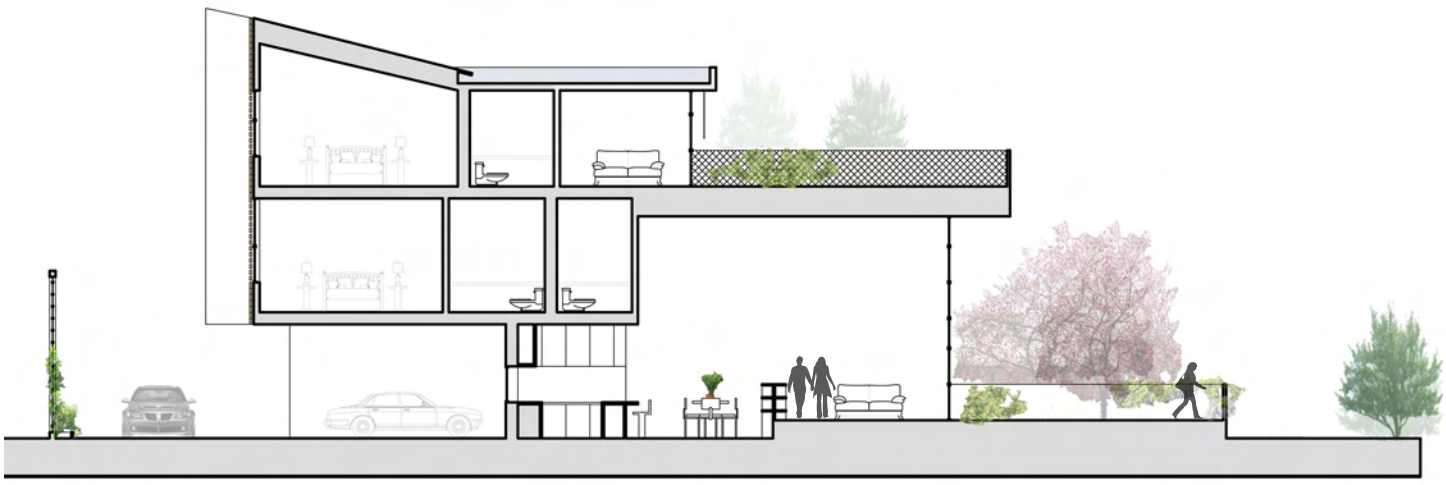
First Floor Plan
1/32” = 1’ - 0”



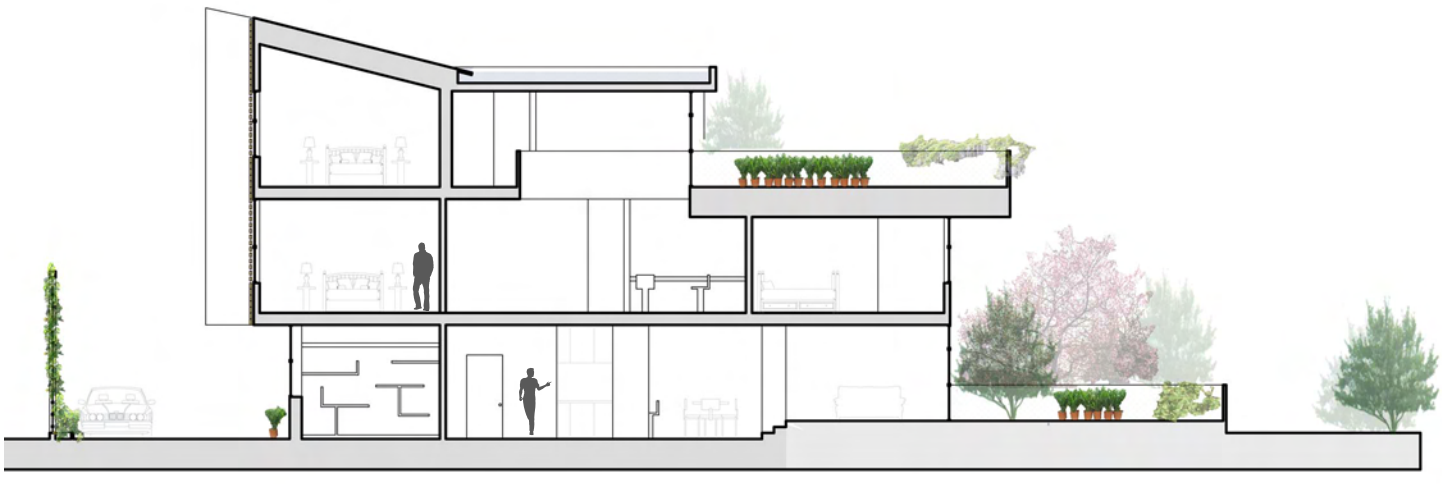
Second Floor Plan
1/32” = 1’ - 0”



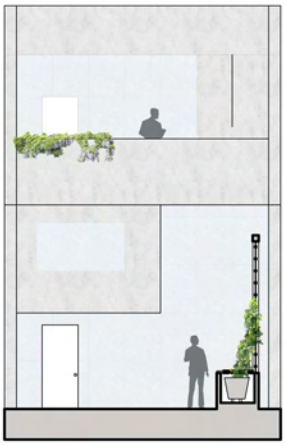
Third Floor Plan
1/32” = 1’ - 0”



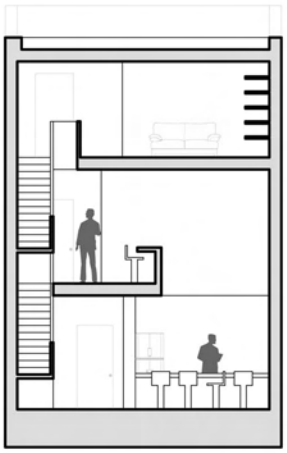
Section A
1/16” = 1’ - 0”



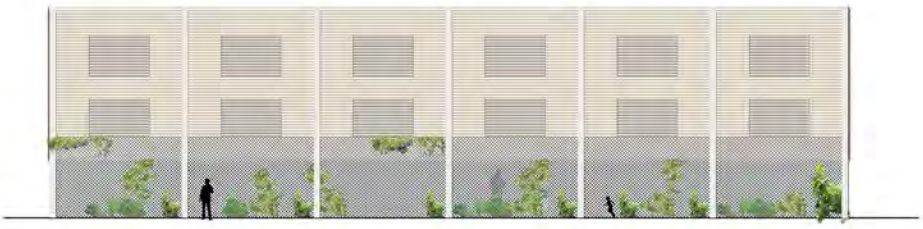
Section B
1/16” = 1’ - 0”



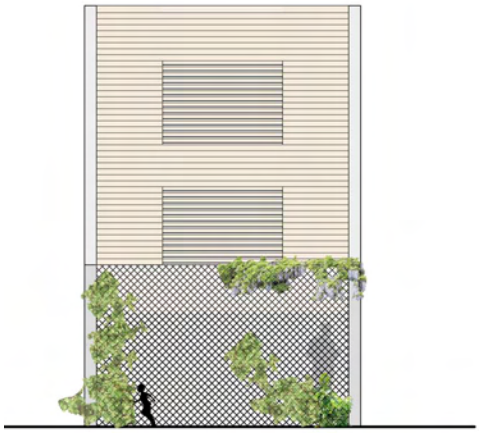
South Elevation
1/16” = 1’ - 0”



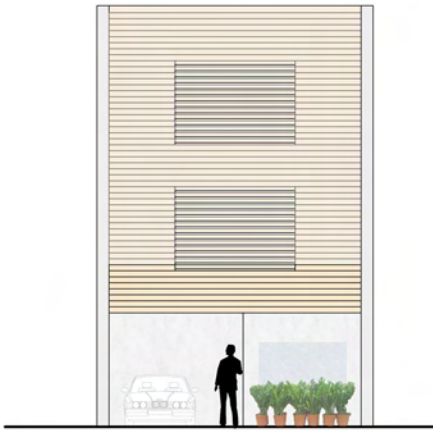
Section
1/16” = 1’ - 0”



Row House Elevation
1/32” = 1’ - 0”



North Elevation
1/16” = 1’ - 0”

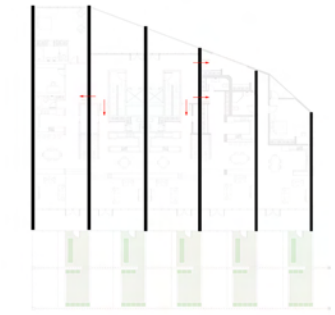


North Elevation
1/16” = 1’ - 0”

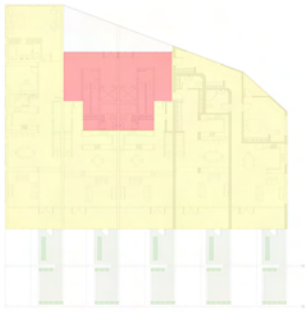
Tower Units

1	1 Bedrooom (red)	x 8 =	8 Units, 8 beds
2	Two Bedrooms (blue)	x 8 =	16 Units, 48 beds
2	Four Bedrooms (purple)	x 8 =	16 Units. 64 beds
Total:	40 Units	and	120 Bedrooms

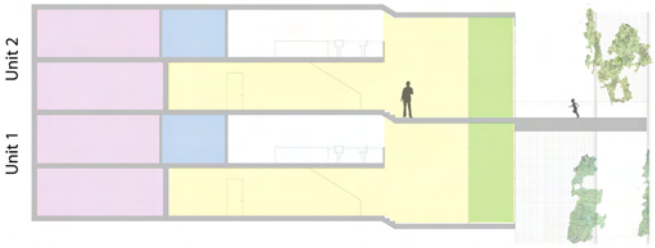
Tower Layout



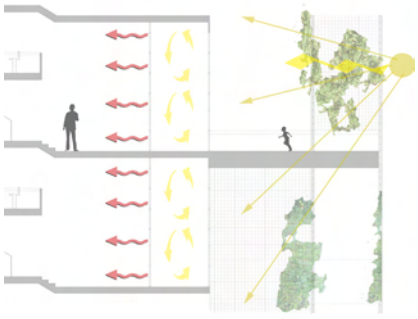
Structure and Main Entrances



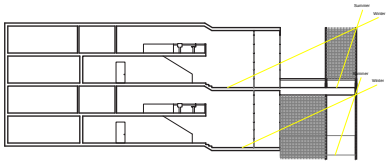
Program Organization



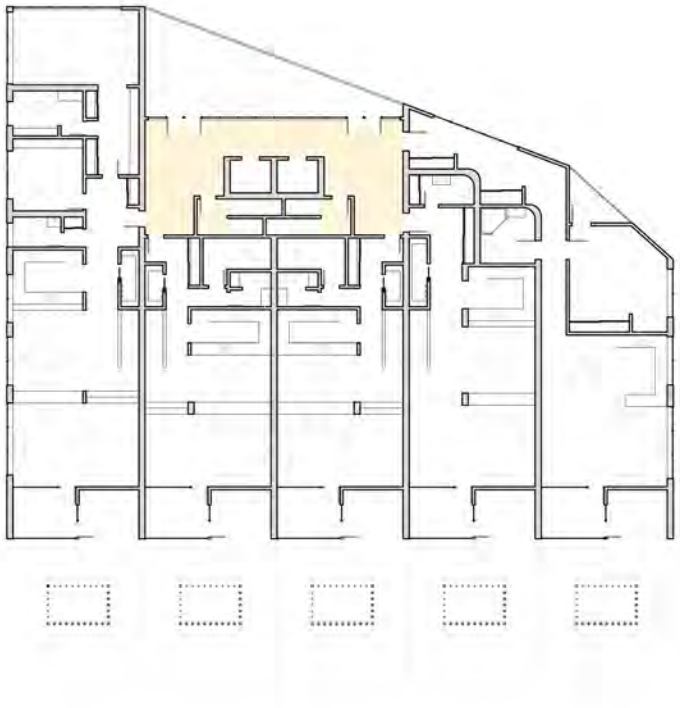
Program Organization (Section)



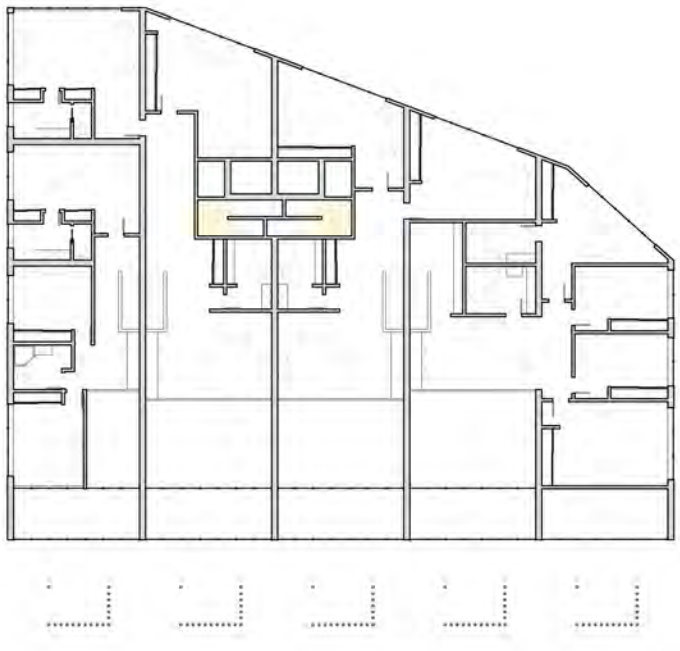
Sun and Screen Rotation Study



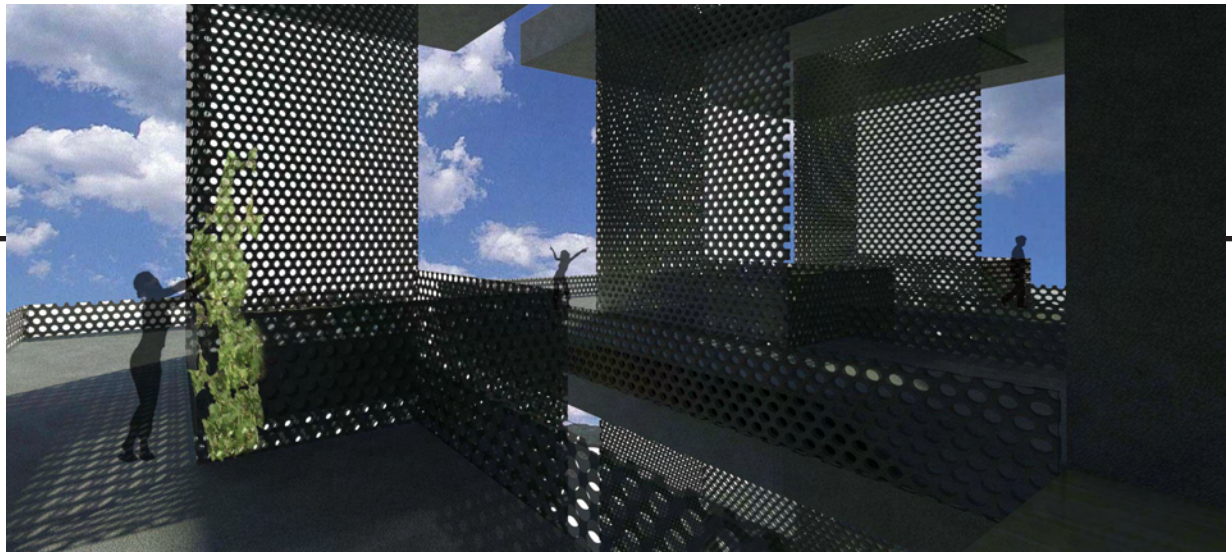
Summer and Winter Sun Studies

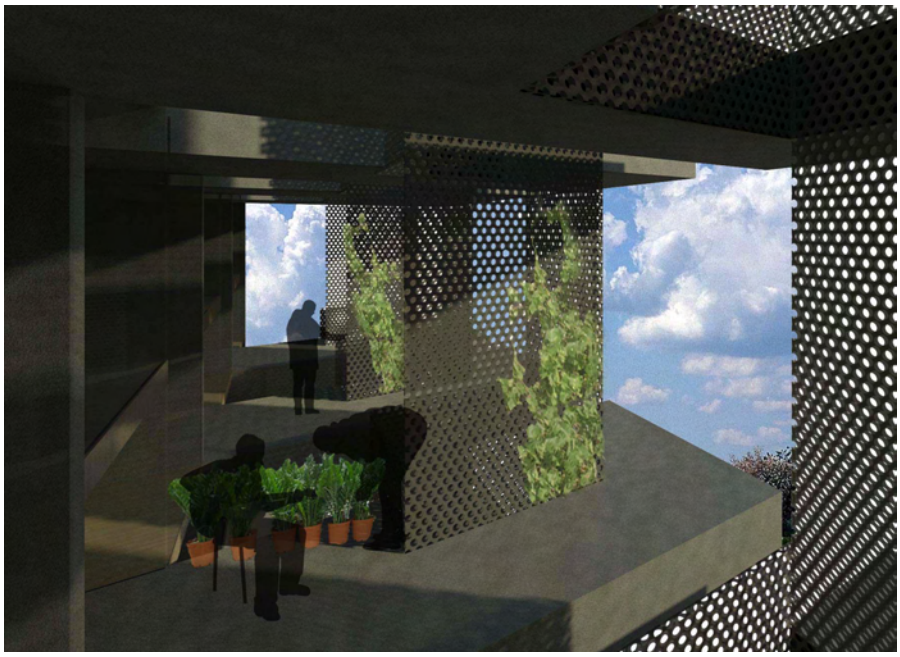


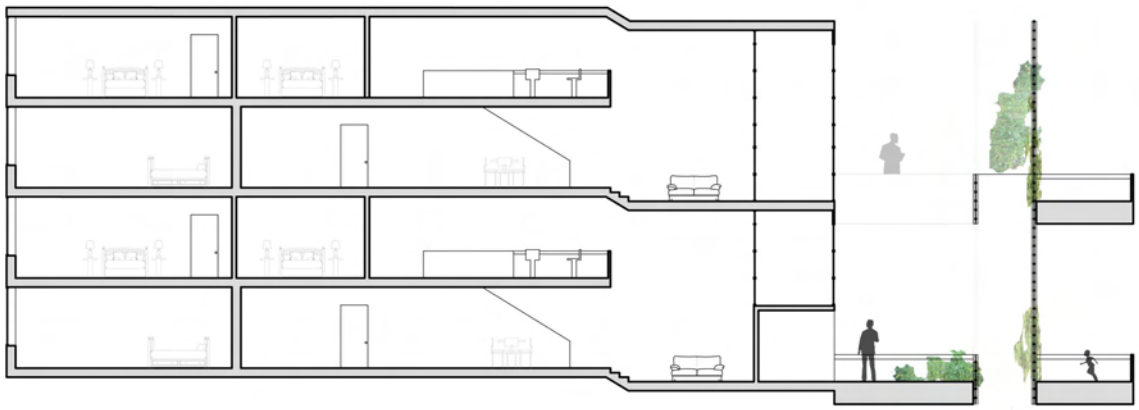
Lower Floor Plan
1/32” = 1’ - 0”



Upper Floor Plan
1/32” = 1’ - 0”

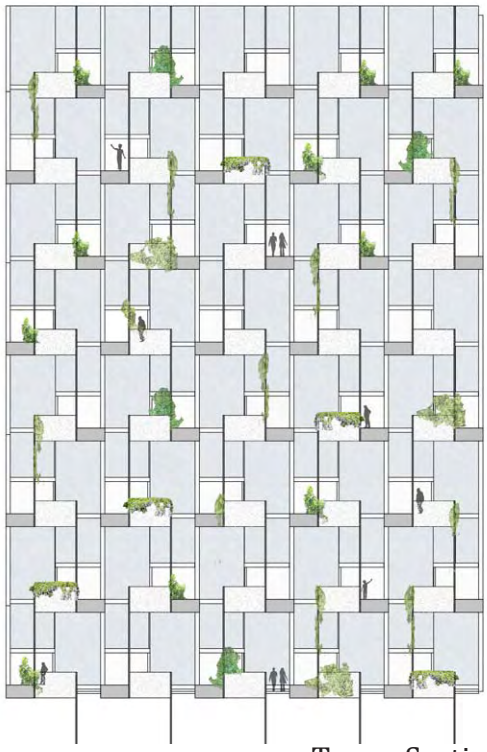






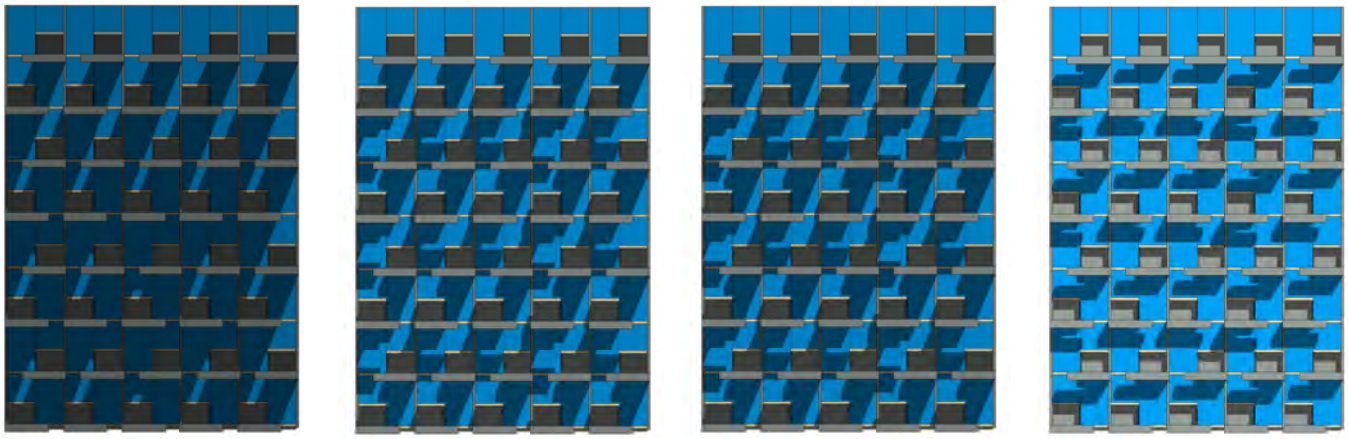
Tower Section

1/12” = 1’ - 0”

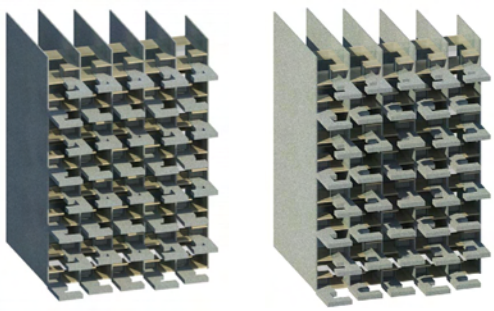


Tower Section

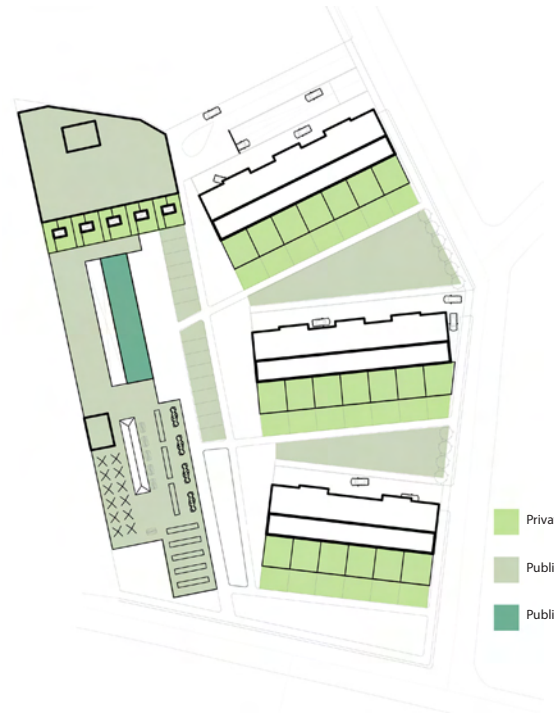
March 20 June 21 Sept. 22 Dec. 21



Sun Studies



Gardens



Private Resident Gardens

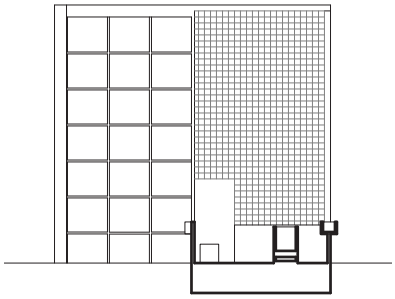
Public Communal Gardens

Public Hydroponic Gardens

Vegetables

Vegetable

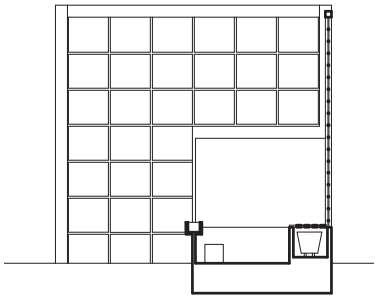
- Artichoke
- Asparagus
- Beans, dry
- Beans, shell
- Beans, snap
- Bush Beans
- Beets
- Broccoli
- Brussels Sprouts
- Cabbage
- Carrots
- Cauliflower
- Celery
- Chard
- Corn
- Cucumbers
- Eggplants
- Endive
- Garlic
- Kale
- Kohlrabi
- Leeks
- Lettuce, head
- Lettuce, leaf
- Muskmelons
- Onion sets
- Parsnips
- Peas
- Peppers
- Potatoes
- Pumpkins
- Radishes
- Salsify
- Spinich
- Squash, summer
- Squash, winter
- Swiss chard
- Tomatoes
- Turnips
- Watermelon
- Zucchini



Herbs

Herbs

- Arugula
- Basil
- Bay Leaf
- Burnet
- Cayenne Pepper
- Chives
- Cilantro
- Dill
- Fennel
- Ginger
- Lemon Balm
- Lovage
- Oregano
- Marjoram
- Pak Choi
- Parsley
- Peppermint
- Red Orach
- Rosemary
- Sage
- Sorrel
- Spearmint
- Tarragon
- Thyme



Edible Flowers

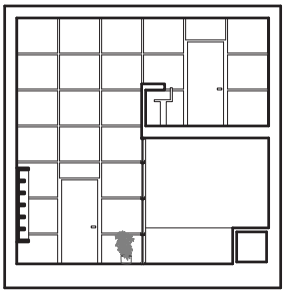
Edible Flowers

- Bachelor's Button
- Calendula
- Dianthus
- Marigold
- Nasturium
- Sunflower
- Violas

Fruits

Fruits

- Apple
- Apricot
- Blackberries
- Blueberries
- Cherry
- Grapes
- Kiwi
- Olive
- Peach
- Pear
- Plum
- Raspberries
- Strawberries



Nuts

Nuts

- Black Walnuts
- Butternut
- Chestnut
- Filbert
- Hazelnut
- Hickory
- Pecan
- Walnut

Medicinal Plants

Medicinal Plants

- Catmint
- Chamomile
- Echinacea
- Feverfew
- Horehound
- Hyssop
- Lavender
- Pennyroyal
- Rue
- Sweet Woodruff

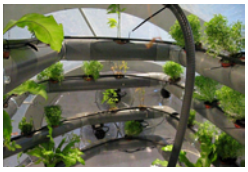
Container Gardening

Trellis / Vines

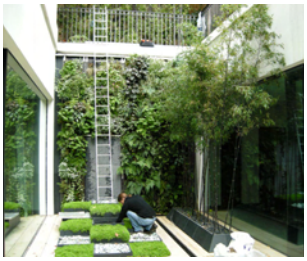
Wall Planter

Flower Bed

Hydroponics



Trees / Bushes



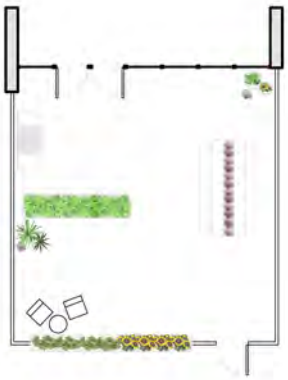
Window / Railing

Extreme Gardener

Casual Gardener

Athletic Gardener

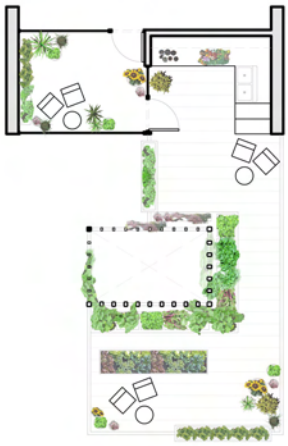
None Gardener



New Gardener

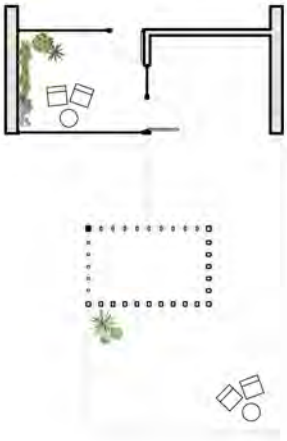
Social Gardener

Extreme Gardener



Casual Gardener

Athletic Gardener



None Gardener

New Gardener

Social Gardener

Appendix I: Literature Review Topic

Erica Wiggin
November 17, 2009
HOK Literature Review Topic

Does Population Size Affect the Ability to Achieve a Successful Sustainable Community?

Communities are generally defined as a living environment shared by a group of people that work together and share common interests. They can be found all over the world and have been found among all kinds of people and cultures. In the past, communities worked together, using their site and surroundings for the most beneficial use of their environment while creating a sustainable community. Though most of our ancestors lived like this naturally, communities now are very different and most are not sustainable at all. Kirkpatrick Sale has written extensively on this subject in her book The Human Scale. He states, "Human beings cannot adapt to their physical environment alone as individuals," he says, "Only by creating a 'human aggregate,' and thus practicing communal and cooperative efforts, are they able not only to survive but in many respects to prevail" (Sale, 180). We know that a community that can work together and contribute to a sustainable living environment is achievable, but what population allows that to happen? This literature review essay will explore the importance of a population size to achieve sustainability in successful communities.

Sustainable developments were first defined at a UN conference in 1987 and said that theses developments "meet present needs without compromising the ability of future generation to meet their needs" (WECD, 1987). In 1993 well established definitions of sustainability had been created but did not clarify the specific human and environmental parameters for modeling and measuring sustainable developments. At this time the site or environmental context became very important in most working definitions of sustainability and through multiple different sources came up with a composite definition of sustainable developments. "Sustainable developments are those which fulfill present and future needs while [only] using and not harming renewable resources and unique human-environmental systems of a site: [air], water, land, energy, and human ecology and/or those of other [off-site] sustainable systems (Rosenbaum 1993, Vieria 1993 and WECD 1987)

Lewis Mumford was horrified after WWII when all the superhighways, malls and tract homes were starting to be developed outside of the city. Mumford was not completely against people living outside of the city but it was the form that the suburbs took. Though Mumford was against the idea of urban sprawl, Jane Jacobs wrote a book called The Death and Life of Great American Cities which insulted urban planners that had designed American cities. Jacobs is part of a movement that attacks the destructive policies that create suburban sprawl known as New Urbanism. Though the attacks were not on the suburbia, but those that destroyed the "urban" qualities of the central city through segregation of use, slum clearance, "towers-in-a-park" and auto centered planning. Through this struggle of past developments we have to deal with the unsuccessful at times "edge city" which is the traditional distinction between the city and suburb. (Polycarpou, 2)

Throughout our history, many communities, towns and villages have been documented and analyzed. Some of the inhabitants created sustainable communities primarily for survival, but now it is something we have to commit to. Sale says that "…human success has depended precisely upon the ability of our species not only to live in small groups of twenty-five or so – for that is found in many other primates as well – but to create large communal institutions numbering into the several hundreds…"(Sale, 180). Looking at past history allows us to see how they survived naturally without the modern technologies that we have today.

Robert Adams of the University of Chicago and his colleagues have done substantial work in Mesopotamia and have evidence that the general size of the earliest village settlement was established in 5000 BC and "…varied from about fifty people to perhaps several thousand, but most often clustered somewhere around the 400-500 range" (Sale, 183). These settlements were regarded as communities then, but they still operated the same way, a sustainable community would operate today without the fancy technologies that we've become accustomed to.
An anthropological writer named John Pfeiffer has studied a large number of tribes including the "…Shoshoni Indians of the Great Plains, the Andaman Islanders in the Bay of Bengal, and other peoples as well as the Australian aborigines" (Sale, 182) which have a tendency to cluster at about 500 inhabitants. Pfeiffer says there is a basic limit to the number of people in a community that can know one another well enough to sustain a "tribal identity." Once many of these communities exceeded 500, a portion of the tribe would break off from the main group to form a new tribe of the same density.

Martin Wobst of the University of Massachusetts says that the sizes of prehistoric societies were determined by the optimum number of people for mate-selection. With the help of computer programming, he was able to calculate and determine that "…for a male to have an adequate pool of mates in his age group in any society in which incest taboo prevailed, he would need a total population of approximately 475 people" (Sale, 182). It appeared that relevant to prehistoric societies were the number of people who could fit into their meeting halls to determine the population size.

Lewis Mumford discusses issues related to hunting and gathering in his book The City in History but says that man needs a "…wide range and great freedom of movement" (Mumford, 10). He also predicts that if man was to survive on hunting and gathering techniques there should be less than ten people per square mile. This would allow for plenty of food for the man and his family to live while still allowing nature to replenish itself so that man could continue hunting on his territory. Mumford also talks about small villages and describes them to be in "…a small cluster of families, from half a dozen to threescore perhaps…"(Mumford, 18).

Charles Erasmus, an anthropology professor at the University of California, argues that most communities seem to average less than five hundred inhabitants. "He cities the upper limits of 600 for the Shakers, 500 for Amana groups, 300 for Oneida, 800 for Harmony, 500 for Zoar, and 150 for the Hutterites" (Sale, 184). These are examples of multiple different cultures from very different time periods and regions that all are sustainable with a similar population density.

Many villages have been studied more recently by famous scholars, but their examples are mostly from small villages in South America. Robert Carneiro works at the American Museum of Natural History, through his observations he has concluded that the "…villages among the Amazonian people he studied in Brazil tended to split up at populations between 100 and 200, and among Peruvian villages most split before they reached 300" (Sale, 183). Pierre Clasters is a French Scholar who has observed Tupi-Guarani villages of South American and estimated that they had a "…mean population of six hundred to a thousand persons…an actual census in the seventeenth century showed about 450 per village among the Tupis" (Sale, 183).

Sale herself concludes that the prehistoric humans lived in settlements that were not more than a thousand. Also, for a community's success, the maximum area of land should not exceed 23 acres, which would allow for a population density of about 15-40 people per acre and a total community population of between 345 and 920 people. She also predicts that the optimum neighborhood size is between 400 and 1,000 but the optimum number is 500. Then she compares it to a standard community which ranges from 5,000 to 10,000 people (Sale, 188).

Early cities would exceed capacity at about 5,000 inhabitants in a community. Clarence Perry was the grandfather of contemporary planning. His idea of a small scale community in the 1930's consisted of a neighborhood unit of about 3,000 to 9,000 inhabitants with an optimum size of 5,000. A population of 5,000 consists of 1,000 to 1,500 homes and about 15-20 per acre.

A Pattern Language by Christopher Alexander contains some interesting standards for a sustainable community. He averages the population of communities and small towns at about 5,000 – 10,000 people and the neighborhoods at about 500 – 1000 people. House clusters and working communities should be about 30 – 50 people in each cluster. Alexander continues to suggest that a community of 7,000 inhabitants would be ideal. He approximates that a town of 1,000 people should occupy 8 miles to be sustainable, and a neighborhood should consists of 400 to 500 inhabitants with no more than 300 yards of land. The average size of a cluster of homes should be between 4 and 8 but should never exceed 12. He states, "Individuals have no effective voice in any community of more than 5,000 to 10,000 persons" (Alexander, 71).

Ebenezer Howard is an English urban reformist that created his own perfect garden city through diagrams and notes. He argues that, in his perfect garden city, there would be 1000 acres of central urban core and 5000 acres of agriculture. He predicts that 32,000 inhabitants would be able to survive in this town with 5 times the amount of agriculture than in the city center where the inhabitants would live. He created these assumptions in the mid 1900's and really proves that we began designing our communities from learning from the past – as we still do today. (Sewell, 22)
Richard Register begins to discuss eco-cities that have already been developed and are in use today in his book Ecocities: Building Cities in Balance with Nature. Most of them are very successful, but how exactly have they created their success? Joan Bokaer created Eco Village Ithaca in New York and today is one of the most inspiring eco villages that exist. There were four main steps to create the village; it only has thirty-five families living in a neighborhood and only two neighborhoods in the community. This village is still extremely successful and is beginning to design and build a third neighborhood on the site (Register, 207).

An article that we found discussed a community that actually practices some of there own techniques and creates their own technology based on their natural resources and necessities. The community was located in Las Gaviotas, Columbia that for the last 40 years has been living on its own devices. Its 200 residents have no guns, no police force, no cars, no mayor, no church, no priest, no cell phones, no television, no Internet. No one who lives in Gaviotas has a job title. Gaviotas does have an array of innovations intended to make human life feasible in one of the most challenging ecosystems, from small inventions like a solar kettle for sterilizing water to large ones like a 19,800-acre reforestation project whose tropical pines produce resin for biofuel and a canopy under which native plant species flourish. Visitors who arrive at dawn on a Cessna plane leave before dusk. They see inventions like a water pump powered by a children's seesaw, a solar kitchen and the forest of tropical pine trees that stands in contrast to the otherwise barren plains. The village uses resin from the pines for biofuel in its tractors and motorbikes, and processes other resin for sale to use in products like varnishes and linseed oil (Romero, 2). This example of a sustainable development creates techniques and traditions which relate to that specific environment in Columbia to be able to survive. This is a truly sustainable development living like our ancestors had on secluded land with none of the necessities that we use today, and this is a current existing community.

Many sustainable communities, villages, development and cities exist throughout our world today. There are hundreds of examples that range in population size that all have similar intentions by using there own methods of survival in their environments. Eco-Village Ithaca (approx 150 people) is a well known community in upstate New York and is a remarkable example for all New England towns. The village is currently constructing their third neighborhood, each with about 30 units, within their village which is run and operated by most of the community members. There are larger communities such as the BedZed Project (approx 180,000 people) and MASDAR (approx 90,000 people), which are two examples that use sustainable techniques in a large city scale. These communities are all similar since they practice sustainable techniques and were built to house sustainable communities. They all have different population sizes which allow for different possibilities such as, face to face interactions or government run cities.

Through research, I have found that there is confusion throughout history about the difference between a community, a village and a neighborhood. There do seem to be some similarities between all the numbers and approximated population sizes in most of these cultures. Sale refers to the "magic number" in her book, The Human Scale; it seems to be at about 500 inhabitants. This density is the perfect number for a sustainable community since it permits everyone to have specific jobs while still allowing everyone to recognize and know each other. Sale concludes her chapter on communities by reviewing some scholars' thoughts on sustainable communities, which happen to agree with most of the other sources. Rene Dubos points out that during the past 10,000 years most people have lived in villages of about 500 inhabitants, and Hans Blumenfeld, an urban planner, says the population should be a size where everyone knows one another and this social network usually starts to fade out in villages with more than 500 to 600 inhabitants. A British science writer has estimated that the largest potentially successful group possible for human communities does not exceed 1,200 people. I would have to conclude that the evidence demonstrates there is a healthy population size for a sustainable community to be successful.

Works Cited

Alexander, Christopher et.al. A Pattern Language. Oxford Oxfordshire: Oxford University Press, 1977. Pp. 3-7, 18-25, 34-35, 70-71, 84-85, 198-202

Mumford, Lewis. The City in History. New York: Harcourt Brace & Co, 1989. Pp.8-20, 258-261, 486-501

Polycarpou, Lakis. Suburbs, cities and sustainability. < http://www.energybulletin.net/node/47461 >

Register, Richard. Ecocities: Building Cities in Balance with Nature. Berkeley: Berkeley Hills Books, 2001. Pp. 34-37,70-71, 116-121, 206-207

Romero, Simon. An Isolated Village Finds the Energy to Keep Going, October 15, 2009

Sale, Kirkpatrick. Human Scale. City: New Catalyst Books, 2007. pp.179 -209

Sewell, John. The Shape of the City. Toronto: University of Toronto Press, 1993.pp.22-23, 228-240

WECD, Roseenbaum and Vieria. < http://www.arch.wsu.edu/09%20publications/sustain/defnsust.htm >

Appendix II: Site Choices

Portland, Maine

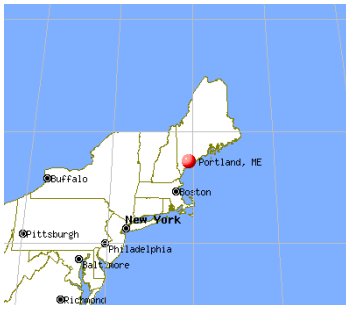
Portland, Maine is the capital and is the largest city in Maine. Located on the waterfront, it has been a popular trading port for hundreds of years. Recently, design projects have occurred through the town, consisting mostly of historic brick buildings. The city is much smaller than other New England cities but has much colder winters and much cleaner waters.

New Haven, Connecticut

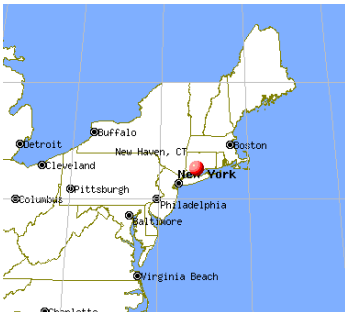
New Haven, Connecticut is located between Boston and New York near route 95, and it has a very lively atmosphere. The city is located on the water and has many historic homes and stories. Most of the buildings throughout the city are historic brick homes.; there are many parks and an abundance of trees.

Providence, Rhode Island

Providence, Rhode Island is the capital of Rhode Island and is also found on the water, at the end of the Narragansett Bay. The city has an incredible historic and iconic presence throughout its boroughs where redevelopment has been taking place for years. The highway renovation project has been underway for some time and allows for many additional redevelopment opportunities throughout the city. The historic downtown and the surrounding boroughs would profit with a better connection and relationship.



Portland



New Haven

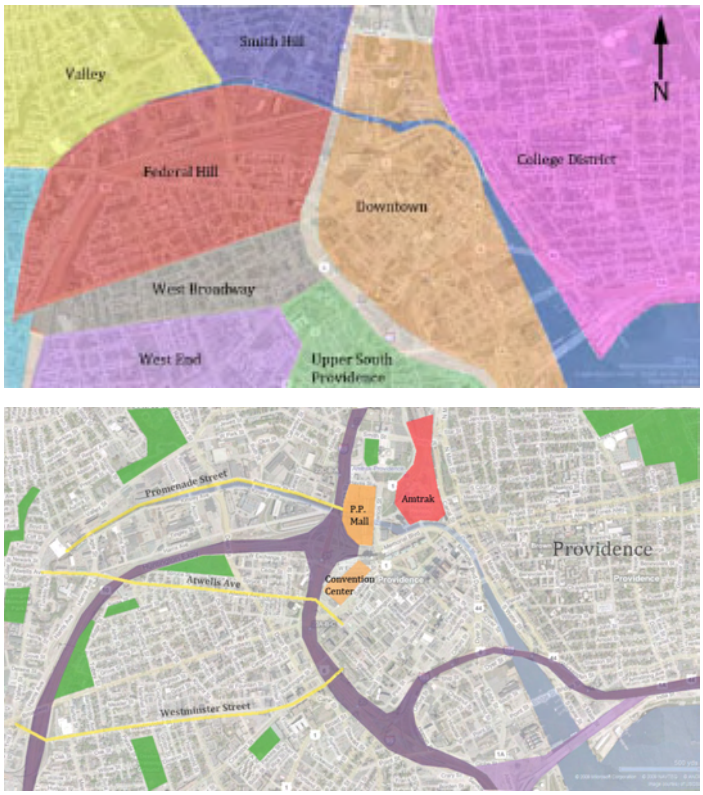
Providence

moneymag/18.html
localism.com/ri/providence
http://www.providenceri.com/
http://www.cityofnewhaven.com/
http://www.tourismjunction.com/north-america/united-states/portland-maine.html
http://money.cnn.com/galleries/2008/moneymag/0807/gallery.bplive_mostsingles.

Atwells Avenue

Atwells Avenue is a famous street known as “Little Italy” in the historic district of Federal Hill. The district is known for its residents of Italian heritage who still occupy most of the land consisting of high end restaurants, shops and plenty of night life. Atwells Avenue was named after Amos Maine Atwell, who was the first businessman to develop property on the western side of the city. During the 19th century, Federal Hill developed into a working class area partly because of the commercial shipping. A famous “archway” connects the Italian center of the past to the more modern downtown.

Atwell’s Avenue is a cultural centerpiece of Federal Hill. Many famous restaurants and a mixture of other urban businesses have existed on the street for centuries. There is a lot of activity on the street during the day and the night. Besides a variety of restaurants, there is a convenience store, local businesses, night clubs, tattoo parlors and housing. Recently many students and minorities have been moving onto Atwell’s Avenue but without changing the Italian culture of the street. Walkscore.com rated that section of Atwell’s Avenue at 83 out of 100 because of the extra five minutes it would take to walk to historic downtown. The street still has all the amenities necessary for a community to survive. (providenceplanning.org)



Positives

_ Existing Buildings and Parking Lots
_ Neighborhood and Businesses
_ Road cutting through site
_ Atwell's Ave seemed to be thriving already

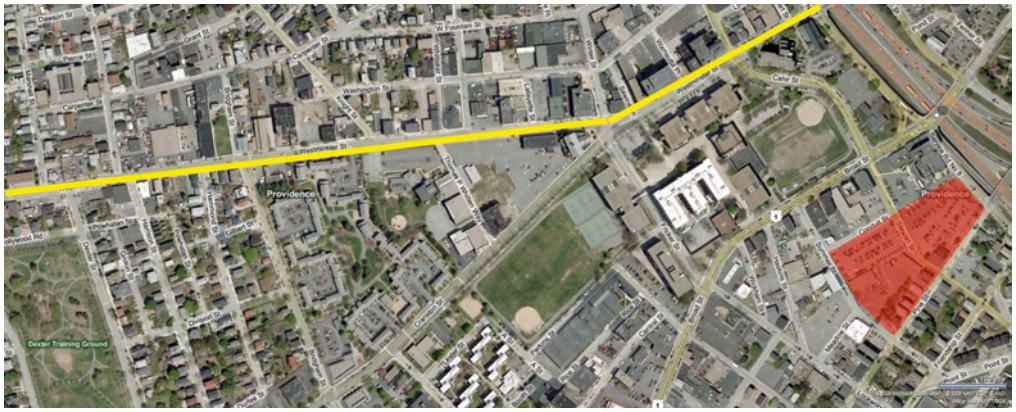
Negatives

_ Next to 95
_ Not directly on Main Street
_ Height Restrictions

Westminster Street

Westminster Street, on the border of Federal Hill and the West End district of Providence, is known as the West Broadway neighborhood. Before the 1800's, the land was mostly used for farming and, later, during the 1880's, the land was used for recreational activities and parks. After the world wars, wealthy Italo-Americans started moving into the neighborhood. In 1865, the first street car made its way from the city into the district using Westminster Street.

Westminster Street is part of the West Broadway neighborhood but is part of the larger district of Federal hill. It borders the city of Providence and it is well known since it continues into the historic downtown and continues west in the other direction. Currently the street is filled with offices, local stores, convenience stores, restaurants, shops, schools and housing. Historic churches are also found in the neighborhood which allows for community involvement. With a rating of 88 out of 100 on walkscore.com, this street provides many opportunities since it connects the city with neighborhood housing. The connections between the historic downtown and the west end of Westminster Street are weak and could use improvement. Many of the buildings that are abandoned and unoccupied are close to the highway, allowing for opportunities of development. (providenceplanning.org)



Positives

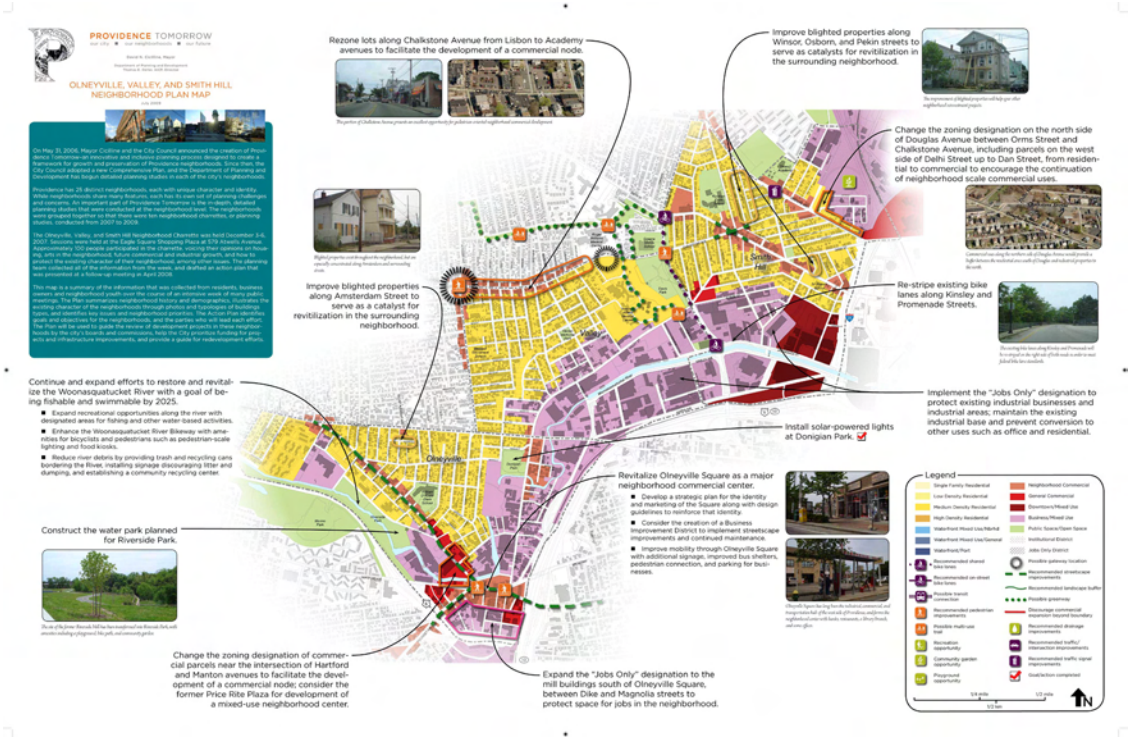
_ Existing Buildings and Parking Lots
_ Neighborhood and Businesses
_ Road cutting through site
_ Next to Central High school and Church

Negatives

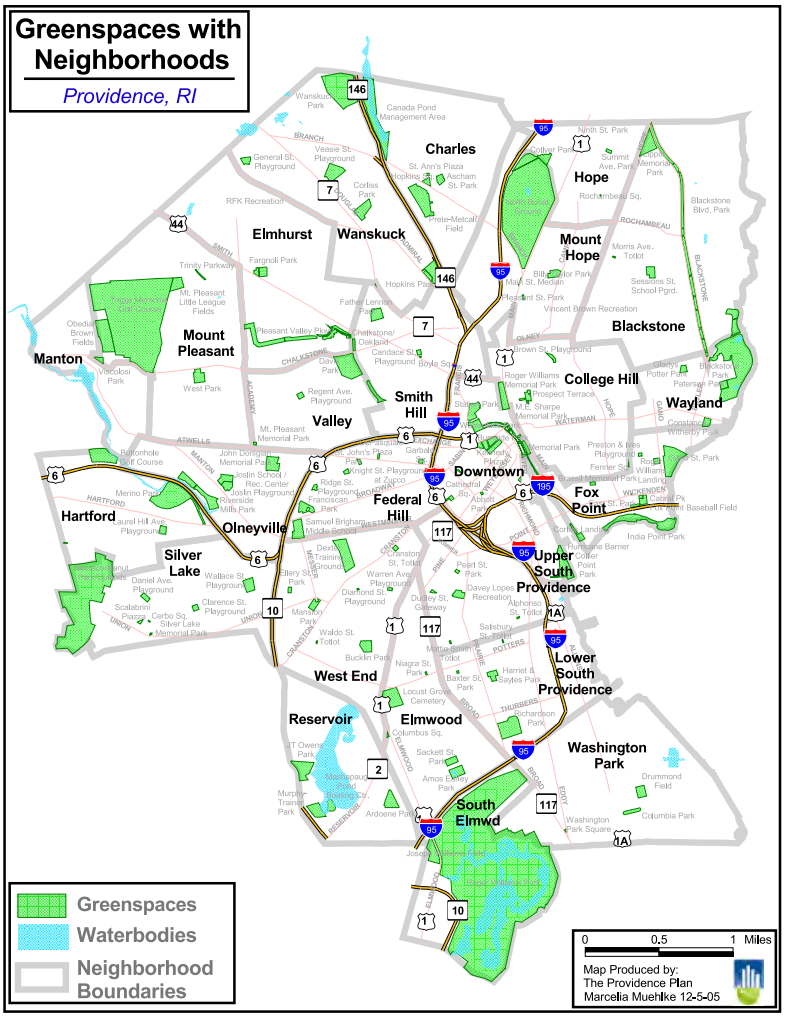
_ Next to 95
_ Not directly on Main Street
_ Height Restrictions
_ Westminster Street less personal, wider and less traffic

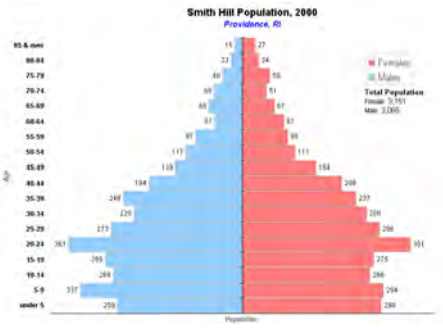
Appendix III: Smith Hill District

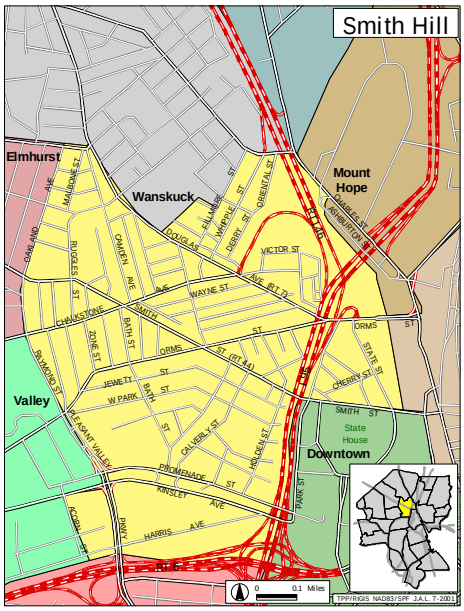
The Smith Hill district is currently part of the Providence Plan; the neighborhood has been redesigned but has not been started. The district is full of many fantastic opportunities that include all sorts of residential housing projects as well as commercial buildings. The Smith Hill Community Development Corporation (SHCDC) is dedicated to community building as well as to affordable housing. The district seems to be really trying to create a better environment for the people who do not seem to be interested in Promenade Street. The street is run down, though the newer housing complex might be part of their redevelopment process. The Smith Hill district has a large range of cultures and housing complexes throughout the area, ranging from factory mill buildings to single family neighborhoods. The connection to the downtown amenities makes the area convenient. Also the Providence Tomorrow Project has been doing redevelopment and master planning for similar areas throughout the western boroughs engaged in the city of Providence.



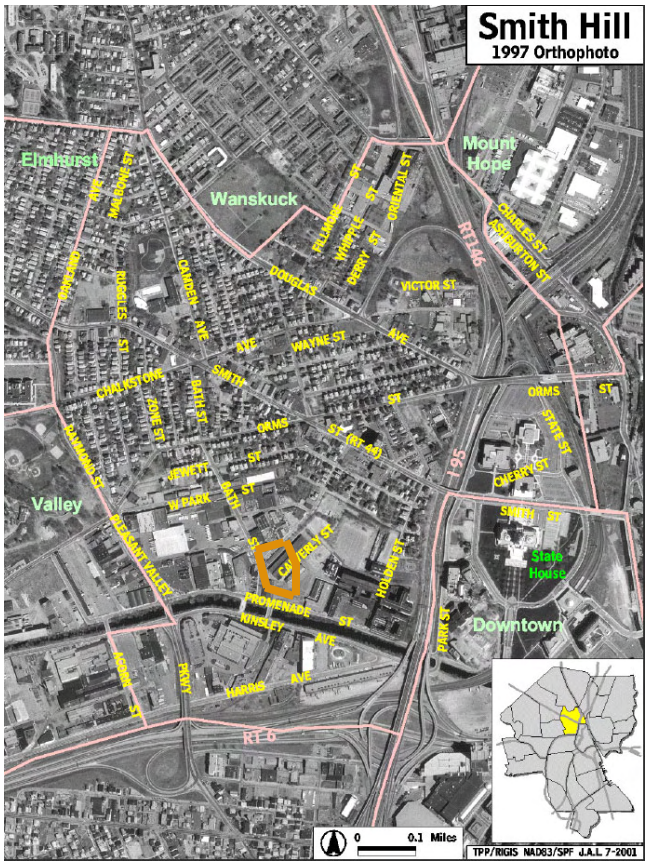
http://www.providence.edu/polisci/students/redevelopment/smith_hill.htm
http://www.gcpvd.org/more/providence-tomorrow/
http://www.providenceri.com/Neighborhoods/NeighborhoodMap_c.html

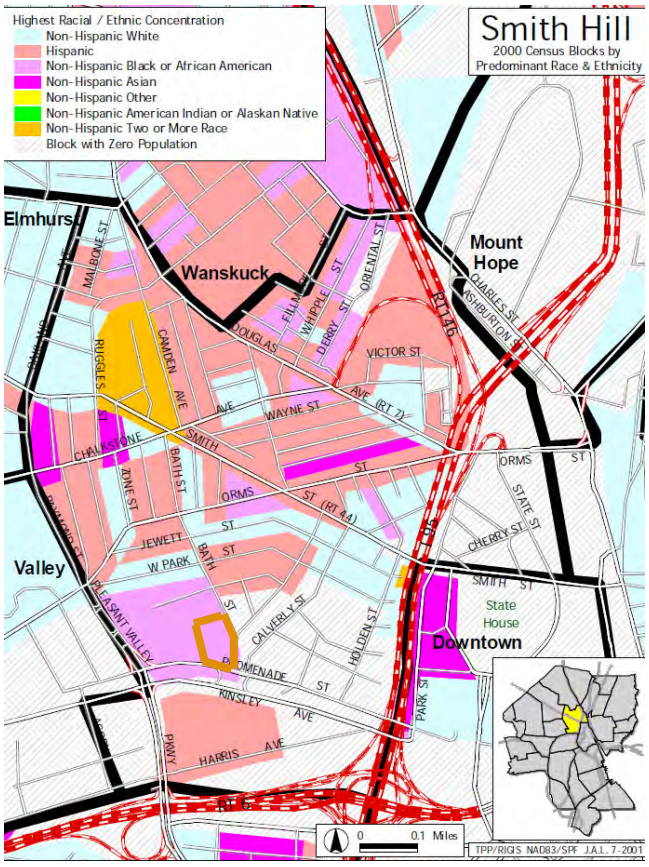


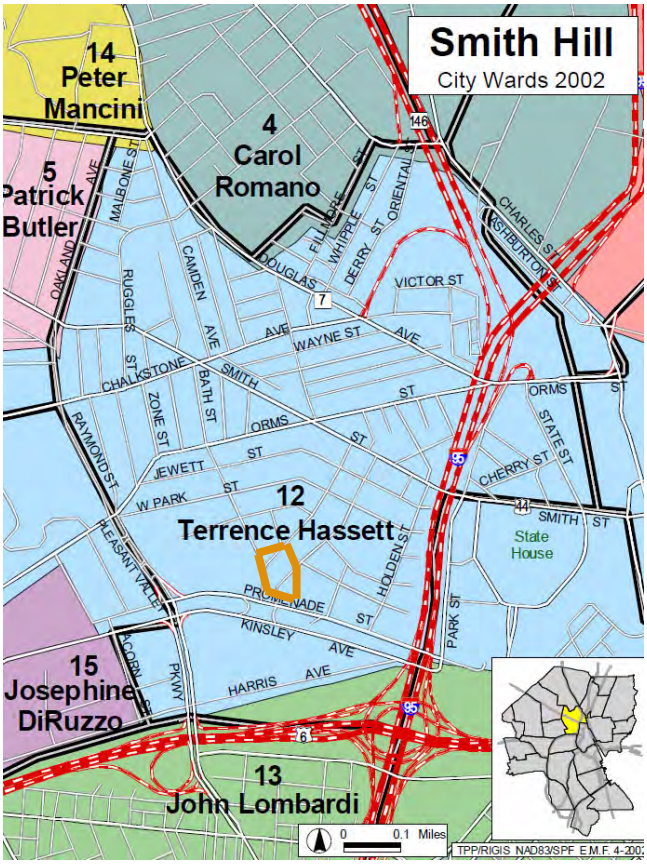


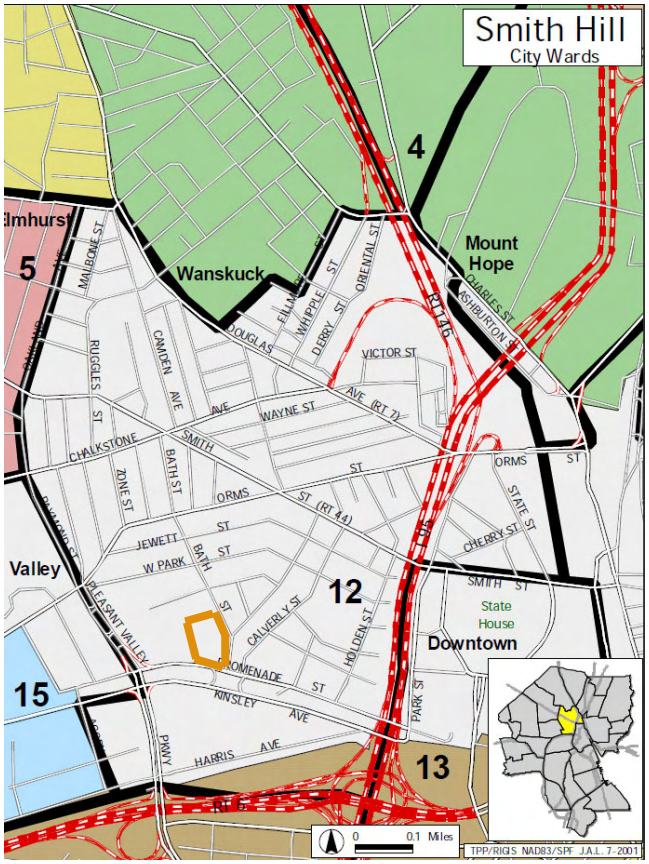


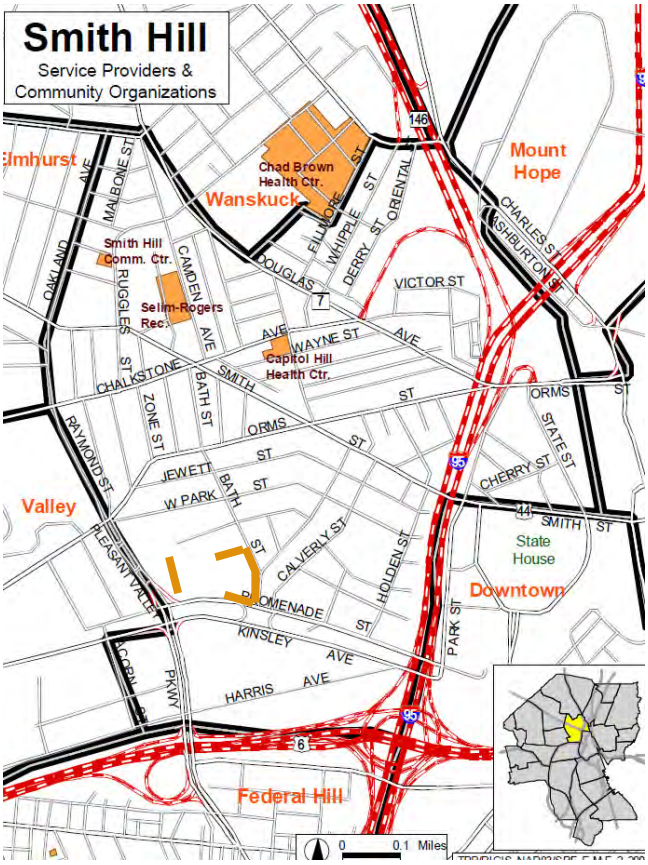
Smith Hill, Providence report (1980) – Prepared by the Rhode Island Historical Preservation & Heritage Commission

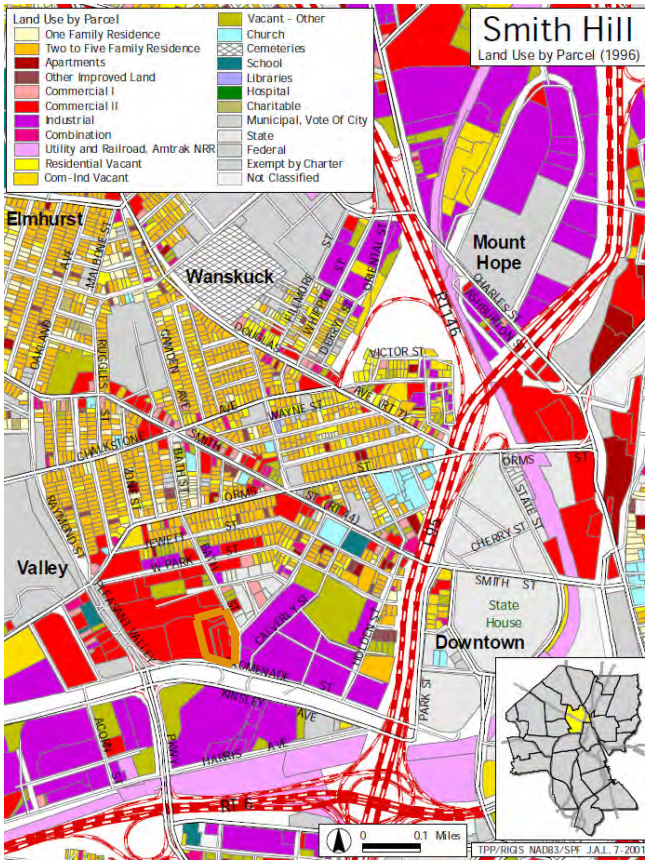

Smith Hill
1997 Orthophoto
Elmhurst
Wanskuck
Mount Hope
Valley
Downtown
State House
0 0.1 Miles
TPP/RIGIS NAD83/SPF J.A.L. 7-2001

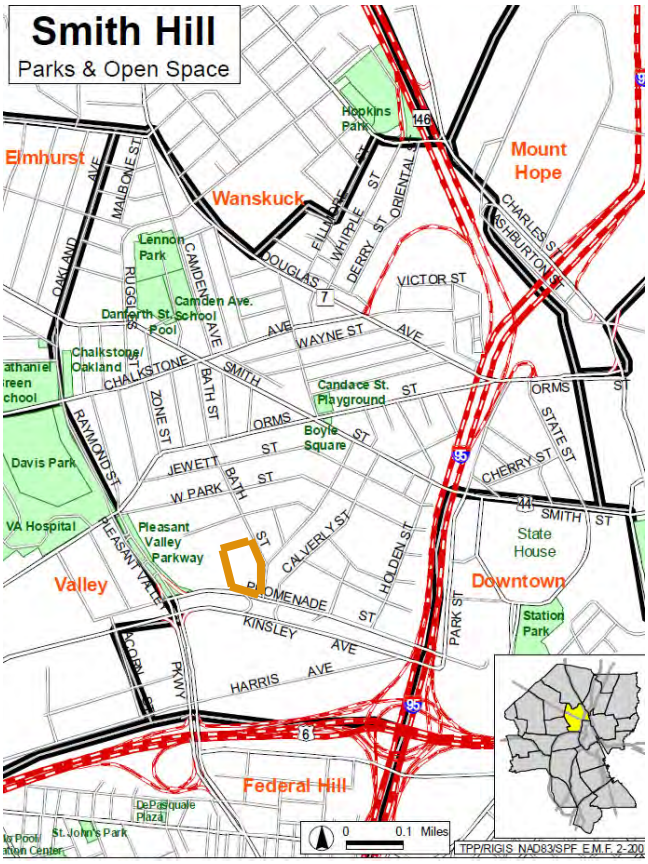

Highest Racial / Ethnic Concentration
Non-Hispanic White
Hispanic
Non-Hispanic Black or African American
Non-Hispanic Asian
Non-Hispanic Other
Non-Hispanic American Indian or Alaskan Native
Non-Hispanic Two or More Race
Block with Zero Population
Smith Hill
2000 Census Blocks by Predominant Race & Ethnicity
Elmhurst
Wanskuck
Mount Hope
Valley
Downtown
State House
0 0.1 Miles
TPP/RIGIS NAD83/SPF J.A.L. 7-2001

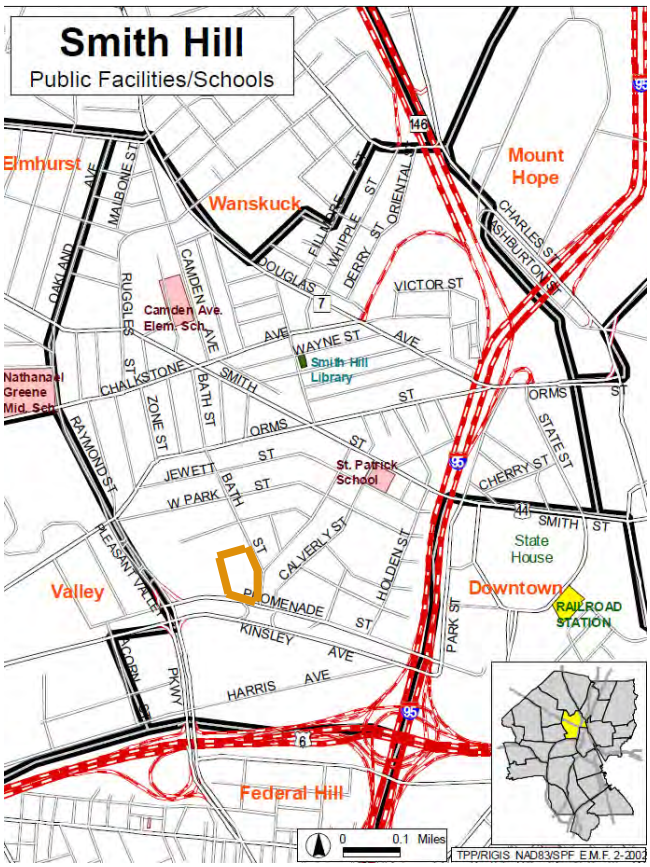

Smith Hill
City Wards 2002
14 Peter Mancini
5 Patrick Butler
4 Carol Romano
12 Terrence Hassett
15 Josephine DiRuzzo
13 John Lombardi
State House
0 0.1 Miles
TPP/RIGIS NAD83/SPF E.M.F. 4-200


Smith Hill
City Wards
4
5
12
15
13
Wanskuck
Mount Hope
Valley
Downtown
State House
0 0.1 Miles
TPP/RIGIS NAD83/SPF J.A.L. 7-2001


Smith Hill
Service Providers &
Community Organizations
Elmhurst
Wanskuck
Mount Hope
Valley
Federal Hill
Downtown
State House
Chad Brown Health Ctr.
Smith Hill Comm. Ctr.
Selim-Rogers Rec.
Capitol Hill Health Ctr.
MALBONE ST
OAKLAND AVE
RUGGLES ST
CAMDEN AVE
FILLMORE ST
WHIPPLE ST
DERRY ST
ORIENTAL ST
CHARLES ST
ASHBURTON DR
DOUGLAS AVE
VICTOR ST
WAYNE ST
CHALKSTONE AVE
SMITH ST
BATH ST
ZONE ST
ORMS ST
STATE ST
RAYMOND ST
JEWETT ST
W PARK ST
CHERRY ST
CALVERLY ST
HOLDEN ST
PLEASANT VALLEY PKWY
PROMENADE ST
KINSLEY AVE
HARRIS AVE
ACORN ST
PARK ST
146
95
44
6
7
0 0.1 Miles


Land Use by Parcel
One Family Residence
Two to Five Family Residence
Apartments
Other Improved Land
Commercial I
Commercial II
Industrial
Combination
Utility and Railroad, Amtrak NRR
Residential Vacant
Com-Ind Vacant
Vacant - Other
Church
Cemeteries
School
Libraries
Hospital
Charitable
Municipal, Vote Of City
State
Federal
Exempt by Charter
Not Classified
Smith Hill
Land Use by Parcel (1996)
Elmhurst
Wanskuck
Mount Hope
Valley
Downtown
State House
0 0.1 Miles
TPP/RIGIS NAD83/SPF J.A.L. 7-2001


Smith Hill
Parks & Open Space
Elmhurst
Wanskuck
Mount Hope
Valley
Federal Hill
Downtown
State House
Hopkins Park
Lennon Park
Camden Ave. School
Danforth St. Pool
Chalkstone/ Oakland
Candace St. Playground
Boyle Square
Davis Park
VA Hospital
Pleasant Valley Parkway
Station Park
DePasquale Plaza
St. John's Park
0 0.1 Miles
TPP/RIGIS NAD83/SPF E.M.F. 2-200


Smith Hill
Public Facilities/Schools
Elmhurst
Wanskuck
Mount Hope
Valley
Federal Hill
Downtown
State House
Camden Ave. Elem. Sch.
Nathanael Greene Mid. Sch.
Smith Hill Library
St. Patrick School
RAILROAD STATION
0 0.1 Miles
TPP/RIGIS NAD83/SPF E.M.F. 2-2002

Appendix IV: Codes and Ordinances

M-1: Industrial District

This zone is intended for general industrial uses that accommodate a variety of manufacturing, assembly, storage of durable goods and related activities provided that they do not pose toxic, explosive or environmental hazard in the City; and to support live-work spaces only in those existing underutilized industrial and/or commercial structures that are included in **Article V, Section 501, "Industrial and Commercial Individual Structure District."**

Multi - Family Dwelling

6. Must have a minimum of 5,000 square feet gross floor area required for new construction

The owner(s) of a building seeking a residential use in an M-1 Zoning District must sign and record a covenant and equitable servitude, on a form acceptable to the director, that acknowledges that the owner(s) and occupants of the building accept the industrial character of the neighborhood and agree that existing or permitted industrial uses do not constitute a nuisance or other inappropriate or unlawful use of land. Such covenant and equitable servitude must state that it is binding on the owner(s)' successors, heirs, and assigns, including any lessees of the residential use. **[Ord. 2009-39]**

Max Height – 75 feet or 6 stories (1. Max. Height cannot exceed maximum height of any R-Zone which is not overlaid by an Institution Floating Zone within 150 feet of the structure)
Min. Lot Area – None
Min. Lot Area Per Dwelling Unit – 1,200 sq. ft.
Min. Lot area per Rooming Unit – none
Minimum Front Yard - 0 feet (Where the property on the opposite side of the street is in an R-zone which is not overlaid by an Institutional Floating Zone, the front yard requirements of the R-zone shall apply.)
Minimum Side Yard – 0 feet Where the side yard of a lot abuts a lot in an R-zone which is not overlaid by anInstitutional Floating Zone, there shall be a side yard of not less than four feet for each story of 12 feet in height, but such yard shall not be less than six feet.
Minimum Rear Yard - 0 feet Where the rear yard of a lot abuts a lot in an R-zone which is not overlaid by anInstitutional Floating Zone, there shall be a rear yard of not less than 20 % of the lot depth, maximum required need not exceed 20 feet.
Maximum Lot Coverage - none

Parking

All zones other than D zones: A building or structure nonconforming by parking, may be changed to a different use, pursuant to all other provisions of this ordinance, provided that where such change in use increases the parking requirements in accordance with Article VII, additional parking spaces shall be supplied. The number of additional parking spaces supplied shall be the difference between the number of spaces required for the proposed use and the number of spaces required for the previous use. In the event that the new use requires less parking spaces than the previous use, no additional parking spaces need be supplied. However, none of the existing parking spaces shall be eliminated unless the number of spaces required by this ordinance for the new use are provided.

703.2 - Parking Requirements for All Other Zones: The following Table specifies the minimum number of off-street parking spaces required for each use. All parking facilities shall conform with the Rhode Island State Building Code with respect to number of spaces designated for handicapped persons. In determining parking requirements, all calculations shall be rounded up to the next whole number. **[Ord. 2009-39]**

704.l - Paving: Driveways and parking areas shall be paved with bituminous materials, concrete, brick, stone or equivalent surfacing, and shall be subject to the regulations of the Department of Public Works.

Regulations

406.1 - Screening of Trash Containers: All commercial, industrial and multifamily residential uses shall provide trash and / or garbage collection areas enclosed on at leastthree (3) sides by a solid wall, opaque fence or compact planting screen of at least five (5)feet in height if such area is not within an enclosed building or structure. Provisions foradequate vehicular access to and from such area(s) for collection of trash and/or garbageshall be required. Trash areas shall be limited to side or rear yards and must be located atleast five (5) feet from any lot line.

406.2 - Screening of Utilities: Utility substations, telephone exchange substations, television, radio or satellite dish and similar uses shall be enclosed on at least three sidesby a vegetative screen of hardy evergreens or shrubs at least three (3) feet high at time ofplanting and which shall be sufficient to provide a visual screen from adjacent R Zones.

Section 407 - Accessory Buildings and Uses in C, D, W, I and M Zones: Accessory buildings to any use which is limited to 2,500 sq. ft. of gross floor area shall only include a garage for the exclusive use of the patron or the storage of commercial vehicles. Accessory buildings to any other use shall be permitted to contain any accessory use which is customarily incidental and subordinate to the principal use, including a garage or storage building. All such buildings shall be on the same lot as the main use.

Section 418 - Corner Setback: In all zones except the D Zones, in the triangle formed by the street lines intersecting at an angle of less than one hundred thirty-five (135) degrees and a line joining points on such lines fifteen (15) feet distant from their point of intersection, no building or structures may be erected, no parking areas may be created and no vegetation may be maintained between heights of three and one-half (3 1/2) feet and ten (10) feet above the plane through their curb grades. Notwithstanding the provisions of this section, poles not exceeding eight (8) inches in outside diameter designed for the support of lights and signs, may be erected in this triangle.

420.3 - **Maximum Height in M, W-2, and W-3 Zones:** The Board, upon application for a variance, as provided in Section 902.3, may increase the maximum height allowed in this Providence Zoning Ordinance Article IV June 27, 1994 43 Ordinance by twenty (20) feet provided the use of the building is in conformance with Article III.

Section 425 – Trees and Landscaping: Open space within lots and outdoor parking areas shall be landscaped with trees, groundcover and shrubs to enhance the environmental and aesthetic quality of the City and to reduce the visual impact of parking areas from the public right-of-way and from adjoining properties. This Section regulates the quantity and location of landscaping on all lots in all Zoning Districts except for the D-1 Zoning District, which has separate landscaping provisions in Section 502.2. All development activity shall require either retention or installation of landscaping and trees, in accordance with the provisions of this Section. See Section 425.5 to determine if and when this Section applies.

425.1 – Quantity of Trees Required: Sufficient trees shall be retained or planted on a lot so that the square footage of vegetative canopy of such trees, when mature, equals a certain percentage of the square footage of the lot. This required percentage varies by Zoning District and is listed in Section 425.1 A). The total canopy coverage for a lot is the sum of the canopy, at maturity, of the individual trees located on the lot. The square footage of canopy cover varies according to tree species and is shown in the table in Section 425.1 B). Street trees located in the public right-of-way directly adjacent to the property line of the lot may be counted toward the canopy coverage for the lot. For developments that encompass more than one lot, the percentage shall be calculated for the total canopy for the total area of all of the lots. For developments that span multiple blocks, the percentage required shall be calculated separately for each contiguous area of the development within a block. Where existing conditions or other provisions of this Ordinance make it impracticable to meet the canopy coverage requirement on or adjacent to the site, the applicant shall plant sufficient trees to make up the shortfall in public rights-of-way within ¼ mile of the lot(s), with the location to be determined by the City Forester for the City of Providence.

A) Quantity of Trees by Canopy Coverage: The percentage of canopy coverage required for each zone is listed as follows:

1) R, PS, OS, CD and W-1 Zones: 30% of the square footage of the lot(s) or development.

2) D-1 Zone: See Section 502.2 for landscaping requirements.

3) All Other Zones: 15% of the square footage of the lot(s) or development.

4) Overlay and Floating Zones: The canopy coverage requirement of the base zoning district(s) shall apply.

Providence Zoning Ordinance Article IV June 27, 199457

B) Canopy Coverage by Tree Size: The City Forester shall maintain a list of trees

species and the expected size of the canopy for each species, at maturity, when

planted in Providence.

425.2 – Location of Trees and Landscaping for Parking Areas- Five or More Vehicles: The following requirements are for principal or accessory use parking areas for five or more vehicles, regardless of zone. Any trees planted pursuant to this Section shall be included in the quantity required for Section 425.1. A) Parking Areas Abutting Public Rights of Way: For parking areas that abut public rights of way, there shall be a planted strip, at least five feet wide, along the entire length of the border between the parking area and the right of way. At least one tree shall be planted in this strip for every 25 linear feet of frontage. These trees shall be large, medium or small trees, as classified in Section 425.1(B). The planted strip shall include grass, perennial plantings, or a combination of both, and may also include annual plantings. Where existing conditions or other provisions of this Ordinance make it impracticable to meet this planting strip standard, the City Forester may approve a modification to the width or location of the planted strip, or the spacing or number of trees in the strip, so long as there is no net loss of planted area or number of trees required by this paragraph. The City Forester, in consultation with the Director of the Department of Public Works, may also permit a portion of the landscape strip and plantings to be located in the public right-of-way. Providence Zoning Ordinance Article IV June 27, 199458 B) Internal Planting in Parking Areas: Where trees are planted in the interior of parking areas, they shall be located within islands that are curbed to prevent damage from automobiles. C) Parking Areas Abutting Lots in R Zones: Where a parking area in any zone adjoins a lot in an R Zone, the parking area shall be screened by a solid wall, a uniformly painted tight board fence, or a hedge of compact evergreens or other suitable plantings. Such screen shall be at least four feet in height, and shall be erected and maintained between the entire border of such parking area and the property in the R Zone.

425.3 - Land Adjacent to Water Bodies: There shall be a vegetated buffer, at least 25 feet wide, measured from the water's edge, or the inland edge of a coastal shoreline feature for tidal waterbodies (as defined by the Rhode Island Coastal Resources Management Program), adjacent to the entire length of any water body. This buffer shall include trees and plant material that will filter stormwater runoff and help to improve the quality of the water body. No parking or buildings are permitted within this buffer. However, paving for a walking path, bicycle path, or access to docks, piers, or beaches may be included within this buffer.

200.4 - Nonconforming By Dwelling Units: A building or structure containing more dwelling units than are permitted by the use regulations of this Ordinance shall be nonconforming by use. A building or structure containing a permitted number of dwelling units by the use regulations of this ordinance, but exceeding the lot are per dwelling unit regulations, shall be nonconforming by dimension.

201.3 - Maintenance and Repair: A building or structure containing a nonconforming use may be maintained and repaired except as otherwise provided in this Section.

205.1 - Addition Enlargement, Expansion and Intensification: A building or structure nonconforming by parking, may be added to, enlarged, expanded or intensified provided additional parking space is supplied to meet the requirements of Article VII for such addition, enlargement, expansion or intensification. The number of additional parking spaces supplied shall be the difference between the number of spaces required for the building or structure including such addition, enlargement, expansion or intensification, and the number of spaces required for the previous use of the building

Non-Residential Zones - Within any nonresidential zone, a nonconforming use may be changed to a permitted use, to a use listed under the same use code number in Appendix A, or may be changed to a different nonconforming use by Providence Zoning Ordinance Article II June 27, 1994 11 special use permit in accordance with Section 419.5. A nonconforming use, if changed to a permitted use, may not be changed back to a nonconforming use.

201.9 - Demolition:
A) A building or structure nonconforming by use, if voluntarily demolished, shall not be reconstructed, unless it conforms with the all the requirements of the Zone in which it is located.
B) If less than 50% of the Gross Floor Area (GFA) of a building or structure nonconforming by use is involuntarily demolished, destroyed, or damaged, it may be repaired to the same size and dimension as previously existed. [Ord. 2009-39]
C) If more than 50% of the Gross Floor Area (GFA) of a building or structure nonconforming by use is involuntarily demolished, destroyed, or damaged, the Board may grant a special use permit, in accordance with Section 902.4, to repair or rebuild the structure.

Section 404 - Accessory Solar Uses: An active or passive solar energy system which collectssolar energy and provides heating, cooling, light or electricity to a building or end use, ispermitted in all zones as an accessory structure. Such system may be located in any requiredside or rear yard, but shall not be located in any front yard nor exceed 8 feet in height. Solarsystems erected on a roof shall comply with the requirements of Section 412. In an HistoricDistrict, solar energy systems and solar collectors shall require the approval of the Historic District Commission in accordance with Article V.

Section 405 - Swimming Pool: A swimming pool shall not be allowed between the front of themain building and the street, and shall not be allowed in any required side yard.

414.3 - Corner Lots: On a corner lot in an R Zone, all yards fronting on intersecting streets shall meet the required front yard setbacks, including setbacks required by Section 414.4.

414.4 - Garages: The minimum distance between a lot line and a garage door must be at least eighteen (18) feet in order to allow for a parking space in front of the garage, without blocking the public right of way.

416.1 - Car Port: A car port may be permitted over a driveway in a side yard, provided such structure is attached to the main building, is not more than ten (10) feet in height and twenty (20) feet in length, does not extend to within 4 feet of a side lot line, and is entirely open on the remaining three sides, except for the necessary supporting columns and customary architectural features

412.1- Roof Structures Permitted Above Maximum Height:
A) The following roof structures are permitted above the maximum height as specified in this ordinance, provided that the total area of all such appurtenances is not more than one-third of the total roof area of the building: structures for the housing of elevators and elevator shafts; stairways; fire or parapet walls; skylights; towers; steeples; chimneys; and fully enclosed mechanical equipment rooms.
B) The following roof structures are permitted above the maximum height as specified in this ordinance: heating and air-conditioning equipment, ventilating fans, solar collectors, storage tanks for water, television, radio or satellite dish, antennae or masts, or similar equipment required to operate and maintain a Providence Zoning Ordinance Article IV June 27, 1994 39 building. No such roof structure shall exceed the maximum height for the zone in which it is located, except by the amount allowed herein: 1) Buildings from one (1) to six (6) stories - Ten (10) feet. 2) Buildings exceeding six (6) stories - Ten (10) feet plus one (1) foot per story above the sixth (6) story to a maximum total of twenty (20) feet.
C) If a roof structure exceeds one third of the total roof area, it shall be counted as a story and the building shall conform to the height restriction for the Zone in which it is located. [Ord. 1995-8]

412.3 - Roof Structure Setbacks and Screening: It is intended that permitted roof structures shall not be visible from street level, as provided below:
A) For all buildings three (3) stories or more in height, all roof structures shall be set back from the edge of the roof a minimum distance of one (1) foot for every two (2) feet by which the structures extend above the roof.
B) For all buildings less than three (3) stories in height and for any building where roof structures cannot meet the setback requirement of 412.3(A), there shall either be a parapet wall to screen the roof structure, or the roof structure shall be housed in solid building material which shall be architecturally integrated with the building and which shall be counted as one story. [Ord. 1995-8]

416.2 - Cornice, Sill or Chimney: A cornice, eaves, belt course, sill, canopy or other similar architectural feature (not including bay window or other vertical projection) may extend or project into a required side yard not more than 4 inches for each 16 inches of width of such side yard and may extend or project into a required front, side, or rear yard not more than 30 inches. Chimneys may project into a required front, side, or rear yard not more than 16 inches provided the width of such side yard is not reduced to less than 4 feet.

416.3 - Fire Escape: A fire escape may extend or project into any required front, side or rear yard not more than 4 feet.

416.4 - Open Stairway, Balcony or Porch: An open, unenclosed stairway, balcony, porch, deck, platform or landing place, which, except for the roof, does not extend above the level of the first floor of the building may extend or project into any required front yard not more than 6 feet, or into any required rear yard not more than 8 feet, and into any required side yard not more than 6 feet, but in no case closer than 4 feet to the side or rear lot line.

416.5 - Landscape Feature: A landscape feature, such as trees, shrubs, flowers or plants, shall be permitted in any required front, side or rear yard, and a patio or ground level deck, not exceeding 8 1/2 inches above the ground at any point, shall be permitted in any required side or rear yard.

421.1 Land Development Projects: All Land Development Projects, as defined by the criteria below, shall be reviewed by the Commission according to the Development Review Regulations adopted by the Commission pursuant to RIGL § 45-23. Unless specifically authorized by the Commission, no demolition, foundation, or building permits shall be issued, and no site work shall commence for a Land Development Project until the Commission has approved the Final Plan for such project.

A) Thresholds for Review as a Land Development Project: Any development that meets one or more of the following criteria shall be a Land Development Project.

1. Building Gross Floor Area: The gross floor area of all proposed new structures or additions to structures totals 10,000 sq. ft. or more.
2. New Dwelling or Rooming Units: Construction of new gross floor area that creates 10 or more dwelling or rooming units.
3. Parking Spaces: Any development that proposes to provide or is required to provide 50 or more new parking spaces.
4. Educational Institution: Any educational institution (primary through secondary schools) as defined by Use Code 21 that chooses to apply as a Land
Development Project, and that prepares and submits a Master Plan in accordance with Section 503.4 C) of this Ordinance.

B) Exemptions: The following types of development that meet the thresholds of
Section 421.1 A) are not Land Development Projects:

1. Any development in an Institutional Floating Zone, and subject to Section
503.
2. Any development subject to review by the Downcity Design Review Committee under Section 502, and/or the Capital Center Commission, under Section 504.

C) Adjustments of Dimensional Regulations: Pursuant to R.I.G.L. § 45-24-47 (c)(4), the Commission shall have the authority to make adjustments to applicable lot density and dimensional standards where open space is to be permanently set aside for public or common use, and/or where the physical characteristics, location, or size of the site require an adjustment, and/or where the location, size, and type of housing, commercial, industrial, or other use require an adjustment, and/or where housing for low and moderate income families is to be provided, or Providence Zoning Ordinance Article IV June 27, 1994 44

Section 429 – Regulations for Exterior Lighting: All exterior lighting shall be designed and installed in a manner that promotes security and safety, prevents light trespass and light pollution and reduces glare.

429.1 – For site lighting, all luminaires shall be downward facing and possess cut off light fixtures to prevent glare from reaching proximate properties and from causing glare in public rights of way.

429.2 – For lighting of buildings and structures, all luminaires shall be directed toward the building or structure and not toward the sky or proximate properties.

423.6 – Specific Standards

A) Construction Standards in Special Flood Hazard Areas (SFHA), Zones A, A1-30, AE.

1. Residential Construction: All new construction, substantial improvement to and repair of structures that have sustained substantial damage shall have the bottom of the lowest floor, including basement, elevated above the BFE (refer to the Rhode Island State Building Code for more specific elevation requirements).

2. Non-residential Construction: All new construction, substantial improvement to and repair of structures that have sustained substantial damage and which are commercial, industrial or otherwise non-residential shall meet the following standards:

a. The bottom of the lowest floor, including basement, shall be elevated above the BFE (refer to the Rhode Island State Building Code for more specific elevation requirements); or

b. In lieu of being elevated, non-residential structures may be dry floodproofed to one (1) foot above the BFE, provided that, together with all attendant utilities and sanitary facilities, the areas of the structure below the required elevation are watertight, with walls substantially impermeable to the passage of water, and provided that such structures are composed of structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy. A Rhode Island registered professional engineer or architect shall review and/or develop structural design specifications and plans for the construction, and shall certify that the design and methods of construction are in accordance with the acceptable standards of practice or meet the provisions of this section. Such certification shall be provided to the Director or designee.

3. Fully Enclosed Areas Below the BFE of Elevated Buildings: All new construction, substantial improvement to or repair of substantial damage to a residential or non-residential structure that includes fully enclosed areas formed by a foundation and other exterior walls below the BFE of an elevated building shall be designed to preclude finished living space and allow for the entry and exit of flood waters to automatically equalize hydrostatic flood forces on exterior walls (wet flood-proofing). Designs for complying with this requirement must

425.6 – Removal of Significant Trees: No Significant Tree, as defined in Section 1100.156 shall be removed without the prior permission of the City Forester for the City of Providence.

A) Application: Any person wishing to remove a Significant Tree shall file a request to do so with the City Forester.

B) Required Findings for Approval: In order to grant permission to remove a significant tree the City Forester must make one or more of the following findings within 30 days of receipt of the application:

1) The tree is in poor health or diseased with an expected life span less than two years.

2) The removal of the tree is unavoidable because the tree poses a danger to human safety, health and welfare.

D) Penalties – Any person who removes a significant tree without prior permission from the City Forester, or causes the death of a significant tree through negligent construction practices or other means as determined by the City Forester, shall be subject to a one-time fine equivalent to the value of the tree. The tree value shall be established using the Trunk Formula Method set forth in the latest edition of Guide for Plant Appraisal authored by the Council of Tree and Landscape, Appraisers. Fines shall be held by the Parks Department for forestry-related uses as determined by the City Forester.

Signs: Within all D, M and W-2 and W-3 zones, such signs shall not exceed a total area of thirty-two (32) square feet, and shall be removed within thirty (30) days of the real estate closing or lease transaction.

Appendix V: Precedents

Ancient City of Pompeii

Eco-Village Ithaca

Fellowship Community

Oregon Sustainability Center

Urban Farming Projects

Alberto Kalach

Living Machines

Colombian Community

Pile Up Building

Next 21 Housing

New York City's Museum of Modern Art

Villa van Vijven

Hydroponic Gardens

Nexus World Housing

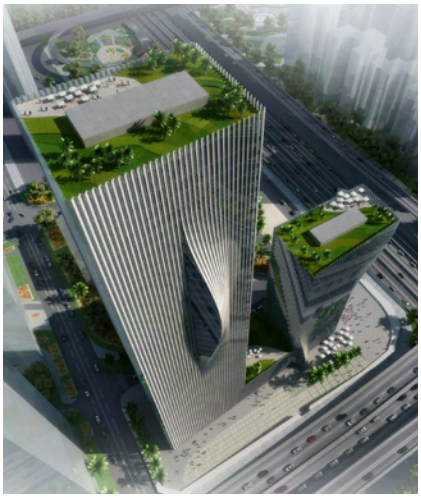
Green Roofs / Fresh Food / Market Places

Vikram Bhatt

Experimental Housing, 2004 - 2008

Tower / Balcony Inspirations

Interior House Inspirations



http://stephenbrammer.wordpress.com/tag/water/

Ancient City of Pompeii

Pompeii, 160 acre site, was said to have been first designed and created in the 8th Century B.C. and was destroyed by the eruption of a volcano in 79 A.D. Around 20,000 Romans were living in Pompeii when the Volcano erupted and were found after the city was "mummified" with ash, which was accidentally discovered in 1748. The streets, pedestrian walkways, water management systems, public parks, gardens and buildings are all aspects that were designed for the site by the community and users. The city is a great example of ancient City Planning and Land Use.

Location: Pompeii, Italy
Architect: Ancient Romans (Community members)
Size of Land: 160 acres (30 homes = 3 acres)
Population: 20,000 Romans (in 79 A.D)
Current: city preserved as a tourist site

Plan _ current city

Road _ path in city

Water _ drainage & storage

Paths _stepping stones

Sidewalk _either side of road

Aerial _ view of city

View _ courtyard, materials

Positive Elements

_ Integrated methods and materials
_ Waterway system
_ Paths, roads, walkways for public/private
_ Natural materials and resources
_ Natural Landscape, communal gardens
_ Work and live together

Integrated Design _ road, water & steps

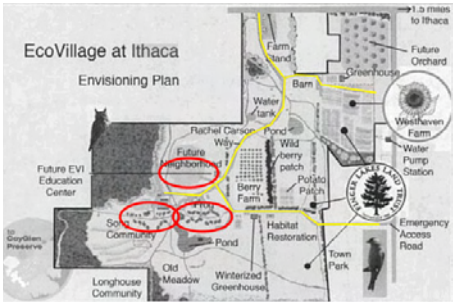
http://touritaly.org/pompeii/pompeii-main.htm & E.W. Photo's
http://dismanibus156.files.wordpress.com/2009/03/pompeii-aerial-view.jpg
http://www.emsei.psu.edu/~hoaglund/Pompeii/PompeiiMap.jpg

Eco-Village Itaca

Eco-Village Ithaca is an excellent example of a smaller successful eco-village that is still expanding today. The techniques and goals that guide the residents are an incredible inspiration to anyone who wants to live a sustainable life. The procedures and efforts they have made are very influential, especially in New England. Eco-Village Ithaca has 30 units within a neighborhood and is currently designing the third neighborhood to be built on the site. Creating an eco-village that complies with most of their standards would be remarkable even though it does require a lot of land. Sizable amounts of land are used to create all sustainable communities though builders do try to use the materials that are found on the individual sites. Although many sustainable communities exist, this precedent is close to home and is widely known for its success and the livable community that the residents have created.

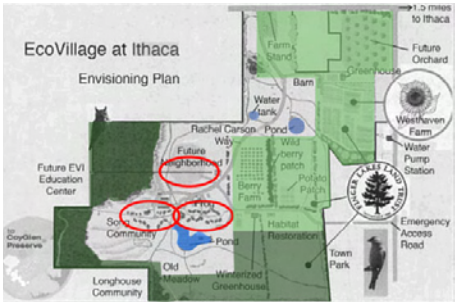
Location: Ithaca, New York
Architect: Michael McDonough Architects and Community
Size of Land: 176 Acres (80% green space)
Population: 100 people per neighborhood
Future: 5 neighborhoods and 500 people expected

Aerial _ neighborhoods



Neighborhoods _ streets in yellow

Green _ natural vs. garden space



Water _ ponds and storage tanks

Program / Housing

_ Common House
_ Pond and Playgrounds
_ Gardens and Compost Collection
_ One bedroom (922 sf)
_ Three bedroom (1350 sf)
_ Four bedroom (1642 sf)

Construction Techniques

_ Newspaper Insulation
_ Straw Bale Timber Framing
_ Passive Solar Design
_ Hot Water System (8 units share)
_ Common Electricity

Organic Farming

_ Communal fenced in Gardens
_ CSA Vegetable Farm
_ CSA/U-Pick Berry Farm
_ Root Cellar
_ Lots of Natural Areas with Animals

www.converge.org.nz/evcnz/
ecovillagevolution.tumblr.com/
www.pct.edu/.../09spring/aDegreeOfGreen.htm
www.permaculture.co.uk
http://ecovillageithaca.org/evi/
http://cornellsun.com/node/39086
http://fuse.ithaca.edu/7253/

Fellowship Community

A fellowship community, like the society formed in Chestnut Ridge, New York, is made up of a group of people that work and learn together; caring for the earth is the central motif of the community life. Most of these communities are organized around religion, and they seek harmony between the man-made and the natural realms. Their mission is to care for people all ages, especially those who are ill, through natural medicines and resources. Exploring the unfolding realities of life allows the residents to experience and learn about real issues while living naturally and sustainably. Each of the members participates in some of the nine work activities or services that contribute to the well-being of the community.

Location: Chestnut Ridge, New York
Spiritual and Scientific Leader: Rudolf Steiner
Size of Land: 120 acres (40 acres for Farm Land)
Population: 140 souls and 60 volunteers
Future: Continue life with all ages (focused on Life and Death)

Aerial _ farm land

THE NINE WORK ACTIVITIES

Human Care

Predominantly older person but all ages are looked after.

Printshop

Where usual printing jobs get done, and books are printed.

Pottery

Where all ages are often busy and productive.

Metal and Wood Shops

For repairs and production of articles for sale.

Hand and Hoe

Outlet for social interchange and the scale of community products.

Weavery

Where often the very old get a new start in activities.

Garden and Field

Work with farming and general environmental care.

Medical Practice

With a predominance of patients from outside the community.

http://www.fellowshipcommunity.org/old/home.htm
http://www.pfaf.org/leaflets/med_uses.php
http://odyb.net/discoveries/27-medicinal-plants-worth-your-garden-space/

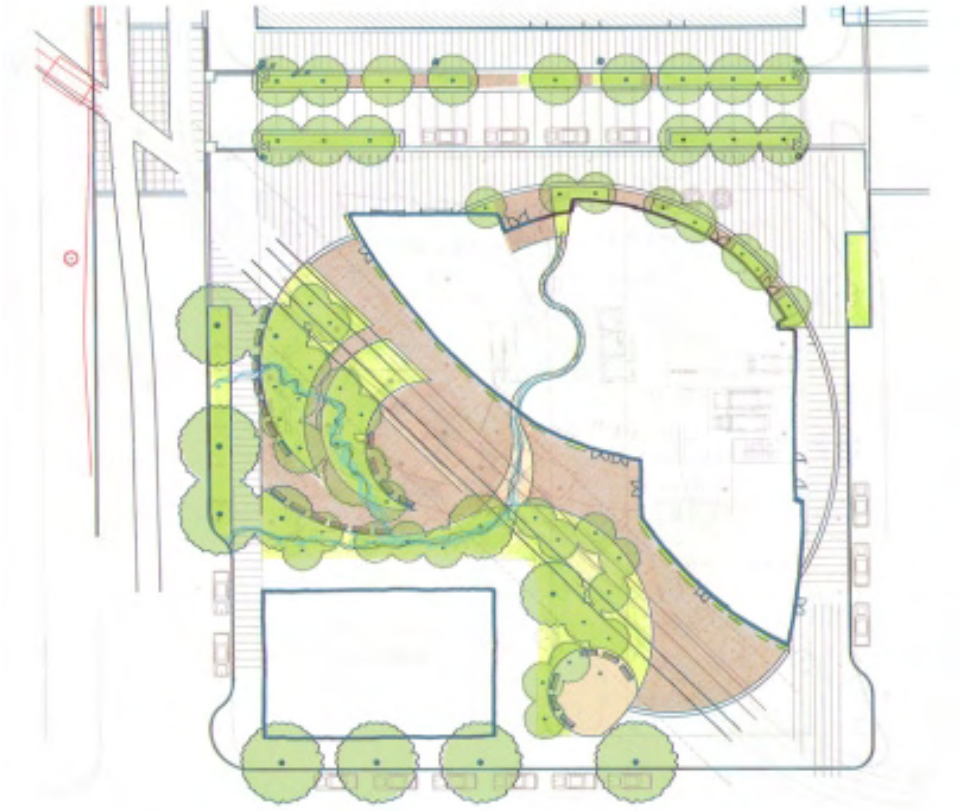
Candelshop

Where rainbow colored and specialty candles are made.

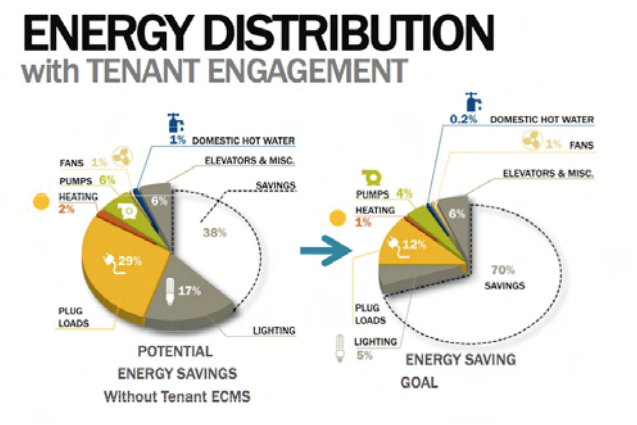
Oregon Sustainability Center

The Oregon Sustainability Center is a project that is being proposed for Portland, Oregon. The "Living Building" will be created as a work place primarily for sustainable business practices. The building will produce and use all the power and energy that will be needed on site. All the water and waste will also be managed on site before being recycled to the city. The design features that have been investigated are intended specifically for human enjoyment. This project is an excellent example of a completely sustainable living building that is provided primarily for private entrepreneurs. If this building is built in Portland, it will allow people to learn more and provide sustainable businesses with a place to work and sell their products.

Location: Portland, Oregon
Architect: SERA Architects and GBD Architects
Size of Project: 225,000 s.f. - 13 story high-rise
Population: Office Building - 100% of energy needs supplied on-site
Future: Construction begins in 2010, hopefully

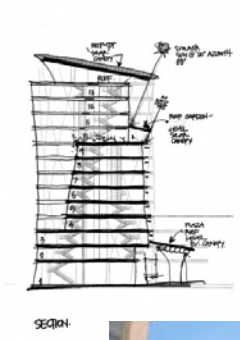


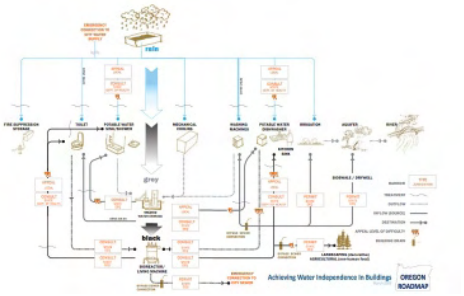
Site Plan _ farm land

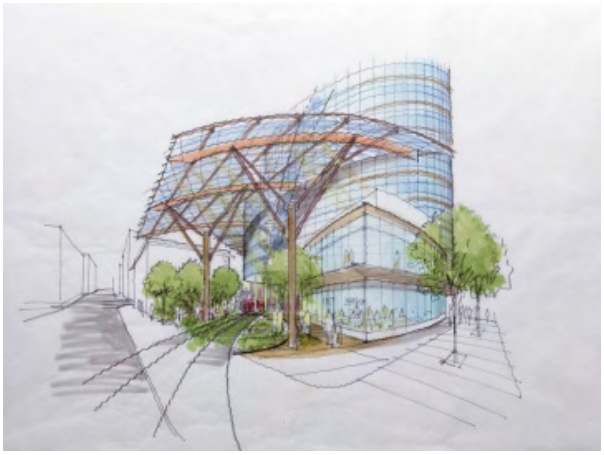


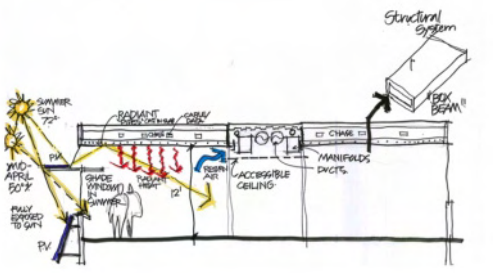
Positive Elements

- _ Living Machine
- _ 100% on-site energy
- _ All sustainable businesses
- _ Place to teach and learn
- _ Collaboration
- _ Experimental Goals
- _ Cost efficient for tenants

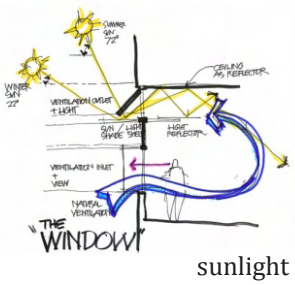




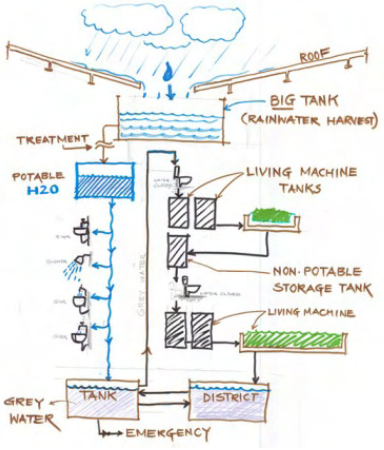




heating and day light



sunlight



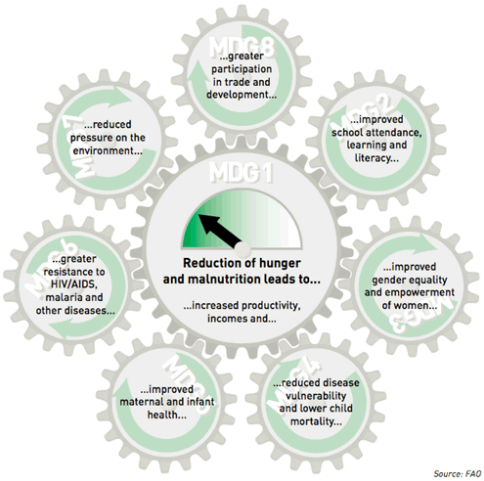
water management

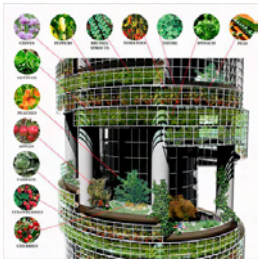
http://oregonsustainabilitycenter.wordpress.com/
http://ilbi.org/about/news/pdfs/09-0619%20AIArchitect%20Oregon%20Sustainability%20Center%20Will%20Be%20a%20Locally%20Grown%20Original.pdf
http://oregonsustainabilitycenter.wordpress.com/2009/05/08/solving-the-programming-puzzle/

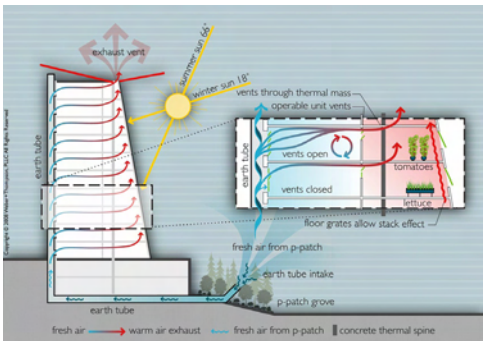
Urban Farming Projects

A Columbia University professor, Dickson Despommierm, is dedicated to reducing global warming through vertical farming in skyscrapers in urban areas. This idea has been implemented in many of his studio projects, which continue to investigate and experiment with city skyscrapers dedicated to farming and crops. There are many examples of his work online that detail the way these projects could work to create a healthy sustainable way of producing organic food in the city. Many of the projects do not include housing but are concentrated only on farming which, in some ways, results in a less sustainable project.

Location: Urban Studio Design Projects
Architect: Professor Dickson Despommierm and Students
Size of Project: Range of Skyscrappes
Population: Farming and Gardens
Future: Not yet constructed, mostly experimental projects

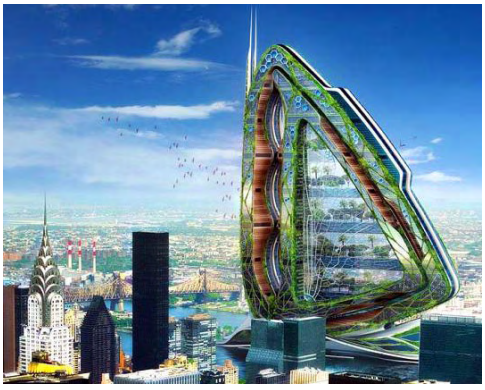






Positive Elements

_ 1 indoor acre = 30 outdoor
_ No weather issues
_ Organic not artificial
_ Reduces Fossil Fuels
_ New employment in cities
_ Water and Energy on-site
_ Experimental



http://www.inhabitat.com/2009/10/13/smarter-cities-vertical-farming-could-ease-worlds-agricultural-woes/
http://www.verticalfarm.com/
http://vtdesigninstitute.blogspot.com/2009/05/vertical-farming-for-burlington.html
http://en.wikipedia.org/wiki/Vertical_farming

Alberto Kalach

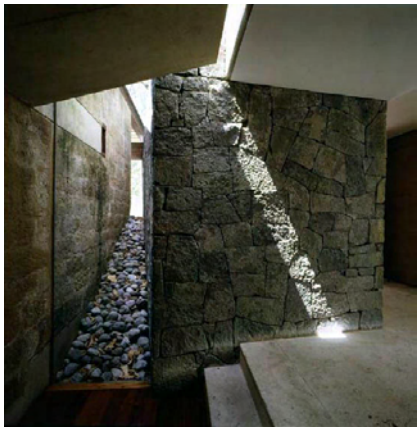
Alberto Kalach is an architect who lives and works in Mexico City. He concentrates his architecture on buildings that adapt to situations and places. Kalach watched his city be depleted through the years so he formed a project called Cuidad Futura, in collaboration with architects, engineers and environmental scientists, to address the problems that exist in the city. His creation of Town Lake was based on ecological, cultural, historical and aesthetic criteria. Kalach designed this housing area in the city specifically to create better spaces for interactions and social issues. He understands the importance of collaboration with the user in creating positive architectural projects. Also, he believes that rebuilding in the city allows for the reuse of forgotten, leftover spaces or abandoned land, which uplifts the spirit of society. He also is extermly interested in resolving the major water management problems that currently exist in Mexico City.

Location: Mexico City
Architect: Alberto Kalach (TAX architecture)
Size of Project: Buildings to large urban renewal projects
Types of Land: Forgotten, leftover or abandoned
Future: Continue to improve the depleting city

Urban _ grid design

Positive Urban Elements

_ Leftover, abandoned and forgotten sites
_ Rebuilding the city
_ Creating and allowing views
_ Houses and urban revival projects
_ Connecting to Nature through materials
_ Sustainable Practices
_ Importance on Collaboration



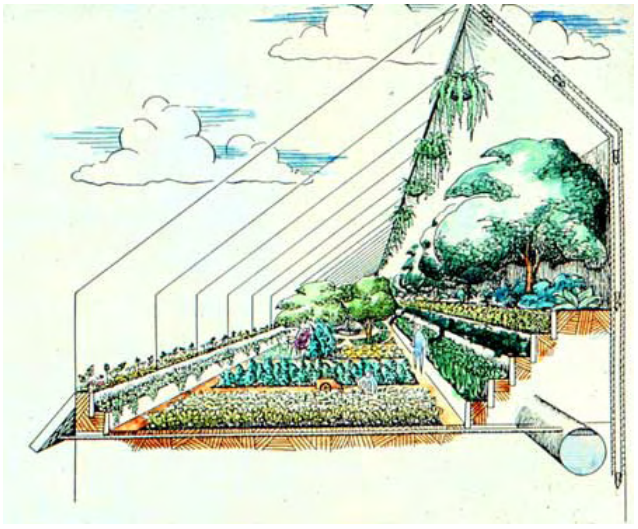
http://www.bombsite.com/issues/98/articles/2861
http://en.wikipedia.org/wiki/Alberto_Kalach
http://www.kalach.com/edificioadolf01.html
http://www.kalach.com/

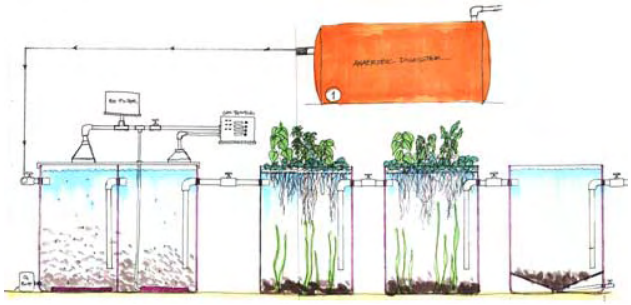
Living Machines

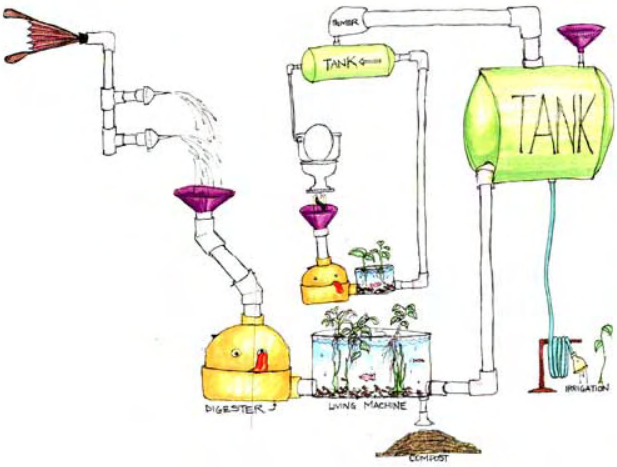
A Living Machine is a type of biological wastewater treatment designed as a bio-remediation system that produces different types of edible and ornamental plants and fish. Aquatic and wetland plants, bacteria, algae, protozoa, snails, clams, fish and other organisms are used to cleanse the waste water. John Todd was the initial developer of living machines when he began his own bio-shelter concept, New Alchemy Institute. Since the 1970's, John Todd and his wife Nancy have been creating and encouraging living machines since the 1970's with multiple books and are contributors to the emerging discipline of ecological engineering. Most of these systems are built in Europe although are not always referred to as "Living Machines", but they still clean and recycle waste water and runoff as well as provide food and a better composting system.

Kolding, Denmark is a sustainable community that has about 55,000 people living in a town that has an extensive water and sewage management program that has been used since the 1980's. The town uses low flow fixtures and also collects rainwater from all the roofs. The rainwater is collected in a pond and a tank and is then returned to the houses for grey water use (toilets, washing and gardening). The water is also collected, aerated and reused in the town. A glass pyramid-shaped "bioworks" greenhouse, located in the courtyard of a housing complex, is used for cleaning waste water and also as a community space that is safe and exciting for the children while being managed by the residents. "After the sewage is pre-treated in a small underground mechanical-biological sewage treatment plant and sterilized by a UV-ozone filter, the wastewater is pumped to the Pyramid where it is further purified by algae, plants, and crayfish and fish. From the Pyramid, the water flows into a reed-bed and infiltrates the soil. The original vision included growing vegetables in the Pyramid but health authorities would not permit this, and only well-trained personnel are allowed to manage the facility." There are artificial brooks, absorptive paving and play areas with sand and water wheel for the children. The town is said to have approximately 40,000 plants produced each year within the greenhouse that is operated with the sewage water that is created throughout the town by the inhabitants. This town is a truly a place for the inhabitants to learn and experience the way to live and survive sustainably.

Location: Kolding, Denmark (Sustainable Community)
Designer: John Todd Ecological Engineer
Size of Project: Buildings to large urban renewal projects
Population: 55,000 people in Community
Future: Early experimental Project is a success and town is still thriving

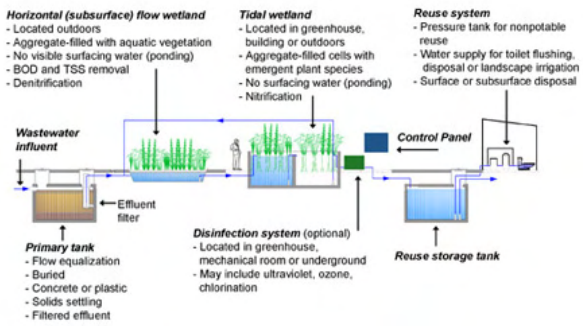






Positive Elements

_ Complete eco-system
_ Cleans waste water and runoff
_ Provides food for plants and animals
_ Composting System
_ Similar prices for non-efficient products
_ Kolding, Germany Pyramid



Eco Cities to Living Machines By John and Nancy Todd
http://en.wikipedia.org/wiki/Living_machines
http://yourdevelopment.org/briefcasestudy/view/id/46 >
http://www.cardiff.ac.uk/archi/programmes/cost8/case/watersewerage/kolding.html >
www.cardiff.ac.uk/archi/programmes/cost8/case/watersewerage/kolding.html

Colombia Community

This community practices its own techniques and creates its own technology based on its natural resources and necessities. The community is located in Las Gaviotas, Colombia that for the last 40 years has been living on its own devices. Its 200 residents have no guns, no police force, no cars, no mayor, no church, no priest, no cell phones, no television, no Internet. No one who lives in Gaviotas has a job title. Gaviotas does have an array of innovations intended to make human life feasible in one of the most challenging ecosystems, from small inventions like a solar kettle for sterilizing water to larger ones like a 19,800-acre reforestation project whose tropical pines produce resin for biofuel and a canopy under which native plant species flourish. Visitors who arrive at dawn on a Cessna plane leave before dusk. They see inventions such as a water pump powered by a children's seesaw, a solar kitchen and the forest of tropical pine trees that stands in contrast to the otherwise barren plains. The village uses resin from the pines for biofuel in its tractors and motorbikes, and its processes other resin for sale to use in products such as like varnishes and linseed oil. This example of a sustainable development creates techniques and traditions which relate to survival in that specific environment in Colombia. This is a truly sustainable development living like our ancestors did on secluded land with none of the necessities that we use today. This is currently an existing community.

Location: Las Gaviotas, Colombia
Architect: The community members
Size of Land: 20,000 + acres (middle of forest)
Population: 200 people
Future: Continue to thrive

Colombia _ location

Positive Elements - natural community

_ No job titles and modern technologies
_ Nature designed technology
_ Thrive and work together
_ Historic Sustainable Community

http://www.zeri.org/case_studies_reforestation.htm
Romero, Simon. An Isolated Village Finds the Energy to Keep Going, October 15, 2009
http://www.friendsofgaviotas.org/Friends_of_Gaviotas/Home.html
http://www.context.org/ICLIB/IC42/Colombia.htm
http://www.urbanecology.org.au/articles/gaviotas.html
http://www.nytimes.com/2009/10/16/world/americas/16gaviotas.html

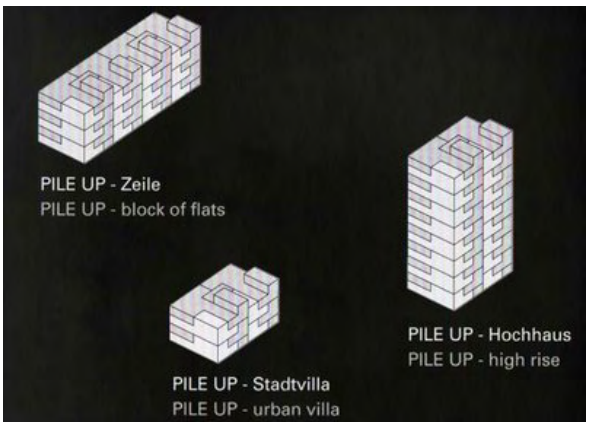
Pile Up Building

Hans Zwimpfer is an 78 year old architect from Switzerland who created the pile up house seven years ago, which is a combination of modules that are connected to create a more sustinable, desirable housing complex. The pile up or stack up projects are Zwimpfer's solution to suburban sprawl. His idea takes L shape living blocks and stacks them while preserving the ideals of a single home such as space, privacy and a yard. These designs are pre-fabricated and are stacked litke a tetris puzzle, creating unique blocks of living. The model allows for "the coforts of suburban living, with the convenience and ecological benefits of urban density." The outside walls are all load bearing so that the residents can change the interior to fit their needs, which allows for a flexible living environment. The land is still communal though each housing unit has its own private yard or balcony as well. Hans Zwimpfer has patented this idea of the pile up and stack up housing concept.

Location: Rheinfelden, Switzerland and other European Countries
Architect: Hans Zwimpfer
Size of Land: Urban or Suburban sites
Population: Range of inhabitants
Future: Continue to design Stack up or Pile up Houses

Positive Elements

_ Module design
_ Suburban living
_ Private & public yards
_ Needs & wants of user
_ Light, space and air
_ Flexible interior
_ Stackable living blocks



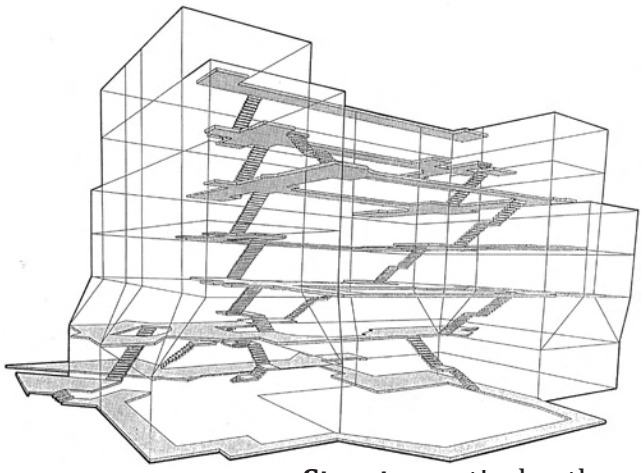
http://www.nytimes.com/2008/10/05/realestate/keymagazine/105hspile-t.html
http://communities.bentley.com/blogs/jasonsteins_blog/archive/2008/10/07/ny-times-looks-at-hans-zwimpfer-housing-stack.aspx
http://www.zwimpferpartner.ch/
http://www.designboom.com/weblog/cat/9/view/4290/pile-up-house-concept-by-hans-zwimpfer.html
http://www.zapco.ch/index.php?id=52&L=1

Next 21 Housing

The project contains 16 housing units in the city of Osaka in Japan. The skeleton was originally planned as a uniform space containing 16 units which was transformed into a community with lots of lively activities that reflect individual characters of the architects and residents. Thirteen architectural firms were involved in the project each competing through design for a unit house which each cater to the wishes of the perspective residents or the site conditions that were assigned. Meeting the clients demands was necessary and the system of the building enables order and comfortable coexistence of people who share different values and beliefs. The building is supposed to live for 100 years and was built to be flexible and durable. The structure was built first consisting of pillars, beams and floors and the after the inhabitants designed their interior spaces while following the rule book. The structural system, which is built in a module, was constructed to allow for easy maintenance and repair if necessary.

Location: Osaka City, Japan
Architect: Y. Utida & Shu-Koh-Sha Architectural & Urban Design
Size of Site: 1,542.92 m2 (60% ground floor covered)
Population: 18 houses
Future: continue to create individuality in city housing

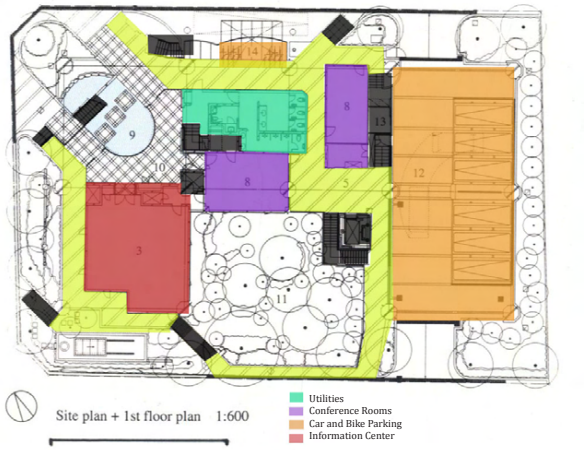
View _main corner view

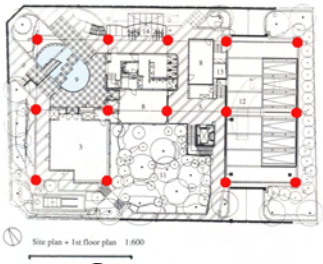


Streets _vertical paths

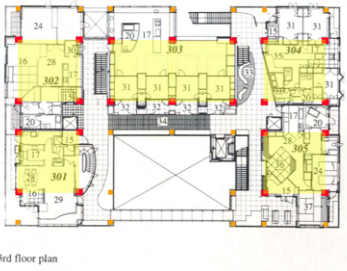
Positive Elements

_ Module design
_ Exterior Streets
_ Corner lot in the city
_ Private/Public green's
_ Flexible interior
_ Natural Sunlight
_ Individualistic

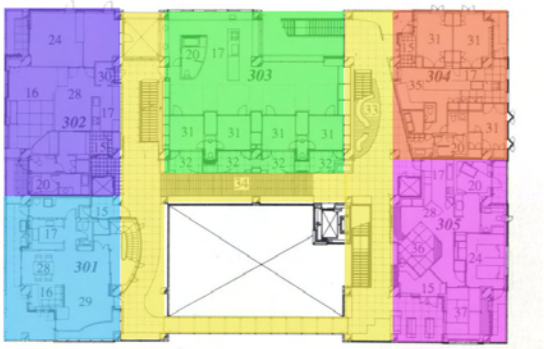




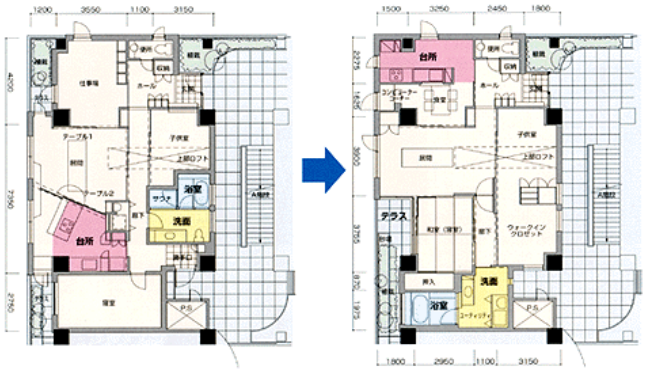
Structure _ ground floor



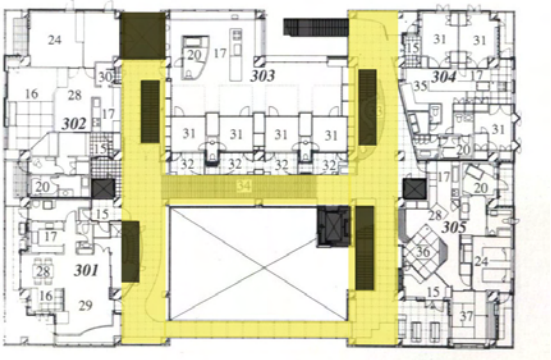
Structure _ upper floors



Plan _ layout organization



Flexible _ redesigned interior



Circulation _ stairs in black

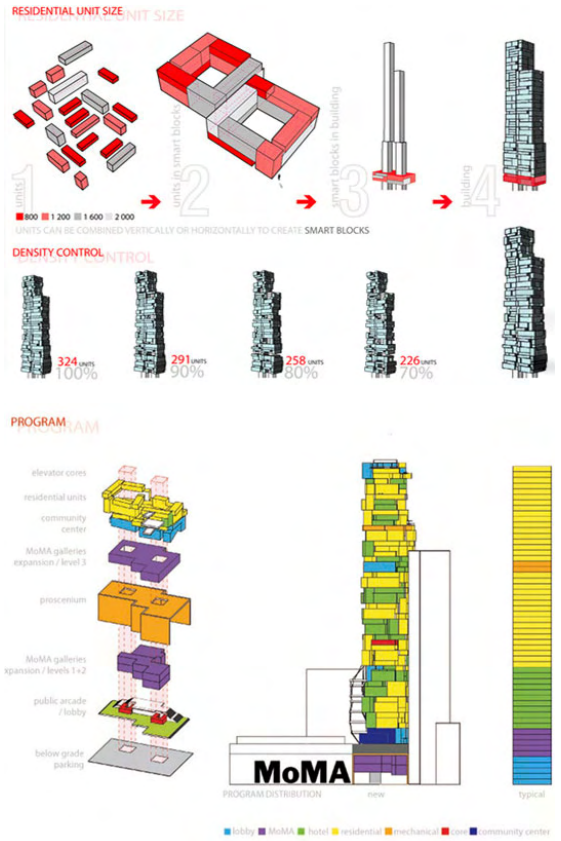
New York City's Museum of Modern Art (addition)

This project is a type of method for organizing the tall building as a "vertical neighborhood", it is explained that the project consists of what you would find in several city blocks but turned sideways and stacked up. This project is not just a museum but mixes and mingles museum space, offices, brownstones, apartment buildings, hotels, restaurants, shops, green spaces, clubs and market spaces. The open air corridors and bridges that move from floor to floor make the inhabitants life easier since all their public amenities are within the building. The difference between this design and other similar vertical villages is that instead of having a conventional slick design that reflects uniformity and cohesion, this design reflects cultural diversity of the city and its inhabitants. The project is constructed like jenga blocks known as the "smart blocks" which allows different configurations which are all started on the ground floor with two vertical cores that run throughout the project. Single units, duplexes and triplexes are scattered around the project and allow for unique surface texture and possibilities.

Location: 53 W. 53rd Site, New York City
Architect: John Bechmann and his firm, Axis Mundi
Size of Site: Vertical Project
Population: a couple city blocks stacked vertically
Future: Currently a competition, might be built!

Positive Elements

_ Based off Core concept
_ Open air corridors
_ Addition to existing building
_ Private and Public amenities
_ Reflects the cultural identity of the city
_ Built for natural sun and breezes
_ Rotating module - jenga blocks

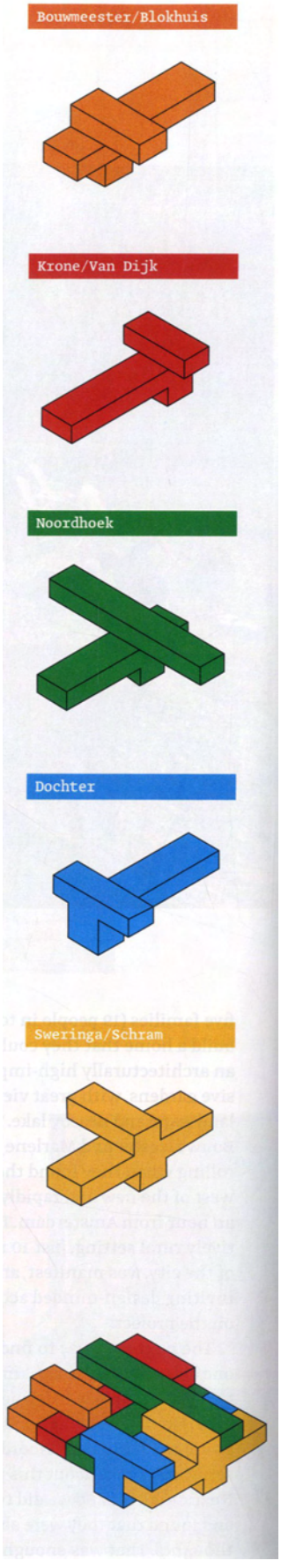


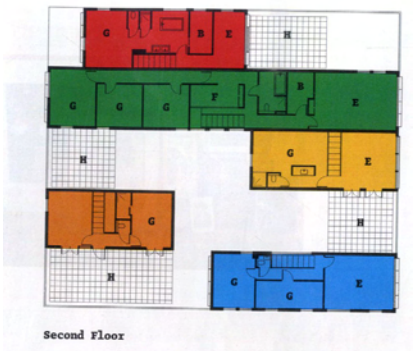
http://media.photobucket.com/image/vertical%20building%20cartoon%20image/gilding_the_lily/Art/moma11.jpg
http://www.inhabitat.com/2009/07/16/axis-mundi-unveils-alternative-design-for-moma-tower/
http://www.designboom.com/cms/images/ridnew/moma02.jpg
http://stephenbrammer.wordpress.com/tag/water/

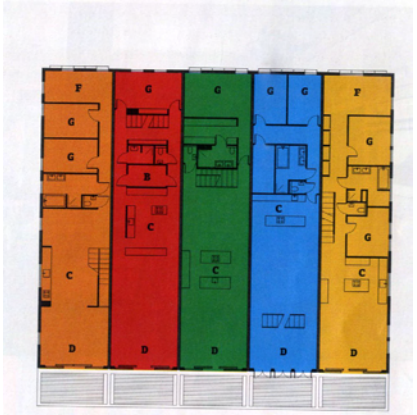
Villa Van Vijven

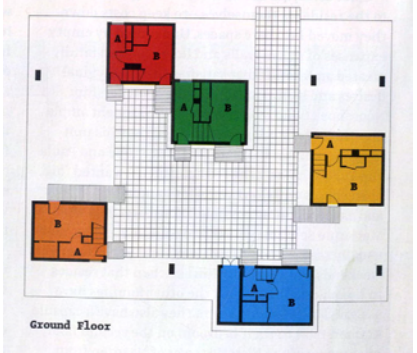
This project began with five families that wants to build a home that they could otherwise not afford alone with great gardens, panoramic views and a nearby lake. With a ten minute drive the nearest city, the sculptural bright orange house allows each family to have their own entrances, gardens, balconies and views. They all have unique views with completely different interiors, allowing for the inhabitants to feel like they each have their own home and space, most do not feel like it is communal living. The family members were greatly involved with the design phase with the architects. The architects knew what their clients needed and did an amazing job fulfilling all their needs and wants. The orange facade was designed into the project to relate the house back to the standards orange tiled houses in Holland.

Location: Almere, the Netherlands
Architect: Next Architects and the family members
Size of Site: 5,000 m2
Population: Five families (19 people) - largest unit is 3,200 sf
Future: Teach other families how to work, design and live together









Positive Elements

_ Communal effort and help (design)
_ Simple, module design
_ Separate entrances
_ Individual and Communal gardens
_ Private decks and balconies

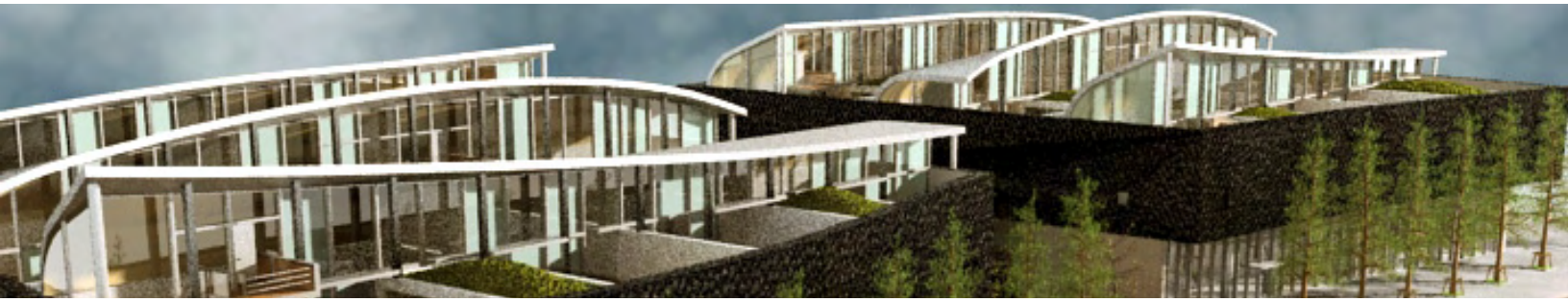
http://www.dwell.com/articles/Creative-Commons.html
http://www.almerenjoy.nl/architectuur_woonwijken.htm
http://www.mimoa.eu/projects/Netherlands/Almere/Villa%20Overgooi
Dwell Magazine, Dec./Jan. 2009 (pg. 93-99)

Hydroponic Gardens

Hydroponic gardens which are plants grown without soil, are becoming very popular among the world of gardeners. The product that is produced from hydroponic gardens creates a larger yield quicker as well as grows a healthy and perfect plant. Hydroponic gardens are consistently reliable and if used indoors near the windows or with artificial lighting, you can have fresh food all the time.

Company: Bright Farm Systems
Product: Urban Hydroponic Rooftop Gardens
Goal: Design an educational buildings and food supply
Website: www.brightfarmsystems.com

http://www.hydroponicvegetablegardening.com/



Nexus World Housing

OMA designed the Nexus World Housing in a busy city in Japan and the housing project has been a huge success and popular among the city. There are 24 units in the complex, each being three stories with a patio and balcony. The units are designed in close quarters but have ample light and air circulation throughout the units. Each unit has its own private entrance onto ground level which is provided for the public. This public realm on the ground level is the only spot the inhabitants can bump into one another since there are no communal or social gathering spaces. They units are built close to each other, while at the same time you may never see or know your neighbor that lives on the other side of the wall.

Location: Fukuoka, Japan
Architect: OMA
Date: 1991
Lot size: 2 blocks
Units: 24 Houses, 3 stories and packed together

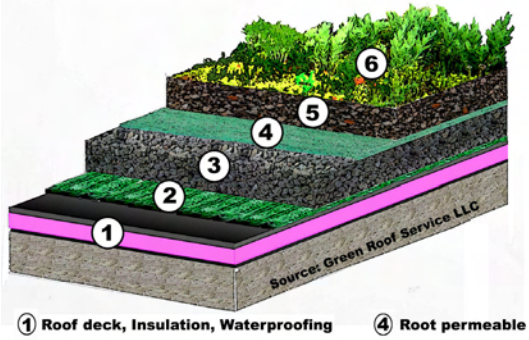
http://www.oma.eu/index.php?option=com_projects&view=project&id=223&Itemid=10

Green Roofs / Fresh Food / Market Places

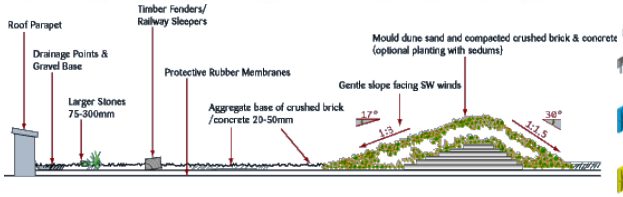
Gardens have been around for years, but green roofs are the beginning of the new farmers garden specially in cities. Fresh food and market places have always been popular but have become less common during our years because of the cheaper prices of imported foods. Green roofs, fresh food and market places are all becoming more popular in the United States like they are already in Europe. People are becoming more sustainable and realizing that we should support our local farms specially because you know what is being put on your locally food products.

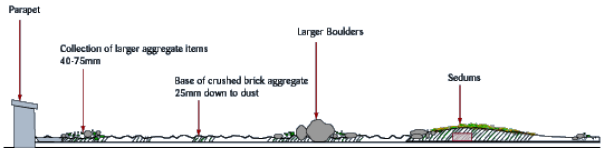
Company: Rhode Island Farmers
Product: Fresh Foods / Sustainable
Goal: Create a Better Living Environment
Website: www.farmfresh.org

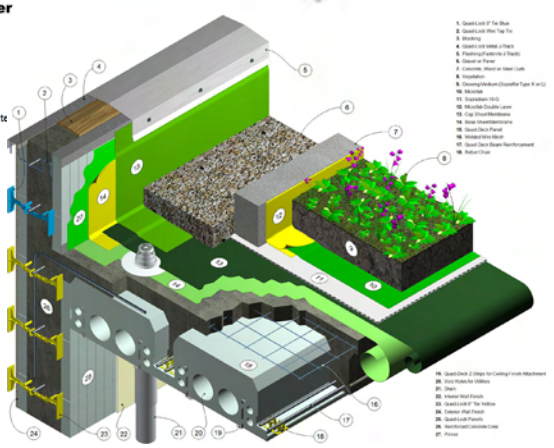
Functional layers of a typical extensive Green Roof



① Roof deck, Insulation, Waterproofing
② Protection- and Storage Layer
③ Drainage- and Capilarity Layer
④ Root permeable Filter Layer
⑤ Extensive Growing Media
⑥ Plants, Vegetation

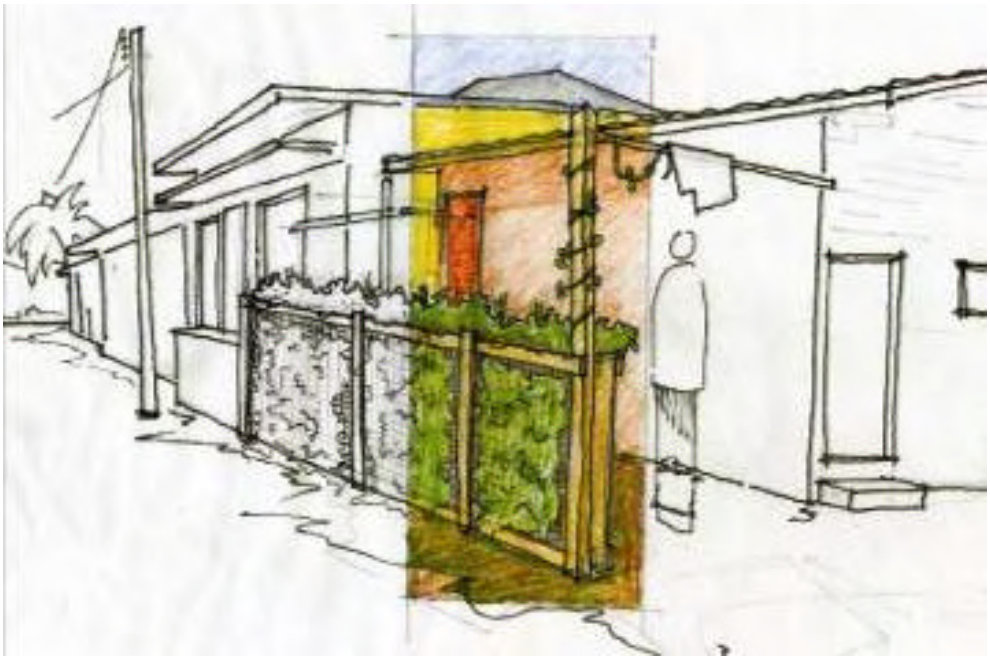




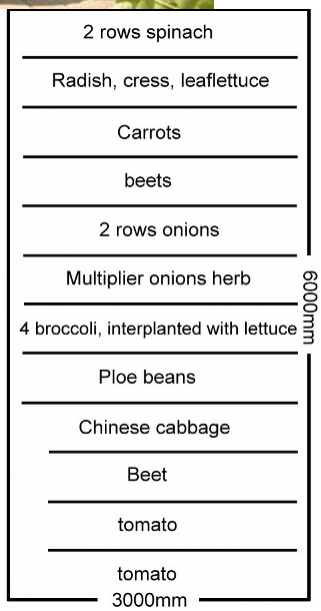


Vikram Bhatt

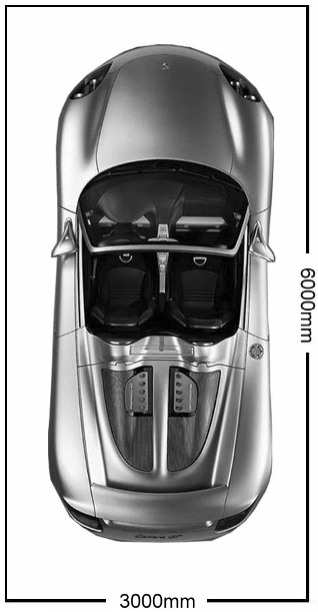
Vickram Bhatt is a professor of Architecture at McGill University in Canada where he focuses on housing and sustainable living. He teaches studio on all types of housing and has done a redevelopment project in slums and low income neighborhoods with his students. They design creative ways of farming that would allow the areas to look nicer and become a bit more colorful. He has also started a program on the main campus, known as the edible campus. With the help of students and volunteers they have potted a variety of edible foods throughout the main courtyards throughout campus. They have had so much help and support that it has continued for the past few years already and continues to grow every season.

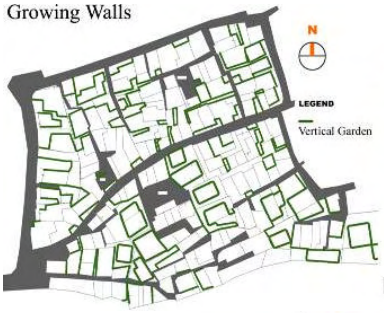


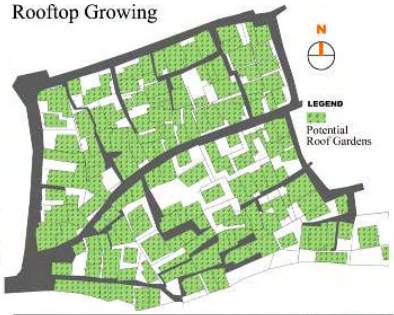
Growing Walls



Rooftop Growing







Plan of Gardens

Pergolas

http://www.mcgill.ca/architecture/faculty/bhatt/

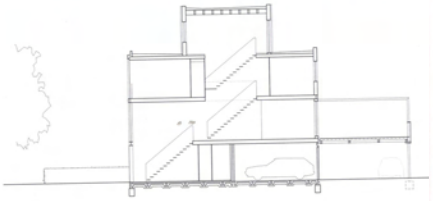
http://www.mcgill.ca/mchg/projects/ediblecampus/

Experimental Housing, 2004 - 2008

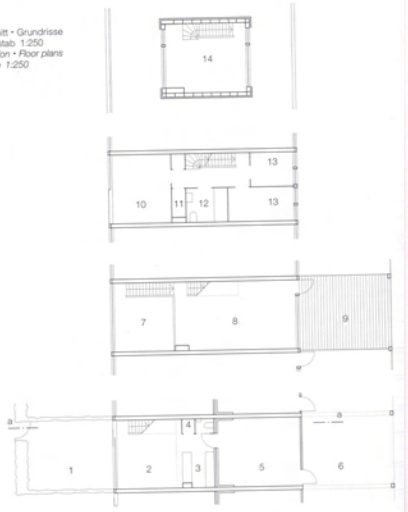
The townhouse units are created with open interiors to allow air flow and lots of sun light to all the rooms. There is a covered car port and street, which is where the exterior balconies come on to. The front, south facing yard is enclosed and the south wall is completely glazed.

Location: Germany
Architect:
Population: 23 Townhouses

2a 2b

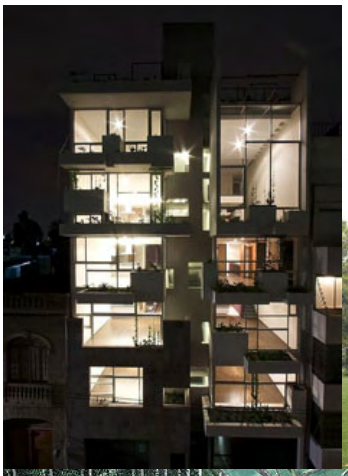


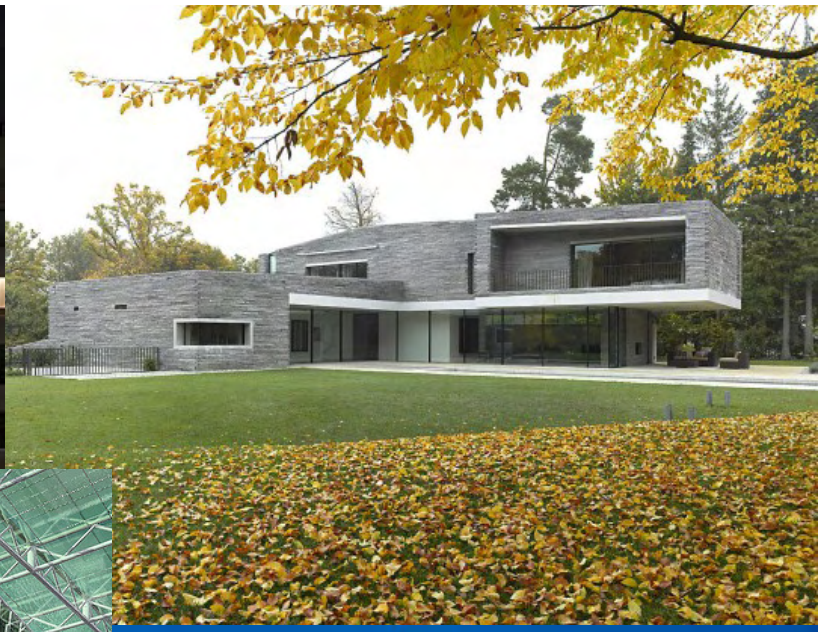
Schnitt • Grundrisse
Maßstab 1:250
Section • Floor plans
scale 1:250

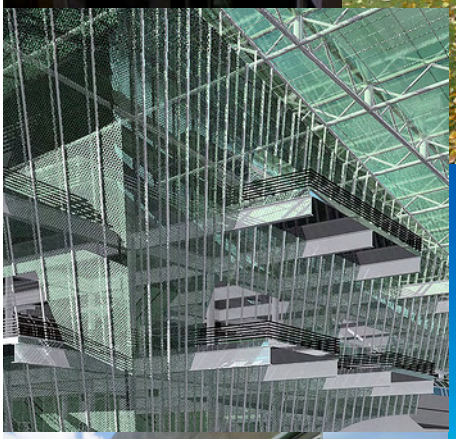


Tower / Balcony Inspirations

Designing the garden spaces on the tower was a challenge since the designs and inspirations are endless. There are a lot of different options to choose from when you are looking for a similar balcony that protrudes off the building creating a large cantilever. The balconies on the tower were straight, short, longer, curved, bent and now they wrap around to have a larger bacony at the most southern side of the tower.



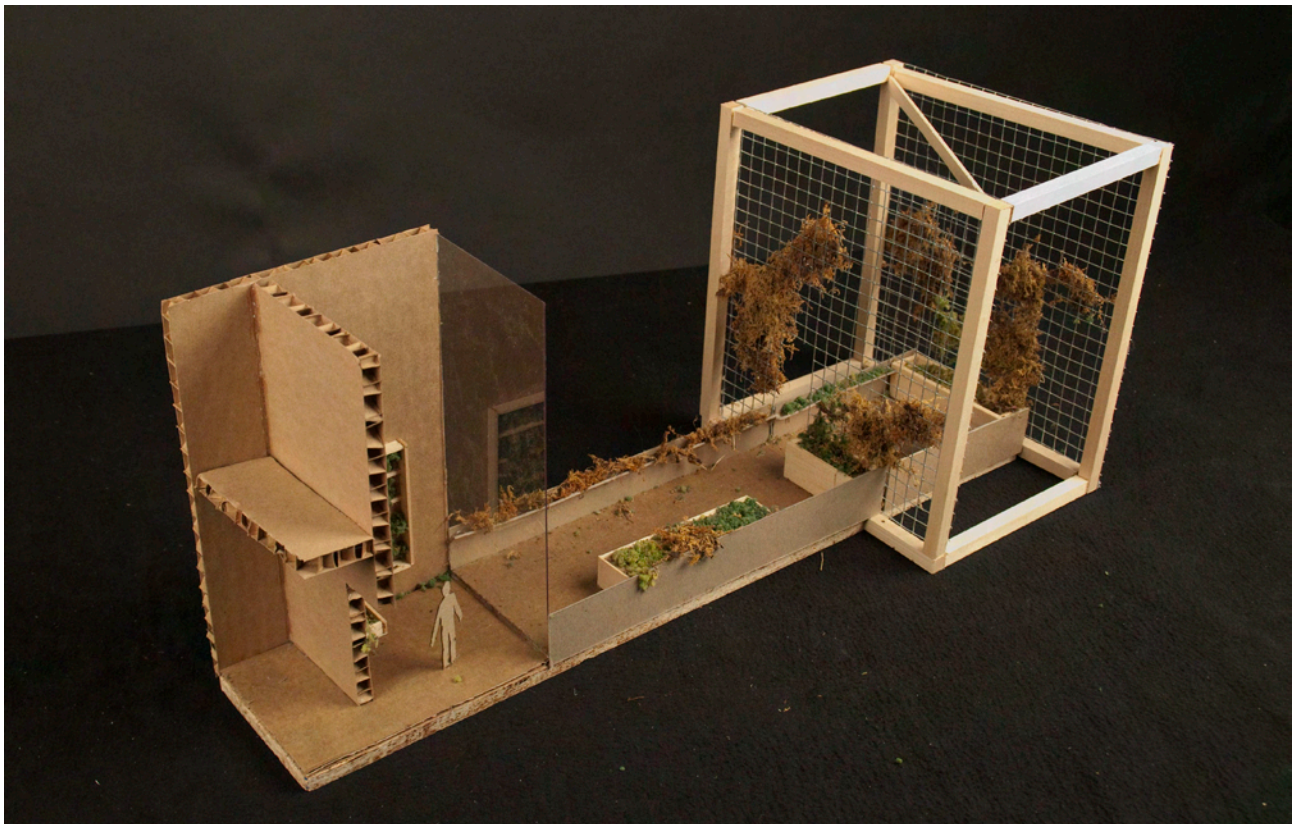


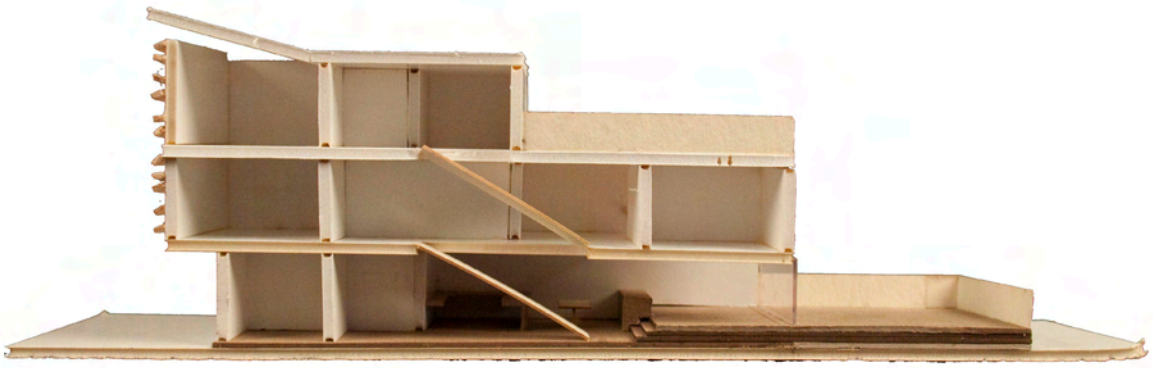


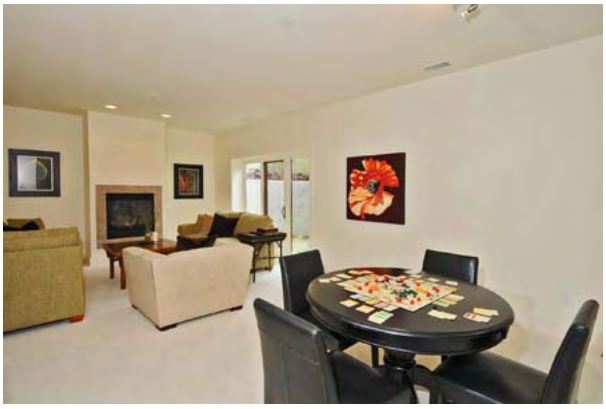
http://www.mcgill.ca/architecture/faculty/bhatt/

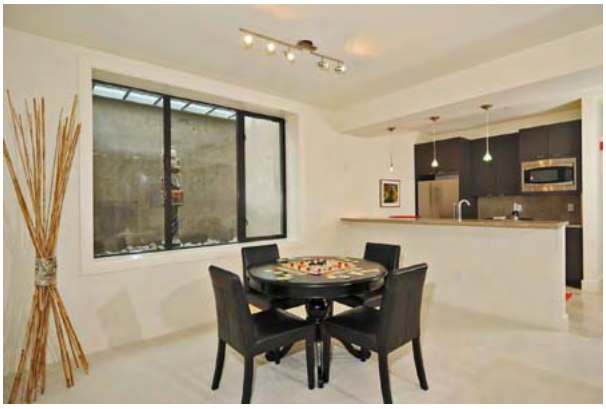
http://www.mcgill.ca/mchg/projects/ediblecampus/

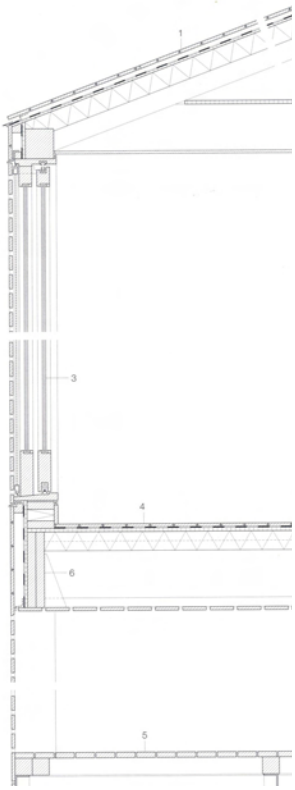
Interior House Inspirations

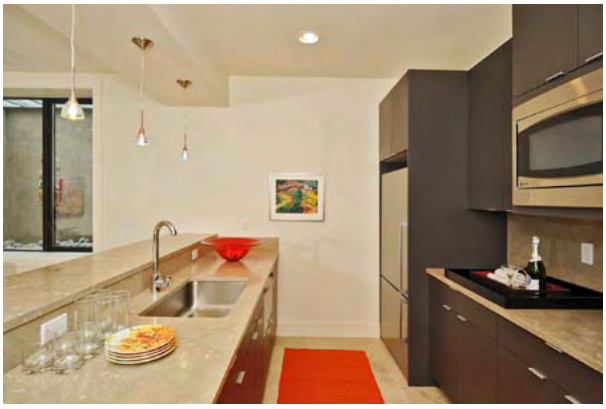


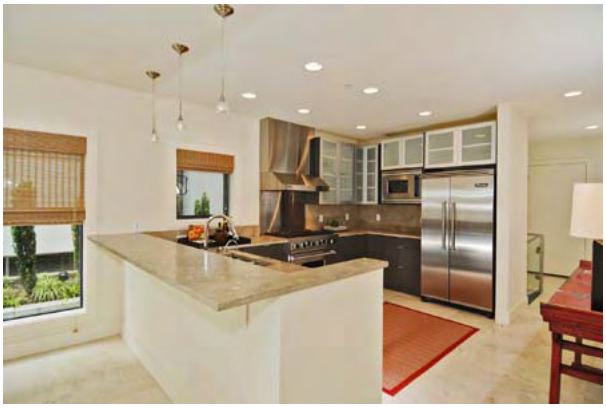










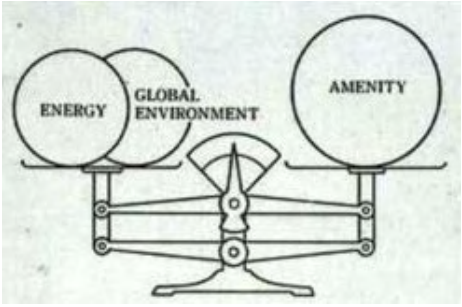


Appendix VI: Case Study Powerpoint

"Man has come to congregate in the city, and as such housing today inevitably faces completely different problems from when Man lived in the natural environment -- the problem of the right mode of housing in a society where lifestyles are becoming more diversified and in an information society that is becoming more advanced; the problem of natural resources and pollution countermeasures that come with increased energy requirements; the problem of constructing houses that can adapt to changes in society and our lifestyles. Each of these problems are interlinked and cannot be solved on their own.

NEXT 21 is an experimental housing project designed for coming to grips with these problems through continuous trial and error. I feel that the joint cooperation of specialists in the fields of construction and the environment for actually constructing a single, localized form of building is highly significant."

Y. Utida (Committee, Professor, Meiji Un. Chairman)



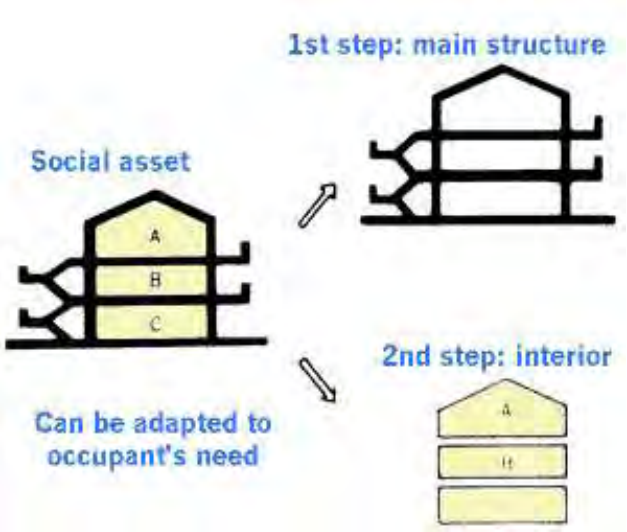
Project: **Osaka Gas Next 21 Project**
Owner: **Osaka Gas Company, innovative gas housing project**
Skeleton design: **Y. Utida & Shu-Koh-Sha Architectural & Urban Design**
Completion: **October 1993**
Construction Work: **Obayashi Corporation**
Site Area: **1,542.92 m2 (approx. 1,600 sqaure feet)**
Zoning: **Residential zone**
Building Coverage: **60% of site**
Green Area: **1,000 m2 about 25% of total floor area**
Height: **25.42 meters (approx. 83 feet tall)**
Levels: **6 floors above ground, 1 floor below ground**
Total Floor Area: **4,577.2 m2 (approx. 50,000 sqaure feet)**
Basement 915 m2, Floor 1 -5 600-700 m2, Floor 6 445.9 m2, roof 14 m2
Parking: **Total 20 cars - 3 stage vertical parking (2 stories)**

Above: Exterior View of the Next 21 Project and the city behind.

Left: Walkability and realtionship of Next 21 Project to the city.

Below: Cartoon sketch of "green" intentions for the Next 21 Project in the future

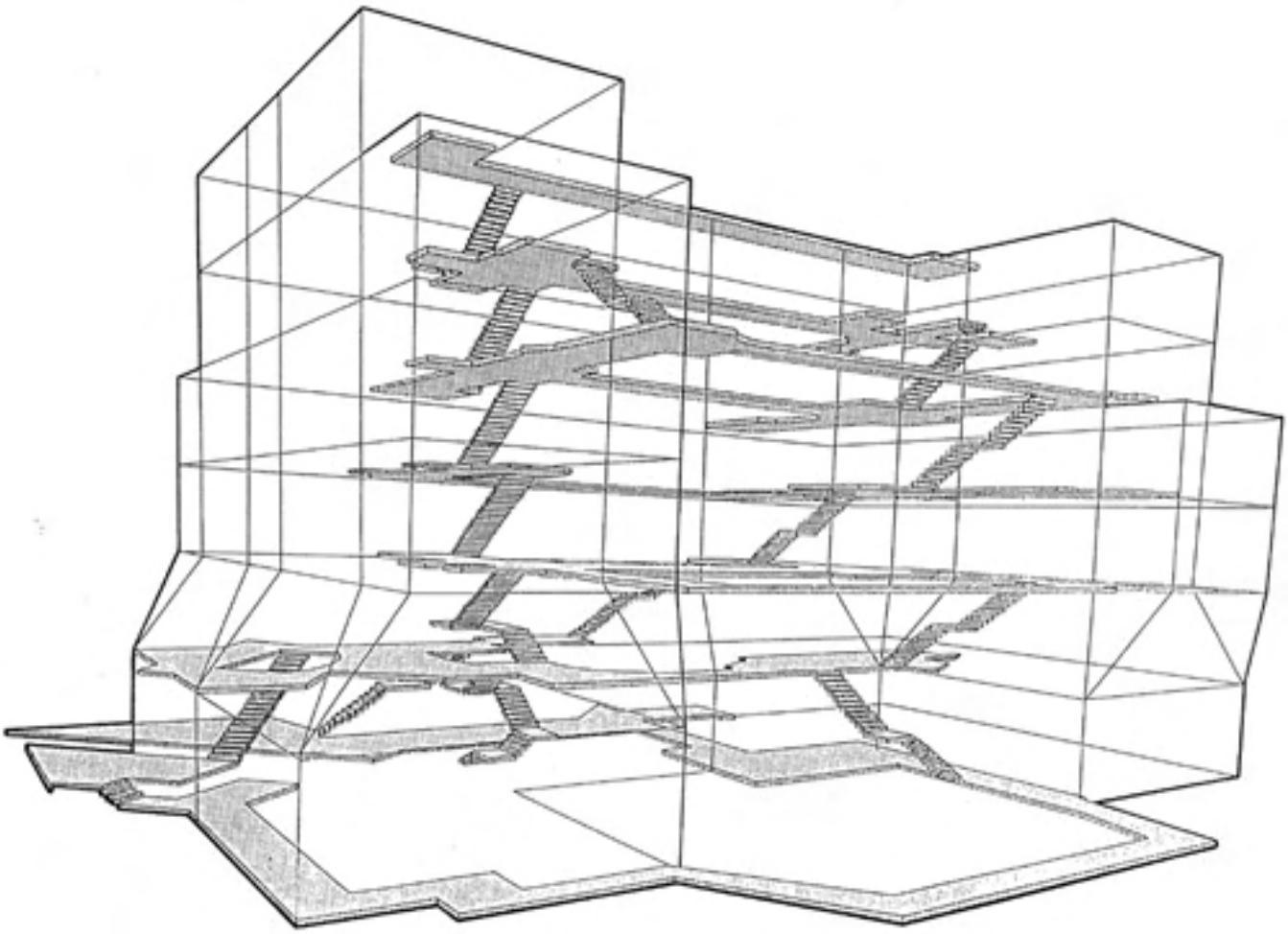
The project contains 16 housing units in the city of Osaka in Japan. The skeleton was originally planned as a uniform space containing 16 units which was transformed into a community with lots of lively activities that reflect individual characters of the architects and residents.



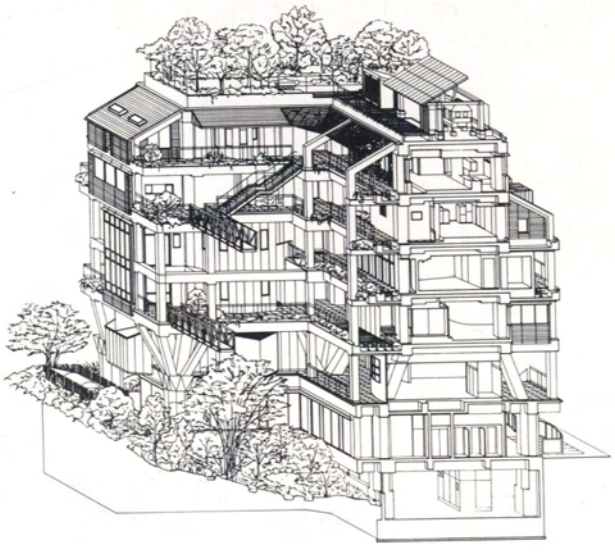
Thirteen architectural firms were involved in the project each competing through design for a unit house which each cater to the wishes of the perspective residents or the site conditions that were assigned. Meeting the clients demands was necessary and the system of the building enables order and comfortable coexistence of people who share different values and beliefs.

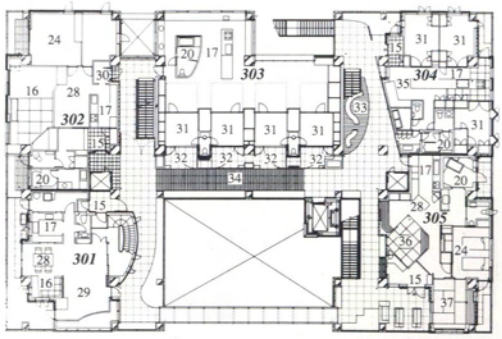
The building is supposed to live for 100 years and was built to be flexible and durable. The structure was built first consisting of pillars, beams and floors and the after the inhabitants designed their interior spaces while following the rule book. The structural system, which is built in a module, was constructed to allow for easy maintenance and repair if necessary.

Experimental project dealing with the relationship between Man and City
-- How technology should be developed in the future
-- How urban buildings need to be transformed for the future

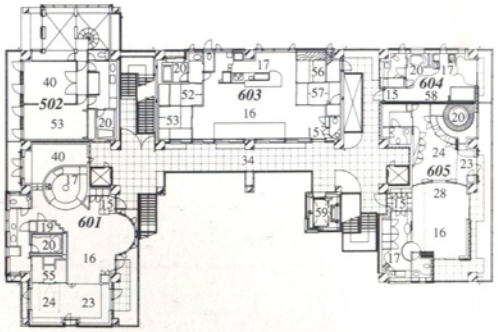


Above: Final massing alternative with vertical circulation and streets
Left: Exterior perspective of project showing the relationship to the street
Below: Sectional Axon of Next 21 Project

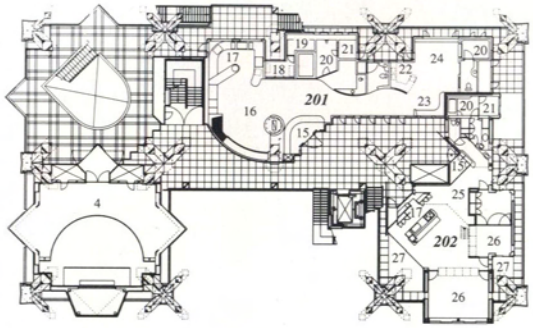




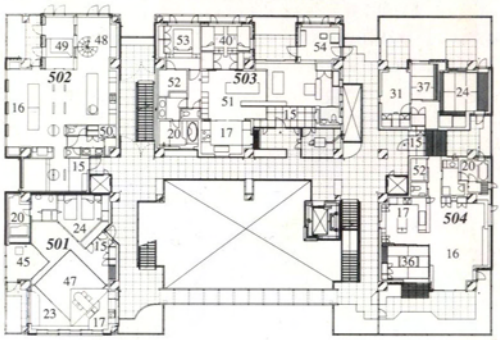
3rd floor plan



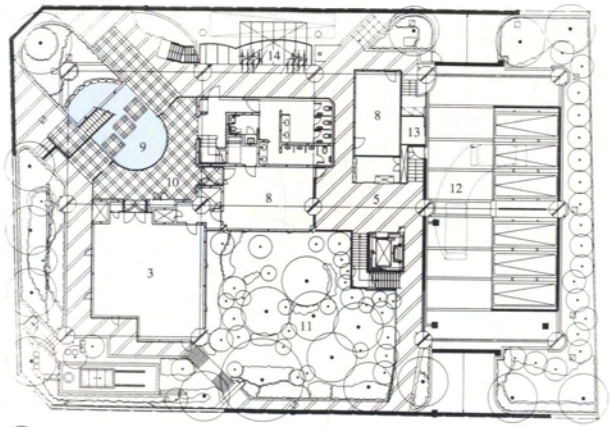
6th floor plan



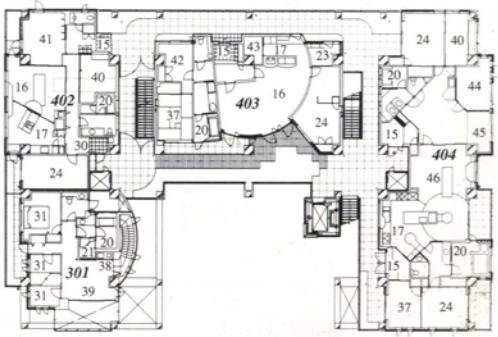
2nd floor plan



5th floor plan



Site plan + 1st floor plan 1:600

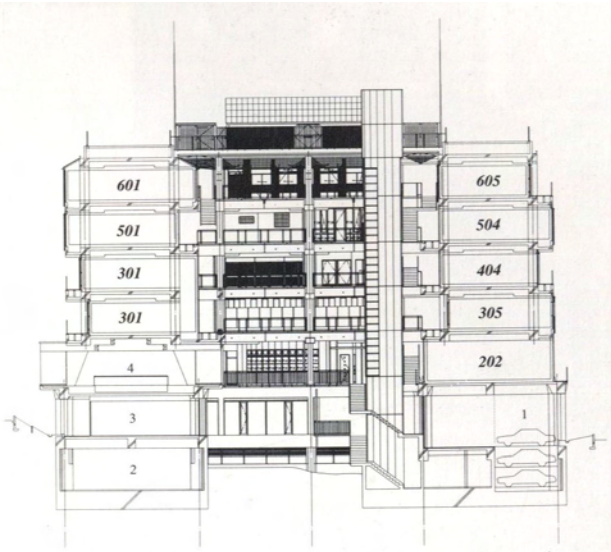


4th floor plan

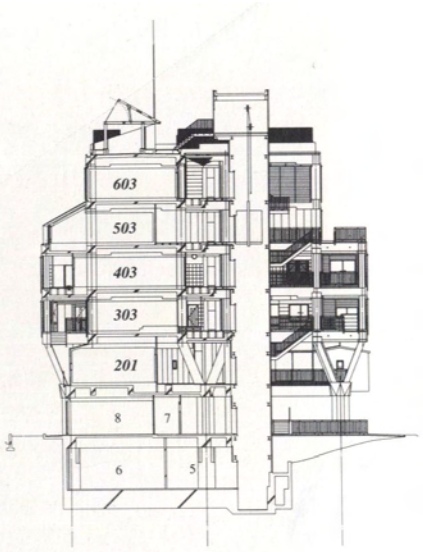
3 自然情報センター Nature/Information Center
4 NEXT21ホール NEXT 21 Hall
5 エレベーターホール Elevator hall
8 会議室 Conference room
9 池 Pond
10 エントランスホール Entrance hall
11 エコロジカルガーデン Ecological garden
12 車路 Drive way
13 ゴミ置場 Garbage depot
14 自転車置場 Bicycle parking
15 玄関 Entrance
16 居間 Living room
17 台所 Kitchen
18 庭 Garden
19 機械室 Machine room
20 浴室 Bathroom
21 サウナ Sauna
22 セカンドキッチン Second kitchen
23 書斎 Study
24 寝室 Bedroom
25 上部ロフト Loft
26 居室 Sitting room
27 バルコニー Balcony
28 食堂 Dining room
29 多目的室 Multi-purpose room
30 勝手口 Service entrance
31 個室 Bedroom
32 縁側 Veranda
33 プレイロット Play lot
34 廊下 Corridor
35 共用室 Common space
36 茶の間 Sitting room
37 和室 Japanese style room
38 ミニキッチン Kitchenette
39 談話ロビー Lobby
40 子供室 Children's room
41 仕事場 Workshop
42 洋室 Western style room
43 食品庫 Pantry
44 趣味室 Den
45 内部テラス Roof terrace
46 食事室 Dining room
47 居間兼スタジオ Living room/studio
48 アトリウム Atrium
49 プール Pool
50 シャワー室 Shower room
51 居間・食堂 Living/dining room
52 納戸 Closet
53 主寝室 Master bedroom
54 洗濯・乾燥室 Laundry/drying room
55 収納 Closet
56 茶室 Tea ceremony room
57 座敷 Japanese style room
58 居間・寝室 Living room/bedroom
59 エレベーター Elevator

No. 201 MA MAISON（私の家） Ma Maison
No. 202 Tepee広場の家 Tepee House
No. 301 ガーデンハウス Garden House
No. 302 ヤングファミリーの家 Young Family House
No. 303 自立家族の家 Independent Family
No. 304 拡大家族の家 Extensive Family
No. 305 アクティブシルバーの家 Active Oldsters' House
No. 402 仕事場のある家 House with Office
No. 403 ハーモニーの家 Harmony House
No. 404 3世代ファミリーの家 3-generation Family House
No. 501 フィットネスルームのある家 Fitness Room House
No. 502 ホームパーティーの家 Home Party House
No. 503 手づくり工房の家 Handmade Workshop
No. 504 安らぎの家 Relaxed House
No. 601 創時間の家 Time Create House
No. 603 "き"がわりの家 Changeable House
No. 604 アーバンシングルの家 Urban Single House
No. 605 DINKS APARTMENT DINKS Apartment

Above: Plans
Right: Sections and Elevations



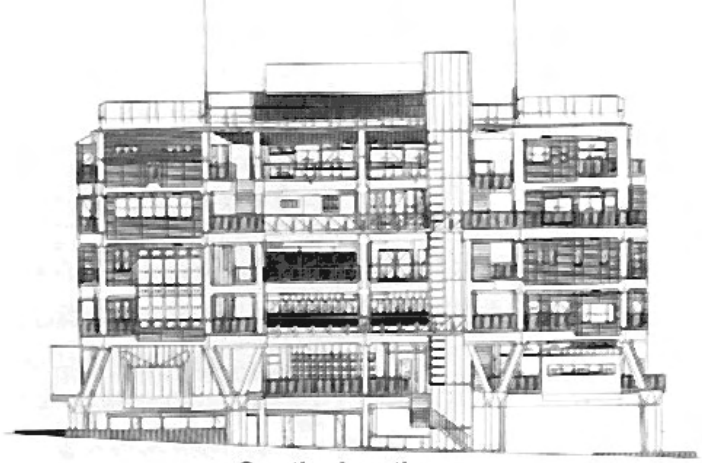
Section 1:600



Section 1:600

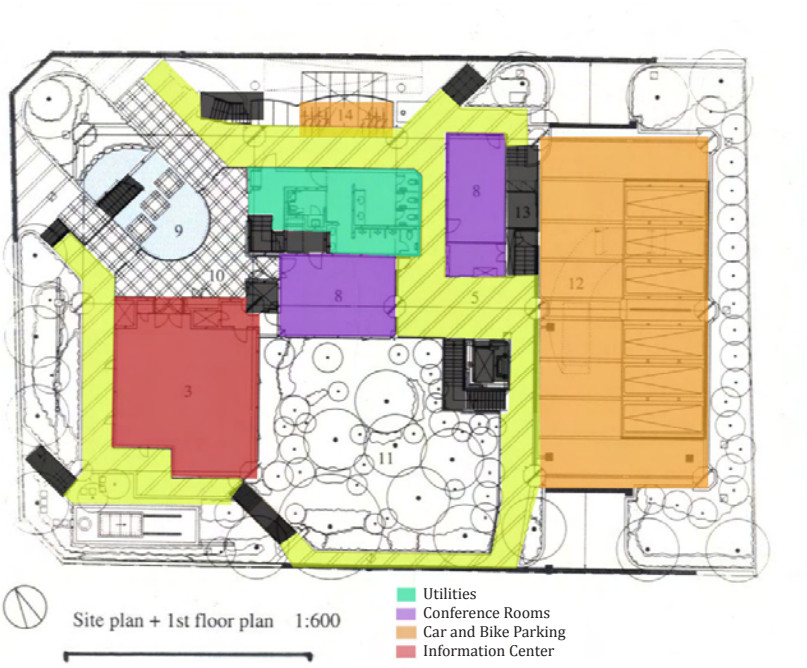
1 駐車施設 Parking facility
2 生ゴミ·水処理室 Garbage and water treatment room
3 自然情報センター Nature/Information Center
4 NEXT21ホール NEXT 21 Hall
5 エレベーターホール Elevator hall
6 電気室 Electric room
7 宅配·郵便ホール Mail and delivery hall
8 会議室 Conference room

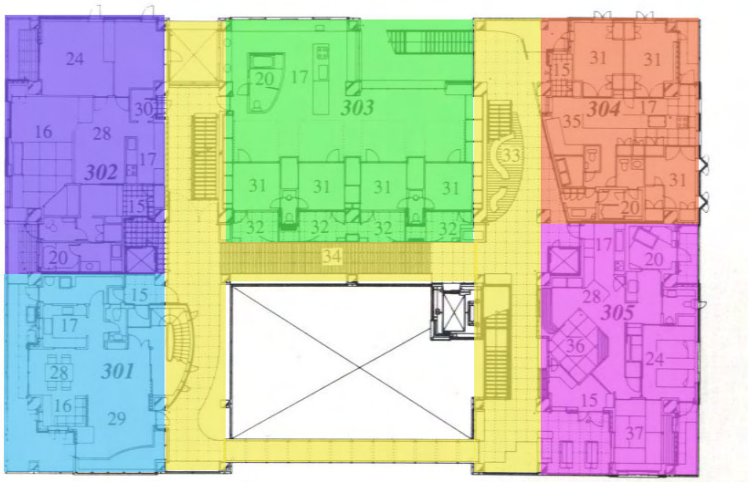
No. 201 MA MAISON（私の家） Ma Maison
No. 202 Tepee広場の家 Tepee House
No. 301 ガーデンハウス Garden House
No. 303 自立家族の家 Independent Family
No. 305 アクティブシルバーの家 Active Oldsters' House
No. 403 ハーモニーの家 Harmony House
No. 404 3世代ファミリーの家 3-generation Family House
No. 501 フィットネスルームのある家 Fitness Room House
No. 503 手づくり工房の家 Handmade Workshop
No. 504 安らぎの家 Relaxed House
No. 601 創時間の家 Time Create House
No. 603 "き"がわりの家 Changeable House
No. 605 DINKS APARTMENT DINKS Apartment



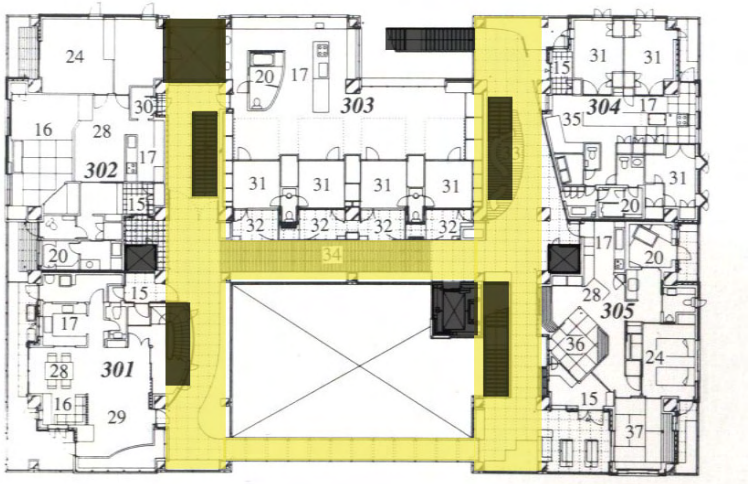
South elevation

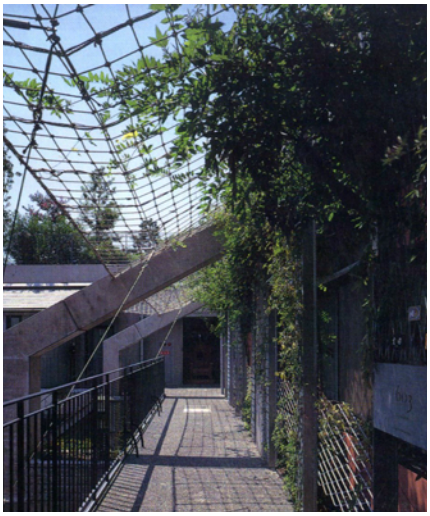
West elevation



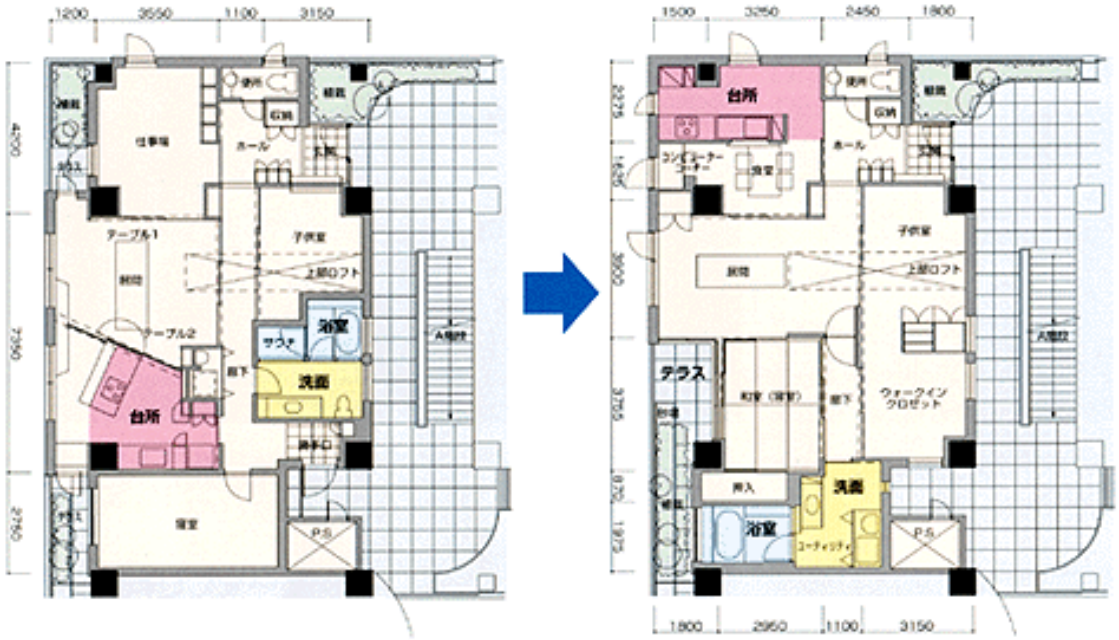


Plans - Room Layout

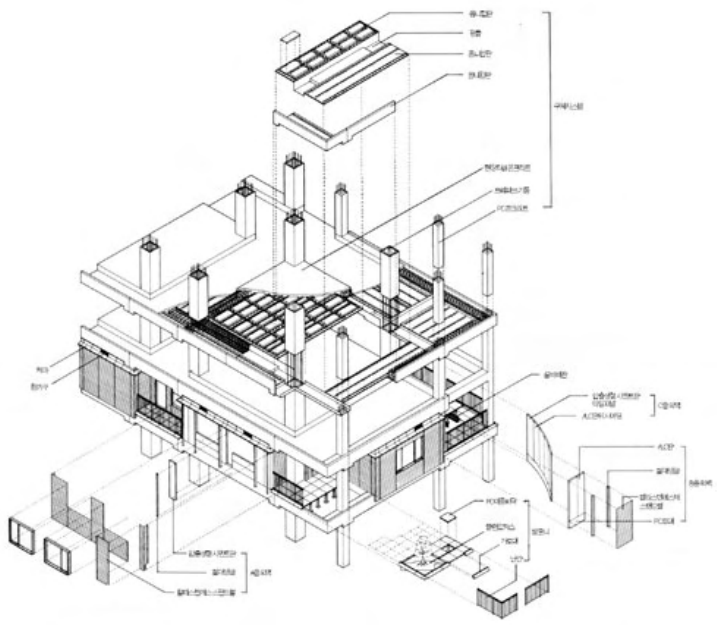


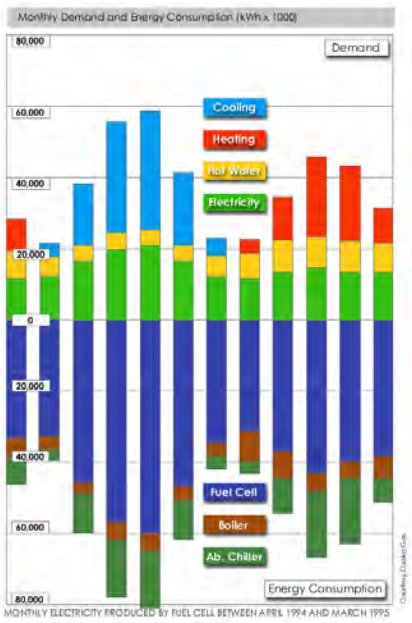


Circulation

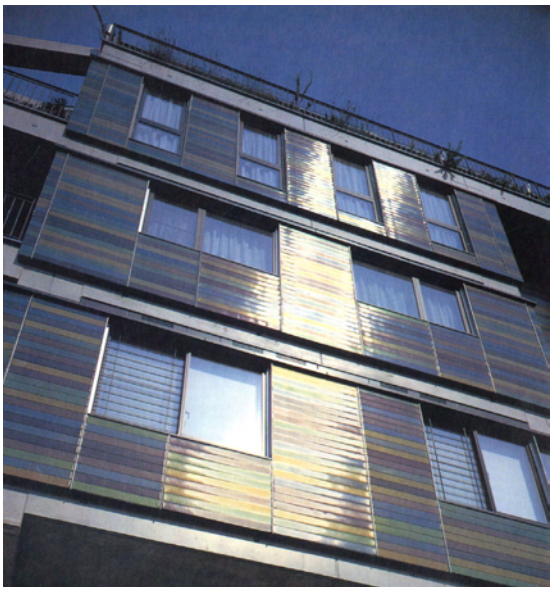


Flexible Room Layouts





Savings



Ma Mansion (201) - Proposal / Sample House

EXPERIMENTAL LIVING HOUSE

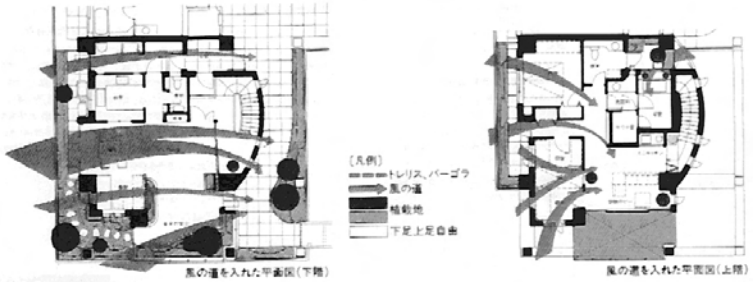
TePee House (202)

LIFESTYLE-ORIENTED HOUSES

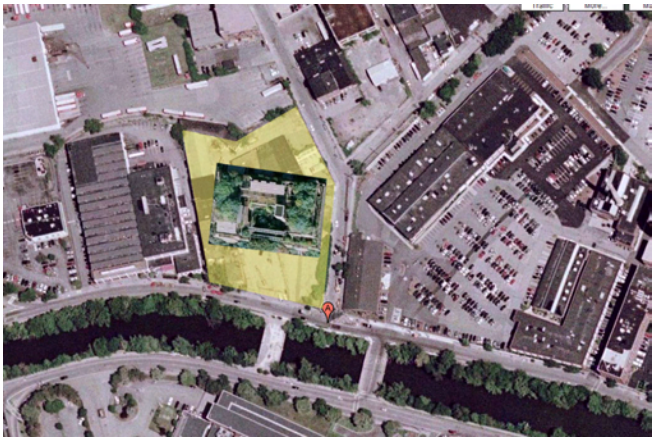
Garden House (301)
Independent Family (303)
Young Family House (302)
Extensive Family (304)
House with Office (402)
3-generation Family House (404)
Fitness Room House (501)
Home Party House (502)
Homemade Workshop (503)
Time Create House (601)
Changeable House (603)
Urban Single House (604)
DINKS Apartment (605)

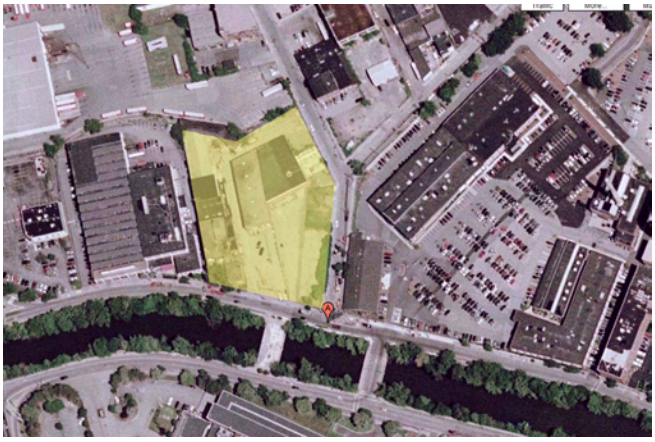
INHABITANT PARTICIPATION HOUSES

Active Oldster's House (305)
Harmony House (403)
Relaxed House (504)



Exterior Perspectives of Next 21

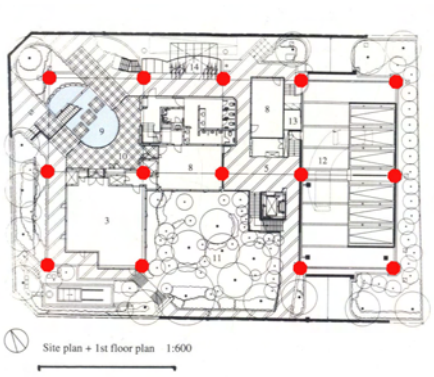


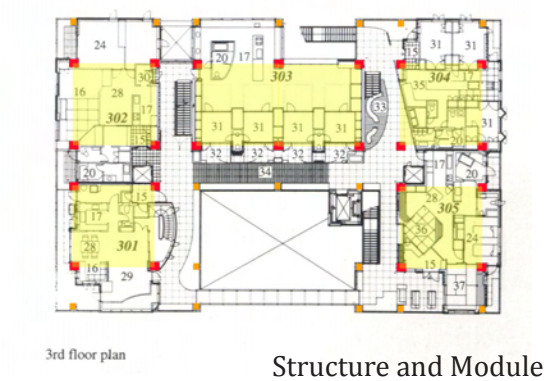


Promenade Street Site and Next 21 Site

Structure:

Pile/Foundation and pre-cast concrete/reinforced concrete





Structure and Module

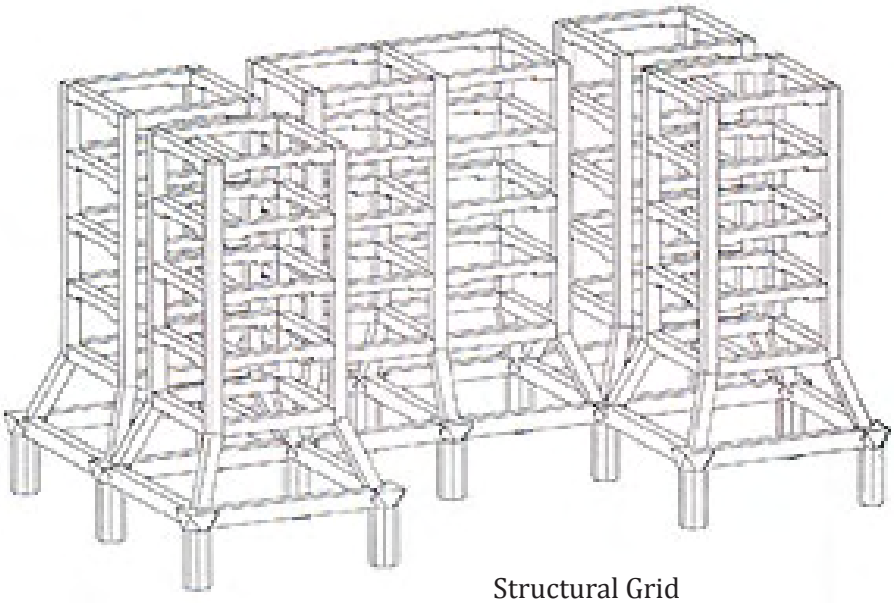
Air Conditioning Facilities:

Absorption chiller - heater, VAV ventilation air - condition

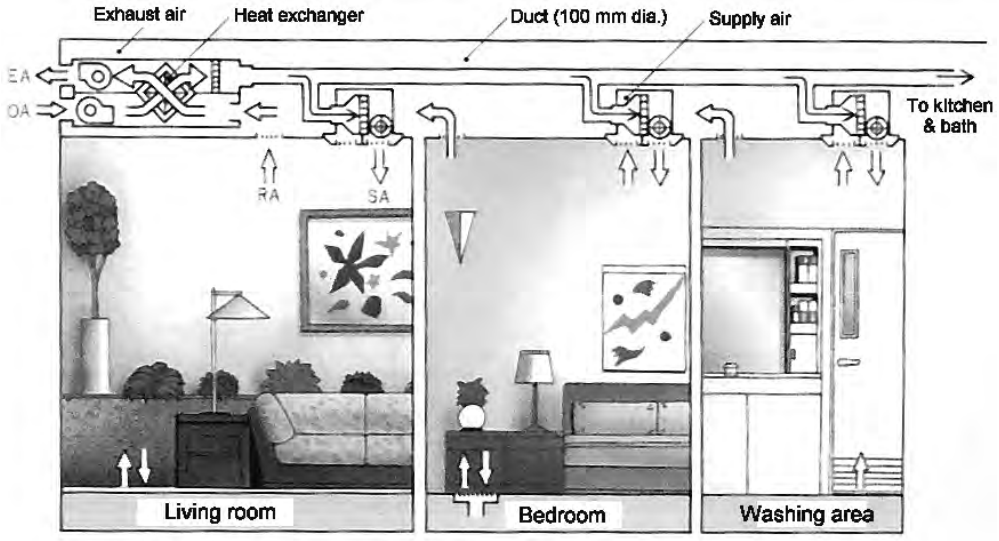
Hygiene Facilities:

Water supply (reclaimed water, pressure feed)

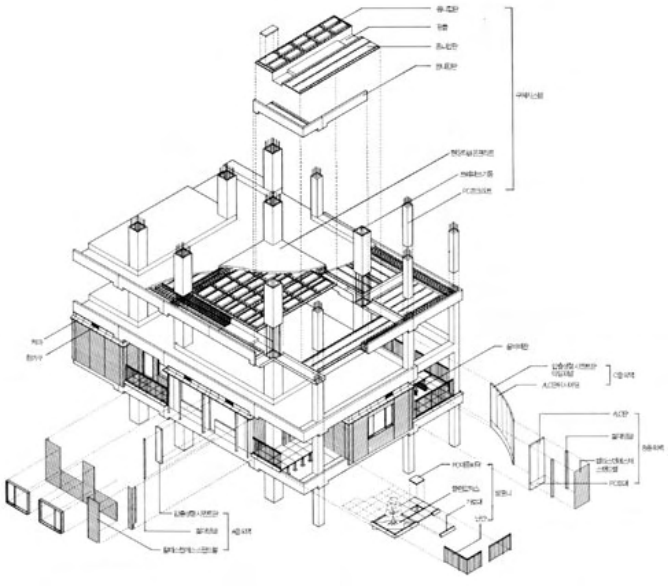
Wastewater (natural flow down, partial pressure feed)



Structural Grid

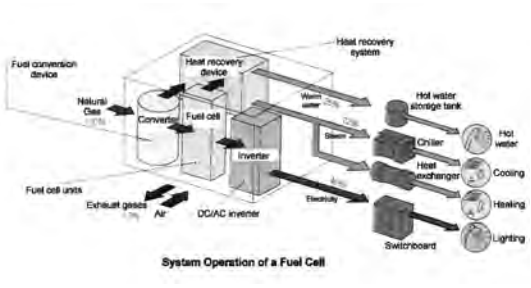


Air-conditioning System



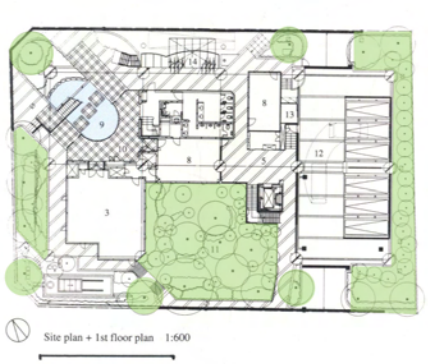
Electrical Facilities:

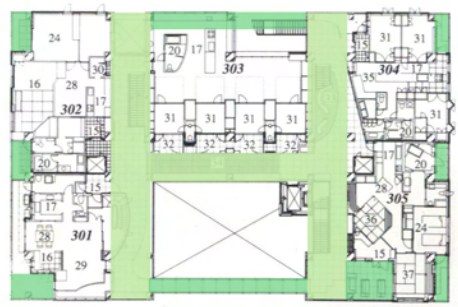
Power supply: 100kW fuel cell, 7.5 kW solar cells, storage cells
Distribution: DC power supply, Flexible Piping system



Green Space and Gardens:

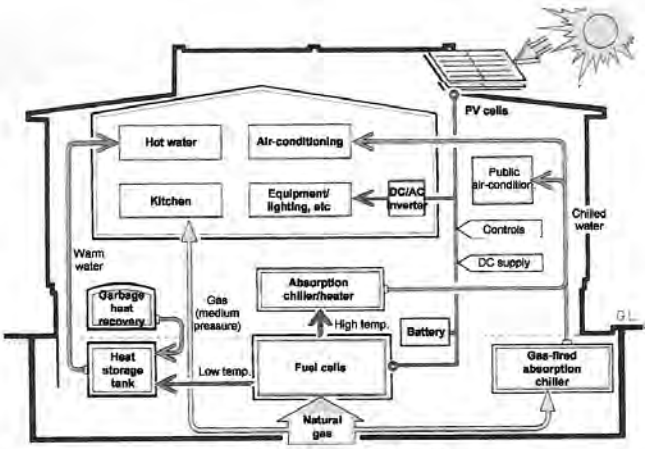
Ecological Biosystem
Gardening and Roof Gardens



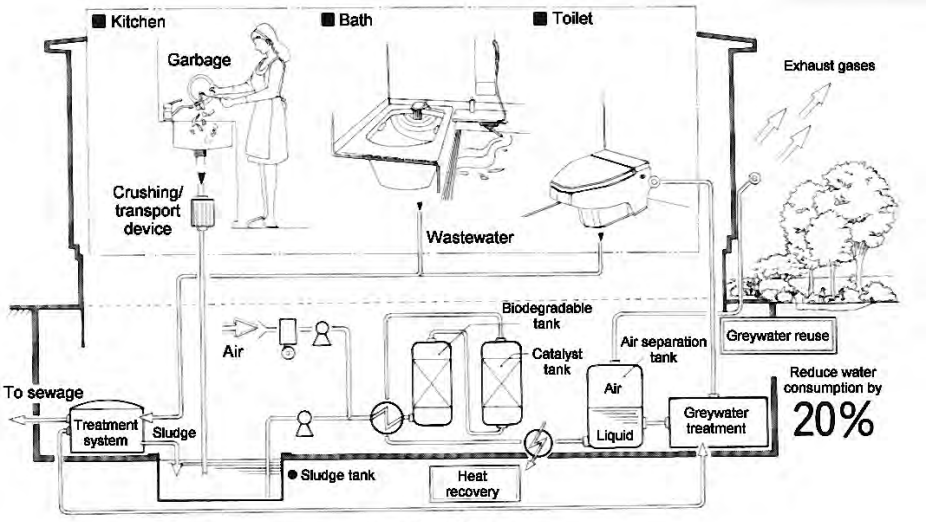


Garbage and Waste:

Garbage Treatment: aqua loop system (catalytic wet oxidation process)
Wastewater/waste fluids: garbage treatment



Effective use of fuel cell energy and waste energy



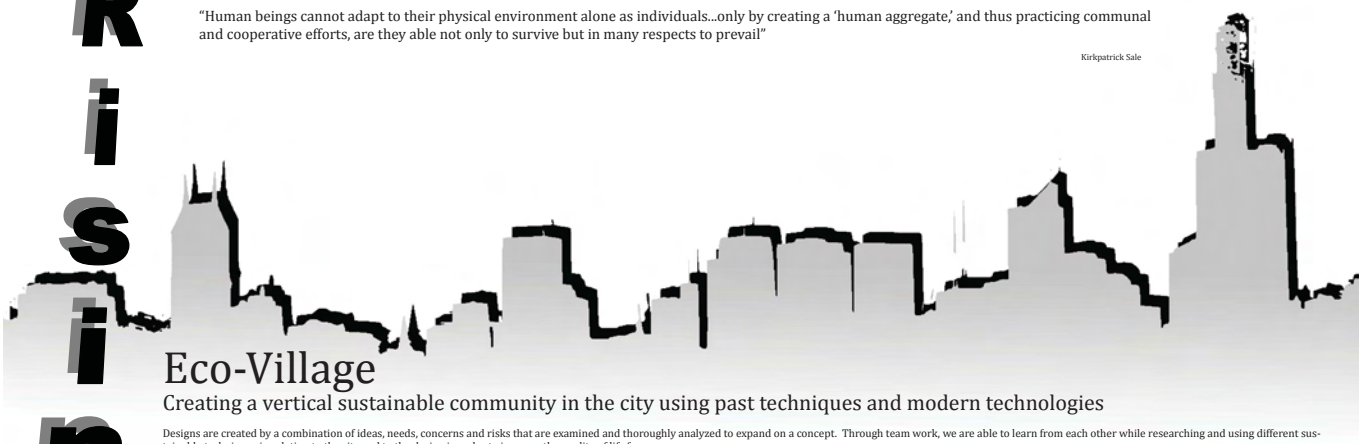
Aqua Loop System

Appendix VII: Thesis Prep Poster

Rising

"Human beings cannot adapt to their physical environment alone as individuals...only by creating a 'human aggregate,' and thus practicing communal and cooperative efforts, are they able not only to survive but in many respects to prevail"

Kirkpatrick Sale



Eco-Village

Creating a vertical sustainable community in the city using past techniques and modern technologies

Designs are created by a combination of ideas, needs, concerns and risks that are examined and thoroughly analyzed to expand on a concept. Through team work, we are able to learn from each other while researching and using different sustainable techniques in relation to the site and to the design in order to improve the quality of life for everyone.

Without the modern techniques and technical knowledge that we have today, all of our ancestors were able to use their sites and work with their landscapes to survive, to provide shelter and to feed their families. Creating a community that depends on itself while giving back to the surrounding communities would be ideal. Designs of this matter need to be personalized so that they facilitate convenience and provide the community with the most benefits by using sustainable techniques and new technologies.

My thesis will investigate the possibilities of designing a vertical eco-village that uses sustainable techniques and new technologies to survive. Many horizontal eco-villages currently are flourishing throughout our world on all scales. Sustainable vertical communities can find a way to succeed using a smaller piece of land, moving closer to the city center and creating a place that can be enjoyed by the whole community.

This project will be located in the city, which will allow most of the public amenities to be accessed within walking distance and, therefore do not need to be included in the program. There will be two neighborhoods of 12 houses; each house will consist of major necessities as well as a garden and outdoor yard. There will also be communal gathering spaces, rooms, gardens and outdoor spaces around the site. These houses will be completely sustainable to produce enough energy for themselves while contributing to the quality of the city.

Public Space

Public Spaces could be used by the community members and residents. At the street level could be a space that is constructed as a pedestrian pass-through or within which one could sit down to relax. The site should include a transportation hub, a community center, a market space and parking. The transportation hub should cluster all the means of transportation to allow the users to easily travel from one place to another. The community center, a large open area for about 100 people, could be used or rented by anyone in the city, allowing the space to be used for many different functions. Six market spaces would be located on the site for local artists and entrepreneurs to sell their products and goods. Also communal gardens could use this space for a farmers market to sell products to city residents. Parking is always a challenge in a city, but basement parking would seem to work well, especially for the employees and inhabitants

Eco-Village Ithica, New York

3 Neighborhoods with 30 families each
- sustainable, farming and a large plot of land

Housing

Housing would make up more than 50% of the site and consist of two, three and four bedroom houses. Houses would have a living room, dining room, kitchen, laundry room and at least one and half baths with 100 sqft of garden space and 100 sqft of outdoor space per bedroom. Two bedroom units would be 1,200 sqft; with the outdoor space and garden, the size would increase to 1,600 sqft. Three bedroom units would be 1,400 sqft with a total of 2,000 sqft, and four bedroom units would be 1,700 sqft with a total of 2,500 sqft. Houses would be totally sustainable with tanks to capture rainwater used to water garden, vertical gardens to save space, and large freezers to store foods for the winter. The users should have no extra fees besides the purchase of the house. Communal help would be expected.

Vertical Wall Gardens

Old gutters stacked on top of each other to make a vertical garden on the side of a house

Planters built into the side of the house vertically

Landscape

Landscape elements would mostly occupy the open space that would be present on the street level. Approximately half the site would be open for the ability to create a public park which would be accessible to any passerby. A large pond would be created to allow for fishing and skating during the different seasons of the year. Another aspect that should be considered at the site is waste and water management. Ponds and swells would have to be created to carry and filter water before reusing the water in the building.

Outdoor Scenes

Outdoor patio with planters and seating

Ponds, Swells and Gardens

Public Space	Program Area	Units	Total Area (S.F)
Transportation Hub	100 sqft	1	100 sqft
Community Center	1,500 sqft (100 People)	1	1,500 sqft
Market Space	80 sqft	6	480 sqft
Parking	200 sqft	12	2,400 sqft
		Total Net: 4,480 (1.3 sqft)	Total Gross: 5,824

Administration	Program Area	Units	Total Area (S.F)
Lobby	400 sqft	1	400 sqft
Housing Office	100 sqft	3	300 sqft
Farming Office	100 sqft	2	200 sqft
Sustainable Office	100 sqft	2	200 sqft
		Total Net: 1,100 (1.3 sqft)	Total Gross: 1,430

Housing	Program Area	Units	Total Area (S.F)
Two Bedroom	1,600 sqft	8	12,800 sqft
Three Bedroom	2,000 sqft	8	16,000 sqft
Four Bedroom	2,500 sqft	8	20,000 sqft
Storage/Staff	500 sqft	2	1,000 sqft
		Total Net: 49,800 (1.3 sqft)	Total Gross: 64,740

Farming	Program Area	Units	Total Area (S.F)
Fruit/Berry Trees	2,000 sqft	1	2,000 sqft
Dairy/Poultry	2,000 sqft	1	2,000 sqft
Communal Garden	3,000 sqft	1	3,000 sqft
Medicinal/Herb	1,000 sqft	1	1,000 sqft
		Total Net: 8,000 (1.3 sqft)	Total Gross: 10,400

Landscape	Program Area	Units	Total Area (S.F)
Swells/Grasses	50 sqft	6	300 sqft
Public Park	3,000 sqft	1	3,000 sqft
Pond (fish or skate)	1,000 sqft	1	1,000 sqft
		Total Net: 4,300 (1.3 sqft)	Total Gross: 5,590

Services	Program Area	Units	Total Area (S.F)
Water Storage	1,500 sqft	1	1,500 sqft
Storage Space	500 sqft	1	500 sqft
Loading Dock	1,000 sqft	1	1,000 sqft
Wind and Solar	800 sqft	1	800 sqft
Mechanical Space	1,500 sqft	1	1,500 sqft
		Total Net: 5,300 (1.3 sqft)	Total Gross: 6,890

Total Gross (sqft): 93,574 sqft

Alberto Kalach, Mexico City

The techniques on unused and abandoned sites in the city

Oregon Sustainability Center

Proposed Living building for Portland, to house sustainable businesses

Administration

Administration offices are for marketing and employees. The housing offices, farming offices and the offices used for sustainable purposes could have one joint lobby that would provide a waiting area as well as display information about the construction and goals of the project. The housing offices would facilitate rentals or purchases. The Farming office would support the communal gardens and farmers market. The offices focused on sustainability will manage the equipment and give tours to interested parties.

Vertical Farming Designs

Multiple concepts created by Dickson Despommiern from Colombia Un.

Farming

Beside the garden spaces within the individual houses, there would be larger communal gardens throughout the site. These areas would be used more for farming, specifically berries and trees, dairy and poultry, medicinal plants and communal vegetable and plant gardens. These gardens could have an assortment of plant life allowing the clients to grow and tend to what they need and like. Though people would be hired to take care of the communal gardens, it would be expected that the users could come and go as they please to help and care for the gardens and food.

Sustainable Techniques

Natural watering systems and planters outside of the windows for convenience

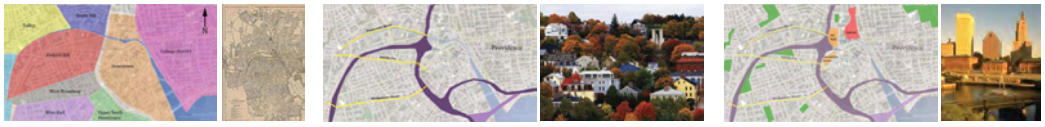
Wind and Solar power are used to generate energy

Services

Services would be another aspect of the project that could be located below grade besides the loading dock which would be used for deliveries. A location for water storage, storage space and mechanical space could be located together in a cool space without the need of windows. Wind and solar power could be used throughout the project where the advantages of the wind and sun would be successful.

Sites:

Providence, RI



Promenade Street

History

Boarders both the historic district of Smith Hill and valley district; Promenade Street is the edge of the boundary next to the River

During the 19th and 20th century the district became densely populated since the river provided power for the industrial mills

The Districts consists of mostly smaller historic homes; most of the inhabitants are white Europeans and also some minorities

One large tower in the district sets the stage for the city since the structure operates the trains and equipment for the city

Current

** Masterplan of neighborhood already completed
** River can provide energy and a place to relax
** Connects straight to Providence Place Mall and Amtrak station

Offices and Medical Buildings
Housing and renovated mill buildings
Restaurants, Cafes and Shops
Abandoned / Unused Mill buildings and Sites
Schools

Walkscore.com **91** out of 100

Atwell Avenue

History

High end street in Federal Hill, which is known for its Italian community with high end restaurants, shops and plenty of night life

Named for Amos Maine Atwell, businessman who was first to develop on the western side of the city

During the 19th century the Federal Hill developed into a working class area partly because of the commercial shipping

Acutal "Gateway" into the city that includes many famous public amenities

Current

** Cultural centerpiece of Federal Hill (Italian heritage)
** Many famous Restaurants and a mixture of other urban businesses
** Lots of activity during both the day and the night

Many different Restaurants (sandwich, pizza, fine dining)
Convenience Stores
Local Businesses
Night Clubs and Tattoo parlors
Housing

Walkscore.com **83** out of 100

Westminster Street

History

The street is on the boarder of Federal Hill and the West End of Providence known as the West Broadway neighborhood

Before the 1800's the land was mostly used as farming and later during the 1880's the land was used for recreational activities and parks

After the world wars wealthy Italo-Americans started moving into the neighborhood

In 1865, the first street car from the city made it into the neighborhood using Westminster Street

Current

** Part of West Broadway neighborhood (part of Federal Hill)
** Bordering the city of Providence
** Continues straight into the city while also continuing to the west

Offices and local Stores
Convenience Stores
Restaurants
Shops
Housing and School

Walkscore.com **88** out of 100

Portland, Maine

_ On waterfront with new urban design movements
_ Many historic brick buildings
_ Colder winters - cleaner waters!
_ Smaller city, almost only city in Maine
_ Huge trading port in the past and still is today

New Haven, Connecticut

_ On the water, lots of history
_ Brick historic city
_ Abundant trees and parks
_ Lively atmosphere

ARCH 641: Fall 2009
Thesis Proposal

Professor J. Bonder

Erica Wiggin

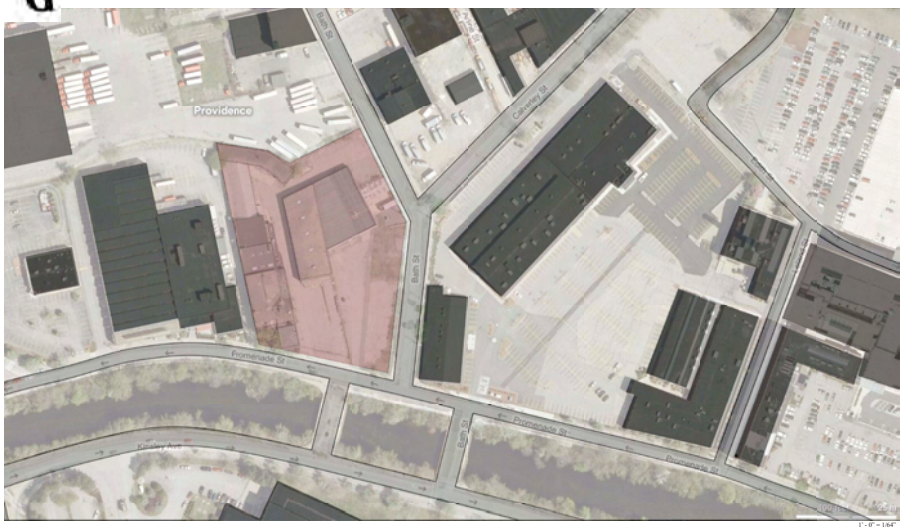
Appendix VIII: Schematic Design Review

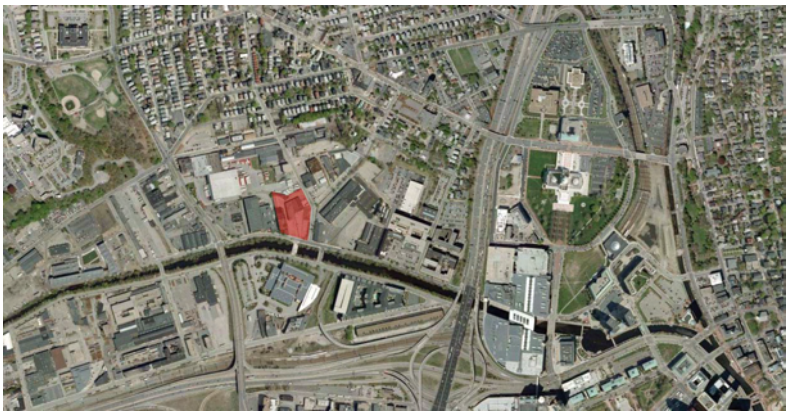
RISING

Residence

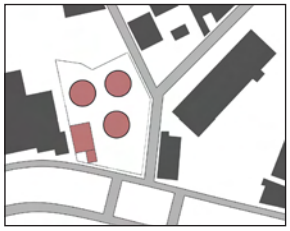
A vertical sustainable community in the city that produces, teaches and thrives using past techniques, modern technologies and natural resources.

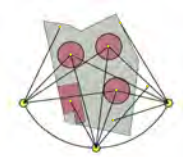
Erica M. Wiggin

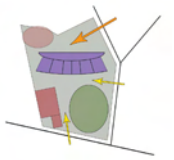




TOWER





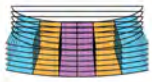


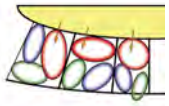
1 TOWER

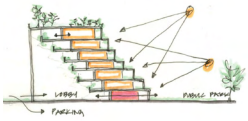
- ONE STORY UNITS
- 6 UNITS TO A LEVEL

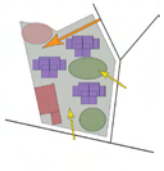
- MORE OPEN SPACE
- LOTS OF SUN
- VERTICAL CIRCULATION?
- BASIC LAYOUT

- PUBLIC SPACE
- PROGRAM / EXISTING
- HOUSING
- 4 BEDROOM UNITS
- 3 BEDROOM UNITS
- 2 BEDROOM UNITS
- CIRCULATION / STREET
- KITCHEN / LIVING / DINING
- BEDROOMS
- OUTDOOR SPACE & GARDENS







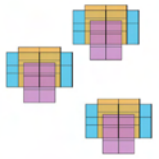


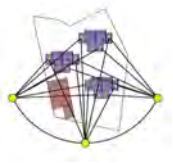
3 TOWERS

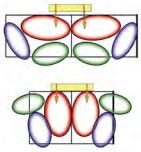
- ONE STORY UNITS
- 2 UNITS TO A LEVEL
- 3 TOWERS WITH 12 UNITS

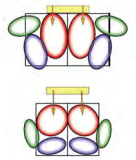
- DIFFERENT OPEN SPACES
- LOTS OF SUN
- VERTICAL CIRCULATION?
- GARDENS ON ROOFS

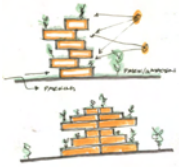
- PUBLIC SPACE
- PROGRAM / EXISTING
- HOUSING
- 4 BEDROOM UNITS
- 3 BEDROOM UNITS
- 2 BEDROOM UNITS
- CIRCULATION / STREET
- KITCHEN / LIVING / DINING
- BEDROOMS
- OUTDOOR SPACE & GARDENS

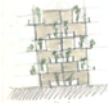




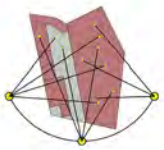


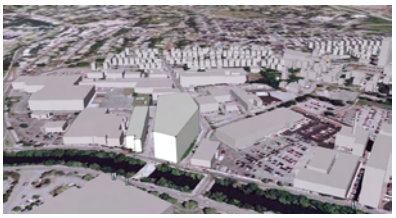


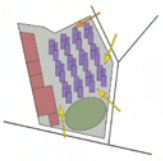




STREET





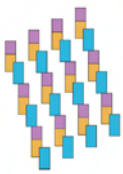


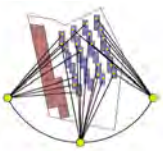
VERTICAL

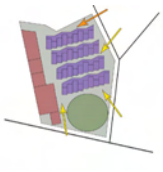
- THREE STORY UNITS
- RAISED PORCH / ENTRANCE
- 3 UNITS TO A PORCH
- 4 STREETS, 9 UNITS EACH

- MORE OPEN SPACE
- LOTS OF SUN
- PUBLIC / OPEN GROUND LEVEL
- LEADS WHERE? NOT EXISTING
- BASIC LAYOUT

- PUBLIC SPACE
- PROGRAM / EXISTING
- HOUSING
- 4 BEDROOM UNITS
- 3 BEDROOM UNITS
- 2 BEDROOM UNITS
- CIRCULATION / STREET
- KITCHEN / LIVING / DINING
- BEDROOMS
- OUTDOOR SPACE & GARDENS





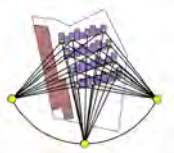


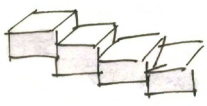
HORIZONTAL

- THREE STORY UNITS
- COMMON RAISED PORCH ENTRANCE
- 9 UNITS TO A STREETS
- 4 STREETS

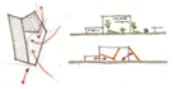
- MORE OPEN SPACE
- LOTS OF SUN
- PUBLIC / OPEN GROUND LEVEL
- BASIC LAYOUT

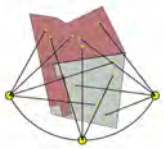
- PUBLIC SPACE
- PROGRAM / EXISTING
- HOUSING
- 4 BEDROOM UNITS
- 3 BEDROOM UNITS
- 2 BEDROOM UNITS
- CIRCULATION / STREET
- KITCHEN / LIVING / DINING
- BEDROOMS
- OUTDOOR SPACE & GARDENS

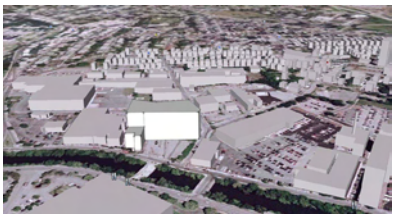




BACK





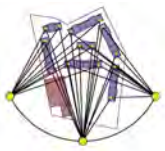


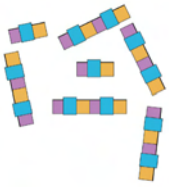
EDGE

- THREE STORY UNITS
- ENTRANCE ON GROUND LEVEL
- ROOF GARDENS

- DIFFERENT OPEN SPACES
- SMALLER SPACES
- PATHWAYS ON SITE
- BASIC LAYOUT

PUBLIC SPACE
PROGRAM / EXISTING
HOUSING
4 BEDROOM UNITS
3 BEDROOM UNITS
2 BEDROOM UNITS
CIRCULATION / STREET
KITCHEN / LIVING / DINING
BEDROOMS
OUTDOOR SPACE & GARDENS



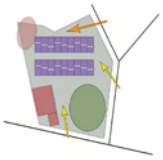


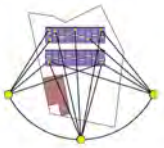
BARS

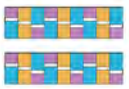
- THREE STORY UNITS
- 10 UNITS TO A BAR
- 2 BARS WITH UNITS ON SIDES
- GROUND FLOOR PUBLIC

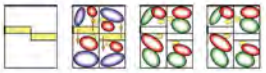
- MORE OPEN SPACE
- LIMITED SUN TO SOME
- VERTICAL CIRCULATION?
- BASIC LAYOUT

PUBLIC SPACE
PROGRAM / EXISTING
HOUSING
4 BEDROOM UNITS
3 BEDROOM UNITS
2 BEDROOM UNITS
CIRCULATION / STREET
KITCHEN / LIVING / DINING
BEDROOMS
OUTDOOR SPACE & GARDENS









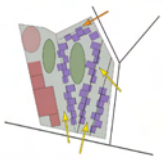
TWO STREETS

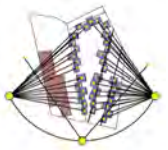
COURTYARD

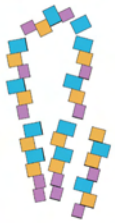
- THREE STORY UNITS
- GROUND LEVEL ENTRANCES
- COMMON GREEN FOR UNITS

- NO PUBLIC GREEN SPACE
- LOTS OF SUN
- LOOP AROUND UNITS
- BASIC LAYOUT

PUBLIC SPACE
PROGRAM / EXISTING
HOUSING
4 BEDROOM UNITS
3 BEDROOM UNITS
2 BEDROOM UNITS
CIRCULATION / STREET
KITCHEN / LIVING / DINING
BEDROOMS
OUTDOOR SPACE & GARDENS





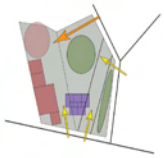


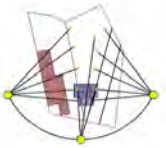
STACKABLE

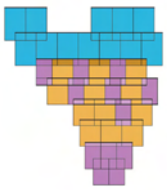
- ONE STORY UNITS
- DIFFERENT UNITS TO A LEVEL
- COMMON STREET

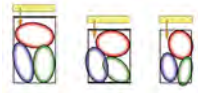
- NO OPEN OR OUTDOOR SPACE
- LIMITED SUN ANGLES
- VERTICAL CIRCULATION?
- WHAT HAPPENS UNDER?

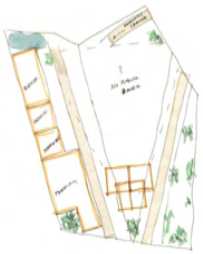
PUBLIC SPACE
PROGRAM / EXISTING
HOUSING
4 BEDROOM UNITS
3 BEDROOM UNITS
2 BEDROOM UNITS
CIRCULATION / STREET
KITCHEN / LIVING / DINING
BEDROOMS
OUTDOOR SPACE & GARDENS





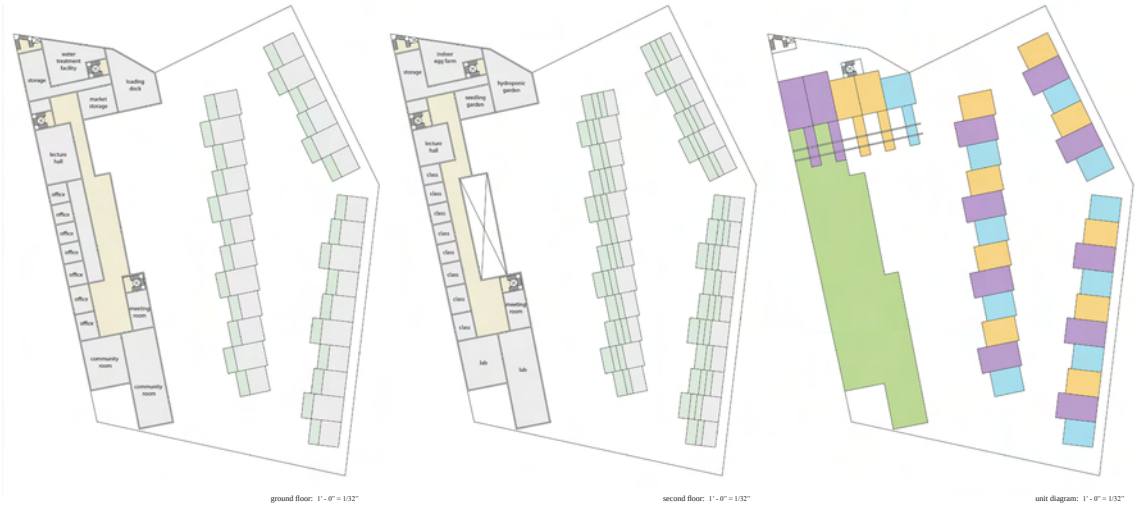






Appendix IX: Mid-Term Review

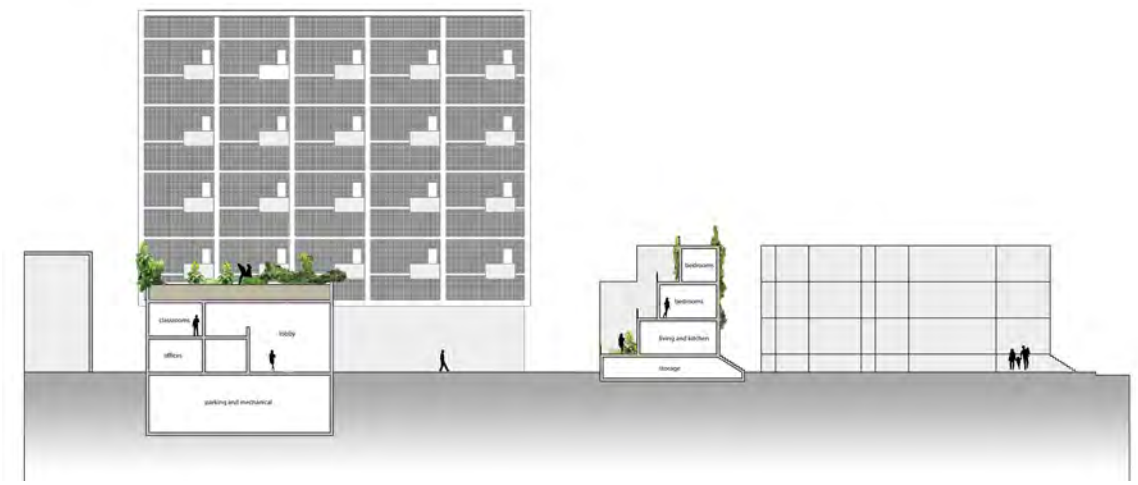
site plan: 1' - 0" = 1/64"



ground floor: 1' - 0" = 1/32"

second floor: 1' - 0" = 1/32"

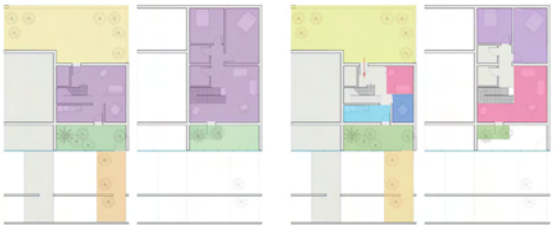
unit diagram: 1' - 0" = 1/32"

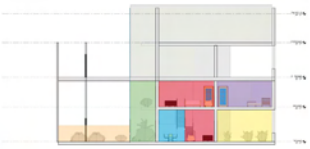


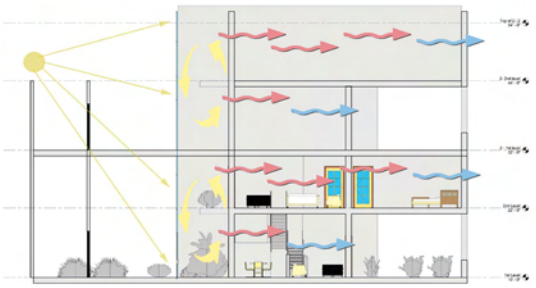
site section: 1' - 0" = 3/32"

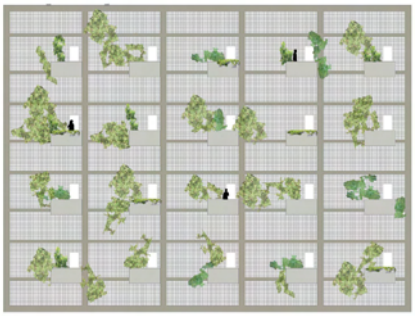
Tower Unit

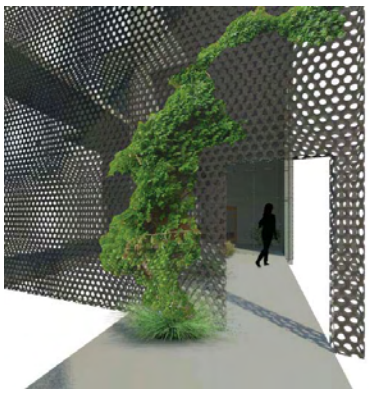
_ two floor units
_ sun room - garden area
_ wheel chair accessibility
_ large open floor plan

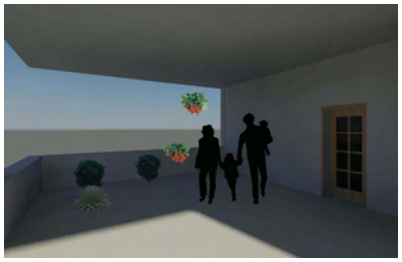


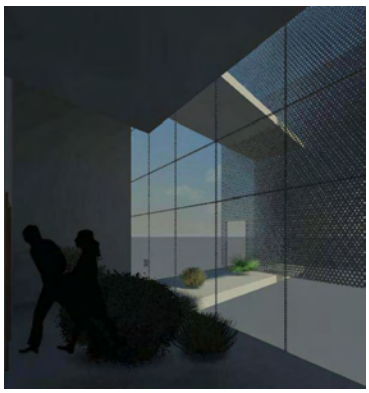






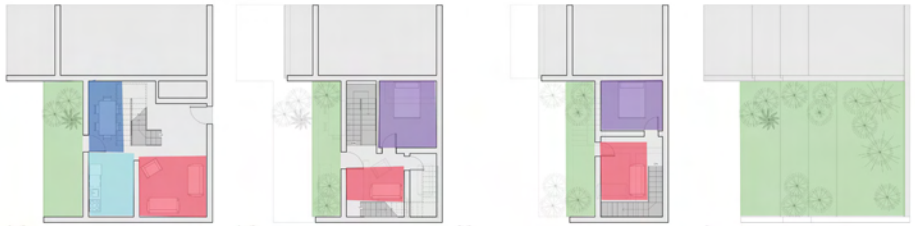


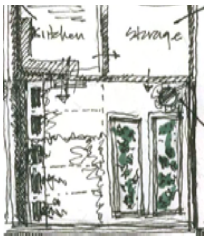




Townhouse

_ three story units
_ raised 6 feet
_ roof access - garden
_ outdoor space on all floors





Appendix X: Gate Review

RISING

Residence

A vertical sustainable community in the city that produces, teaches and thrives using past techniques, modern technologies and natural resources.

Erica M. Wiggin

Without the modern techniques and technical knowledge that we have today, all of our ancestors were able to use their sites and work with their landscapes to survive, to provide shelter and to feed their families. A modern community that depends on itself while giving back to the surrounding communities would be ideal. Designs need to be personalized so that they facilitate convenience and provide the community with the most benefits.

My thesis will investigate the possibilities of designing a vertical eco-village that uses sustainable techniques and new technologies to survive. Many horizontal eco-villages currently are flourishing throughout our world on all scales. Vertical eco-villages can find a way to succeed using a smaller piece of land, moving closer to the city center and creating a place that can be enjoyed by the whole community. Many parts of my project are based off of the standards of Eco-Village Ithaca, which contains three neighborhoods of 30 units but owns a massive amount of land. This allows them to spread and become bigger during the years, but is there a way to contain the sprawl?

Many cities would be desirable for this type of project, but Providence seems to be an ideal city to work with since the connection between the western districts needs to be stronger with the city center. Each house or unit will consist of major living necessities as well as a garden and outdoor yard. There will also be communal gathering spaces, gardens and outdoor spaces around the site. These houses will be completely sustainable to produce enough energy and food for themselves while contributing to the quality of the city.

My site has an exisitng two story building on the west side of the site that houses all the public ammentities, farming and educational neccessities. Along the exisitng building, a pedestrian street was formed and connects to the minor streets that lead to the rowhouses. My project consists of three neighborhoods of triple decker units, which contain their own garden outside of their kitchen and also on the third floor. The units contain parking spaces next to the front door or each unit. In the back left corner of my site is where the tower is located that also contians housing units for families or individuals that enjoy gardening and cooking.

Site Perspective - from Pedestrian Bridge

Eco -Village Ithaca / Providence Site - land use

Eco -Village Ithaca / Providence Site - housing

Site Perspective - from Bath Street

Promenade Ave Site Context

Public Space	Program Area	Units	Total Area (sqft)
Community Garden	1,000 sqft	1	1,000 sqft
Community Center	5,000 sqft	(100 People)	5,000 sqft
Market Space	400 sqft	1	400 sqft
Pavilion	400 sqft	1	400 sqft
		Total Nos: 4,100	(1.5 sqft) Total Gross: 5,875

Administrative	Program Area	Units	Total Area (sqft)
Meeting Office	150 sqft	1	150 sqft
Farming Office	150 sqft	1	150 sqft
Community Office	1050 sqft	1	1050 sqft
		Total Nos: 1,350	(1.5 sqft) Total Gross: 1,950

Housing	Program Area	Units	Total Area (sqft)
Open Bedrooms	1,000 × 800 = 1,000 sqft	10	10,000 sqft
Closed Bedrooms	1,000 × 800 = 1,000 sqft	10	10,000 sqft
Living Room	1,000 × 800 = 1,000 sqft	10	10,000 sqft
Stairs and Hall	800 sqft	10	8,000 sqft
		Total Nos: 70,500	(1.5 sqft) Total Gross: 97,250

Farming	Program Area	Units	Total Area (sqft)
Fruit/Berry Trees	2,000 sqft	1	2,000 sqft
Vegetables	2,000 sqft	1	2,000 sqft
Compost/Herb Gardens	2,000 sqft	1	2,000 sqft
Mushroom Bank	2,000 sqft	1	2,000 sqft
		Total Nos: 8,000	(1.5 sqft) Total Gross: 11,000

Landscape	Program Area	Units	Total Area (sqft)
Public Trees	1,000 sqft	1	1,000 sqft
Public Park	3,000 sqft	1	3,000 sqft
Pond (Fish or shells)	2,000 sqft	1	2,000 sqft
		Total Nos: 6,000	(1.5 sqft) Total Gross: 9,000

Services	Program Area	Units	Total Area (sqft)
Water Tank	1,000 sqft	1	1,000 sqft
Storage Space	500 sqft	1	500 sqft
Loading Dock	1,000 sqft	1	1,000 sqft
Parking Space	2,000 sqft	1	2,000 sqft
Mechanical Space	800 sqft	1	800 sqft
		Total Nos: 5,300	(1.5 sqft) Total Gross: 8,000

Education	Program Area	Units	Total Area (sqft)
Storage/Planning	600 sqft	1	600 sqft
Exhibit Space	600 sqft	1	600 sqft
Lecture Hall	600 sqft	1	600 sqft
Lecture Hall	1,000 sqft	1	1,000 sqft
		Total Nos: 2,800	(1.5 sqft) Total Gross: 4,200

Total Gross (sqft): **130, 000**

Program (not 100% updated)

Program Relationships

location

commercial vs. residential

circulation

Existing Building

Figure Ground

Public Pedestrian Streets

Site Approach

Paths and circulation

Placement on Site

Garden / House Relationship

Garden Patio Sketch

Garden Elevation Sketch

Site Photo - From front corner

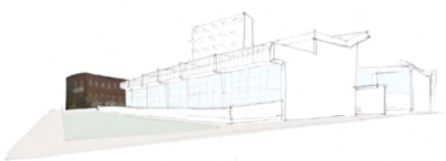
Intial Collage of

Existing Building

View of Downtown from Pedestrian Bridge

Site Plan : 1/64"

Site Sketch with Context

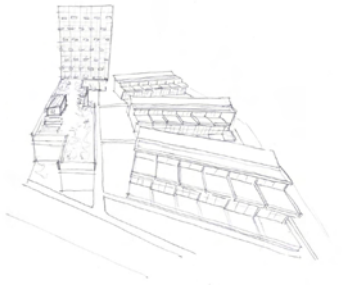


Perspective taken from the front corner of site

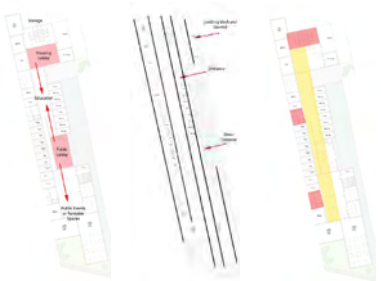
Ground Floor Plan : 1/32"

Second Floor of Existing Building : 1/32"

Roof Plan of Existing Building : 1/32"



Perspective taken from the South



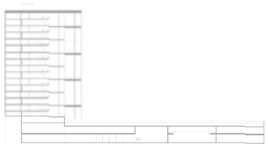
Program Seperation

Structure and Main Entrances

Egress and Main Hallway

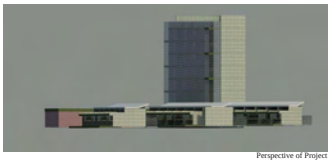
Perspective : Approaching from Promenade Street

Nexus Housing in Japan - Rem Koolhaas



Section through the tower and existing building

Wood Facade Detail



Perspective of Project

Perspective from large green space approaching the existing building

Triple Decker Details

East Elevation

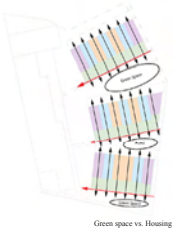
North Elevation

Row House

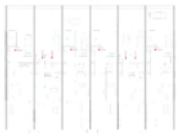
16	**Two Bedrooms** (blue)	=	32 Beds
6	**Three Bedrooms** (orange)	=	18 Beds
6	**Four Bedrooms** (purple)	=	24 Beds

Total: **28 Units** and **74 Bedrooms**

Sun and Unit Layout


Green space vs. Housing

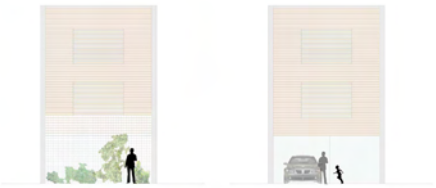
Layout of Units


Structure and Main Entrances

Typical Ground Floor Plan


South Elevation

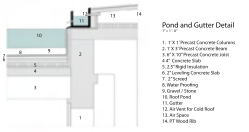

North Elevation of Row Houses


Study Elevations of Row Houses

Typical Second Floor Plan

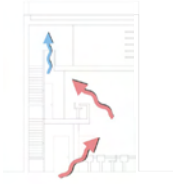

Section


Section



Roof Pond Detail

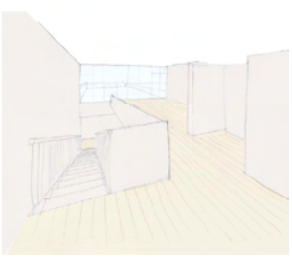
Typical Third Floor Plan

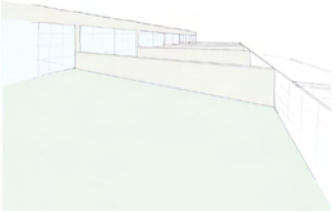



Section


View into Kitchen


View into Dining and Living


View from Third Floor to ourside Balcony

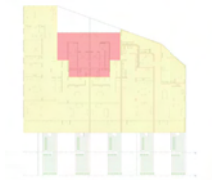

View from Balcony on third floor

Tower

1	**1 Bedrooom** (red)	x 8 =	8 Units, 8 beds
2	**Two Bedrooms** (blue)	x 8 =	16 Units, 48 beds
2	**Four Bedrooms** (purple)	x 8 =	16 Units. 64 beds
Total:	**40 Units**	and	**120 Bedrooms**

Tower Layout

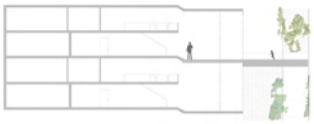
Structure and Main Entrances



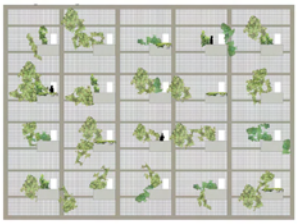
Program Organization

Program Organization (section)

Typical First Floor Plan



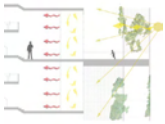
Section



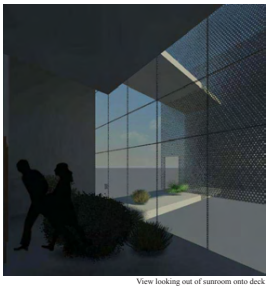
Studiy of Tower Elevation (not updated)

Elevation (not updated)

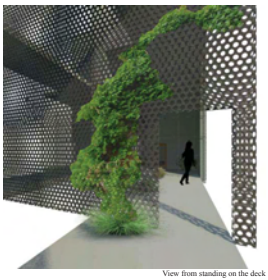
Typical Second Floor Plan



Sun and Screen Rotation Study

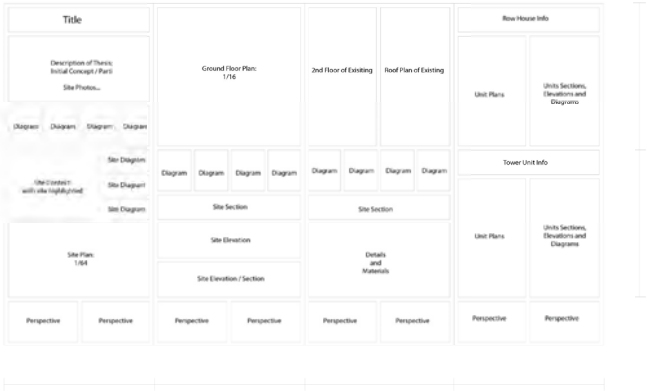


View looking out of sunroom onto deck



View from standing on the deck

Section through existing and tower (not updated)



Layout

Appendix XI: Final Review

THESIS

Designs are created by a combination of ideas, needs, concerns and risks that are examined and analyzed to expand on a concept. Through team work, we are able to learn while researching and using different sustainable techniques in relation to the site and to the design in order to improve the quality of life for everyone.

Without the modern techniques and technical knowledge that we have today, all of our ancestors were able to use their sites and work with their landscapes to survive, to provide shelter and to feed their families. A modern community that depends on itself while giving back to the surrounding communities would be ideal. Designs need to be personalized so that they facilitate convenience and provide the community with the most benefits.

Many horizontal eco-villages currently flourish throughout our world on all scales in various climates. My thesis will investigate the possibilities of designing a vertical society of a couple neighborhoods that use sustainable techniques and new technologies to survive. These sustainable communities should be able to find a way to succeed using a smaller piece of land, moving closer to the city center and creating a place that can be enjoyed by the whole community.

Many cities have experienced shrinkage in their city centers, leaving behind abandoned lots and buildings throughout the city streets. By creating a vertical community that works together to live sustainably by producing necessities such as electricity, clean water, food and medicine. The inhabitants will be contributing to the quality of the city as well as improving their lives by teaching, learning and developing new means of living.

PROPOSAL

My thesis is to design an eco-village that survives and depends on past techniques but also uses sustainable methods and new technologies. A hypothetical 50 families who live in their own homes but work the land together would facilitate better communication and relationships. Enhancing the practical considerations would be an analysis of the day-to-day functions of several families to demonstrate the relationships and interactions necessary for success. There are hundreds of examples of these horizontal sustainable communities that might find a way to succeed using a smaller piece of land, moving closer to the city center and creating a place that can be enjoyed by the whole community.

Many cities have been victim to foreclosure and are now experiencing shrinkage in their city populations. Using a plot of land in the middle of nowhere does nothing to facilitate community connection to a larger more reliable city. Being able to revive a small city neighborhood that has been damaged and forgotten can give the depleted city new hope.

These communities should be located near larger cities or even within a city for convenience and the ability to connect to public transportation systems and basic necessities. Eco-villages usually require substantial pieces of land that are not readily available in cities; at the same time, creating a vertical eco-village in any location would be a challenge. The aspects of the eco-village would be examined and reorganized in order to create a successful vertical village with all the necessities and attributes that are found in a working village. The eco-community would be designed based on the needs, wants and necessities of the everyday individual.

PROGRAM

Developing a sustainable eco-village in the city would be the challenge, keeping the client and user in mind. The city would be the client and allowing the street level to be more of a public amenity could permit the architecture to give back to the surrounding community. Limiting construction to half the site would leave more open public space and would provide the residents with more sunlight which could otherwise be overshadowed by tall buildings. The housing units would contain two or more bedrooms, allowing families and students to live together within the complex. The inhabitants would have to practice sustainable techniques and would be expected to practice organic farming and participate in community affairs.

Based on family needs and sustainable attributes, a program would be created to give the inhabitants everything to be found in a succesful vertical community in the city. The proposed program would total, in the beginning, around 130,000 gross square feet (Program Table) and would be split into seven categories: Public Space, Administration, Housing, Farming, Landscape, Educational Space and Services. These programmatic spaces would be organized and arranged to create the most succesful social relationships and interactions while still creating the most efficient spaces for the user to enjoy.

The project has grown much larger to house almost 70 to 80 families ranging between one bedrooms and four and totally over 300,000 square feet.


Program (not updated)

SITE

Providence, Rhode Island seems to have a thriving and developing city center, especially since the highway project started. On the western side of I 95, there are some strips of land with great historical importance that cry for redevelopment. Known as Federal Hill and the Promenade District, these areas need a real connection with the city center of Providence.

Promenade Street borders both the historic district of Smith Hill and the Valley District and is known for the river that runs along the historic street. Between the 19th and 20th centuries, the district became well populated since the river provided power for the industrial mills. The Promenade district consists of mostly smaller historic homes which are inhabited by a majority of white Europeans and some minorities. One large tower on Promenade Street is the foundation of the city since the structure operates the trains and equipment for the city.

The river has been used to produce energy in the past and can still do that while creating a place for leisure. Promenade Street connects directly with Providence Place Mall and the Amtrak Station while curving around on the other end towards Westminster. Currently the street is filled with old mill buildings, some renovated and other abandoned. Some of the mills have been converted to housing but other parts of street include practices, medical office, restaurants, cafes, shops and even a school. The site is currently abandoned with two existing building on it and lots of wild vegetation.


Location


River


Promenade Ave


Circulation


Promenade Ave and Main Street


Commercial vs. Residential


Massing


Eco - Village Ithaca - 3 Neighborhoods of 30 homes


Eco -Village Ithaca / Providence Site - land use

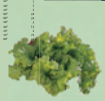

Eco -Village Ithaca / Providence Site - housing

GARDENS

Beside the garden spaces within the individual houses, there would be larger communal gardens throughout the site. These areas would be used for larger scale farming, specifically berries and trees, dairy and poultry, medicinal plants and communal vegetable and plant gardens. These large gardens could have an assortment of plant life allowing the clients to grow and tend to what they need and like. Though people would be hired to take care of the communal gardens, it would be expected that the users would come and go as they pleased to help care for the gardens and food. Also composting and storage are critical urban farming.

Houses would have a living room, dining room, kitchen, laundry room and at least one and half baths with 100 sqft of garden space and 100 sqft of outdoor space per bedroom. Two bedroom units would be 1,200 sqft; with the outdoor space and garden, the size would increase to 1,600 sqft. Three bedroom units would be 1,400 sqft with a total of 2,000 sqft, and four bedroom units would be 1,700 sqft with a total of 2,500 sqft. Houses would be totally sustainable with tanks to capture rainwater used to water vertical gardens that would save space and with large freezers to store foods for the winter. The users would have no extra fee besides the purchase of the house. Communal help and cooperation would be expected.

Vegetables



Herbs

Edible Flowers

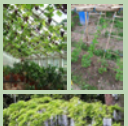
Fruits

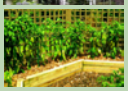
Nuts

Medicinal Plants

Container Gardening

Trellis / Vines





Wall Planter

Flower Bed

Hydroponics

Trees / Bushes

Window / Railing

Site Plan 1/64" = 1'-0"

Figure Ground

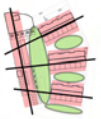
Site Approach

Concept

Program Seperation

Public Pedestrian Streets

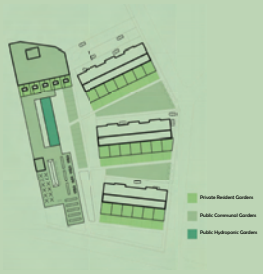
Paths and circulation

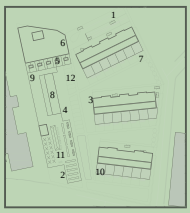


Concept with Green Space

Service and Movement

Section 1/16" = 1'-0"

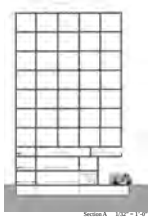




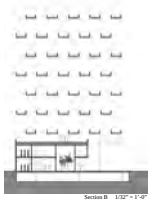
Ground Floor Plan 1/32" = 1'-0"

Second Floor Plan 1/32" = 1'-0" Third Floor Plan 1/32" = 1'-0" Basement Plan 1/32" = 1'-0"

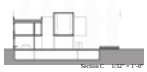
Program Seperation Structure and Main Entrances Egress and Main Hallway



Section A 1/32" = 1'-0"



Section B 1/32" = 1'-0"



Section C 1/32" = 1'-0"

Section D 1/32" = 1'-0"

Section F 1/16" = 1'-0"

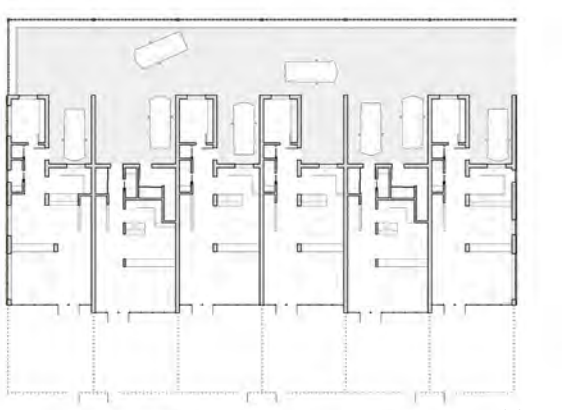
Section E 1/32" = 1'-0"

Row House

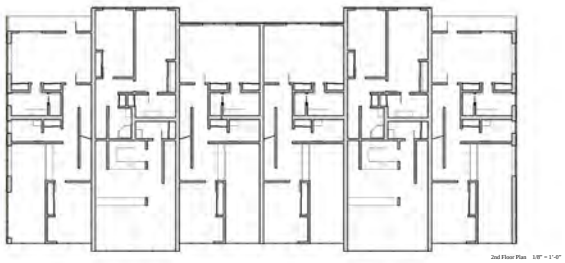
16	**Two Bedrooms** (blue)	=	32 Beds
6	**Three Bedrooms** (orange)	=	18 Beds
6	**Four Bedrooms** (purple)	=	24 Beds
Total:	**28 Units**	and	**74 Bedrooms**

Sun and Unit Layout

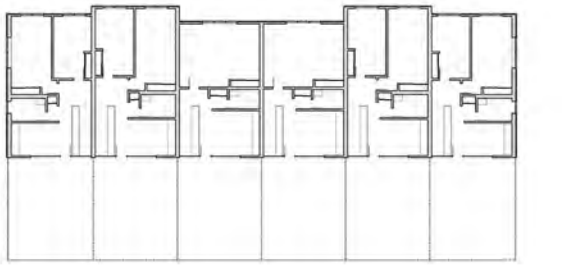
Green space vs. Housing



1st Floor Plan 1/8" = 1'-0"

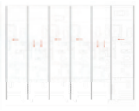


2nd Floor Plan 1/8" = 1'-0"

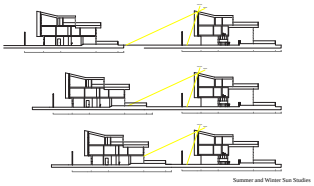


3rd Floor Plan 1/8" = 1'-0"

Layout of Units



Structure and Main Entrances



Summer and Winter Sun Studies

Row House Elevation 1/8" = 1'-0"

Row House Elevation 1/8" = 1'-0"

Row House Elevation 1/8" = 1'-0"

Row House Elevation 1/8" = 1'-0"

Section 1/8" = 1'-0"

Section A 1/8" = 1'-0"

Section B 1/8" = 1'-0"

Extreme Gardener

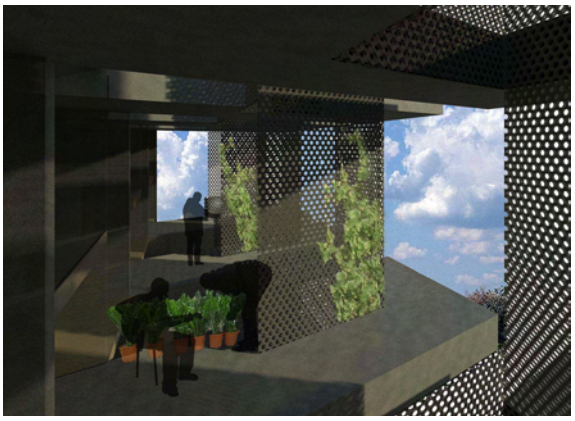
Casual Gardener Athletic Gardener Social Gardener New Gardener

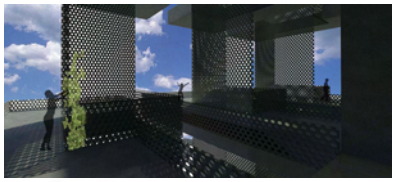
Tower

1	**1 Bedroom** (red)	x 8 =	8 Units, 8 beds
2	**Two Bedrooms** (blue)	x 8 =	16 Units, 48 beds
2	**Four Bedrooms** (purple)	x 8 =	16 Units, 64 beds
Total:	**40 Units**	and	**120 Bedrooms**

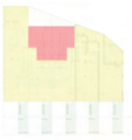
Tower Layout

Structure and Main Entrances



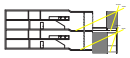


Tower Elevation

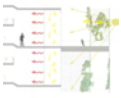


Program Organization

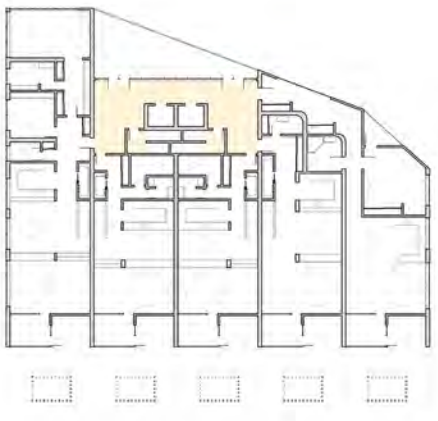
Program Organization (section)



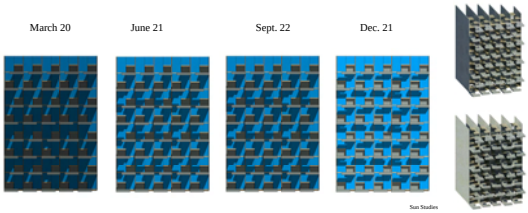
Summer and Winter Sun Studies



Sun and Screen Rotation Study

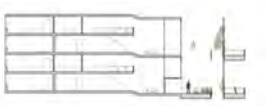


1st Floor Plan 1/8" = 1'-0"

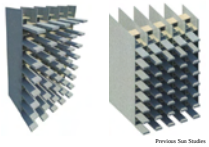


March 20 June 21 Sept. 22 Dec. 21

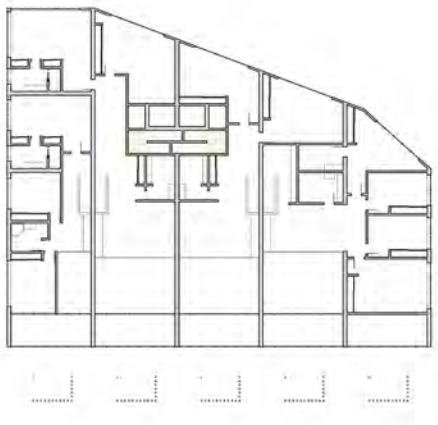
Sun Studies



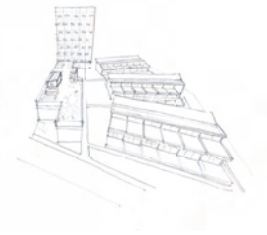
Section 1/8" = 1'-0"



Previous Sun Studies



2nd Floor Plan 1/8" = 1'-0"



Extreme Gardener

Casual Gardener Athletic Gardener Social Gardener New Gardener

Bibliography: Annotated

Alexander, Christopher et.al. A Pattern Language. Oxford Oxfordshire: Oxford University Press, 1977.

This small book is a practical guide on how the author felt that we should live. He deeply investigates the potential of every way of living in extensive detail. It was fun and quick to read with lots of inspiring thoughts and ideas.

Bang, Jan. Ecovillages. Philadelphia: New Society, 2005.

This book discusses many eco-villages that exist and talks about the importance of personal, social and ecological living standards. Each topic is discussed in great detail with case studies to provide evidence for the points and concepts they argue.

Carpenter, William. Modern Sustainable Residential Design. New York: Wiley, 2009.

This text is a guide for design professionals when it comes to sustainable design in residential buildings. Most of the examples are located right here the U.S. and there are lots of pictures, diagrams and drawings to go along with the text.

Corbett, Judy. Designing Sustainable Communities. Washington: Island Press, 2000

This book analysis and learns from village homes. They use and refine the techniques used by village homes to design a sustainable community. Though it seems out of date, the useful insights on what they learned from the village homes seem very helpful.

Dunnett, Nigel and Andy Clayden. Rain Gardens. Portland: Timber Press, 2007.

The authors created this book for anyone at home that would like to create their own rain gardens or collection "ponds/tanks". At the end of the guide they even have a glossary of the types of grasses and plants that would be used in wetlands and other water reuse projects.

Eicker, Ursula. Low Energy Cooling for Sustainable Buildings. New York: Wiley, 2009.

This reference guide has a complete overview of cooling systems that exist already and some sustainable techniques that are just being discovered. It is an excellent data source and is full of comprehensive material on sustainable cooling systems.

Dreiseitl, Herbert. New Waterscapes. Birlhauser (Princeton Architectural Press), 2006.

This book is a great reference to text and photos of larger "waterscapes" that have already been built in our world. They mostly focus on mostly public spaces that incorporate water into the design of the project and design.

Farr, Douglas. Sustainable Urbanism. New York: Wiley, 2008

Examines multiple case studies of sustainable urbanism with complete overviews of how they work and the techniques they use.

Gallacher, Pauline. Everday Spaces. London: Thomas Telford, Ltd, 2005.

This book examines the potential of neighborhood spaces; it looks at innovative public spaces that are found in ordinary neighborhoods throughout the world. The color images and text really allow you to understand the function of a public area.

Gauzin-Muller, Dominique and Nicolas Favet. Sustainable Architecture and Urbanism. Boston: Birkhauser, 2002.

The author has done a great job of writing a book on his experiences with sustainable architecture through concepts, technologies and examples. He also expresses the importance of valuing natural materials to make these concepts successful.

Gauzin-Müller, Dominique. Sustainable Living. Birkhäuser Basel, 2006.

It discusses how to integrate sustainable materials and how to change the standard ways of living to become more sustainable in a household.

Hutt, Dana and Susanne Jaschko. Open House. Vitra Design Museum / Art Center College of Design, 2006.

Modern technologies are discussed that are available to us that we can use to change residential architecture. There are multiple essays that are included that give different insight on new technologies.

Jodidio, Philip. Architecture Now! Green Architecture. TASCHEN America Llc, 2009.

This book is full of examples and precedents of innovative building strategies. Most of projects have not been built yet, but it really shows how some firms are going all out to be green and sustainable.

Katz, Peter. The New Urbanism. New York: McGraw-Hill, 1994.

This book seeks to restore the civil realm to urban planning by designing and integrating the pedestrian realm with the urban development and public transportation. It seems interesting though I have not ordered it yet.

Kwok, G., Alison and Walter Grondzik. The Green Studio Handbook. Oxford: Architectural, 2007.

The book deals with environmental and sustainable strategies that are used during schematic design. These strategies should be able to help me out during the planning process of my project.

Lawson, Bill. Building Materials Energy and the Environment. Sydney: Unisearch Ltd, 1996.

This book really focuses on organic materials with a list of case studies toward the end. At the end of the book is a list of common materials with the amount of energy that is used to create and build with that particular material size.

Low, Nicholas. The Green City. New York: Routledge, 2005.

This book really focuses on the global agenda and a smaller scale to stay environmentally sustainable and explores new methods of planning and building that need to be more considered.

Mazmanian, Daniel and Michael Kraft. Toward Sustainable Communities. Cambridge: MIT Press, 1999.

First the book describes environmental policies over the past three decades mostly in the U.S. and then proceeds in investigate innovative strategies from six different cases studies in the U.S. dealing with air, water, land use, transportation, redevelopment and regional ecosystems.

Melet, Ed. Sustainable Architecture. City: Nai Uitgevers Pub, 1999.

This book focuses on the functional and environmental demands that designs of buildings and cities should meet. It includes many case studies and remarks from society experts to architectural planners.

Mennel, Timothy et.al. Block by Block: Jane Jacobs. New York: Princeton Architectural Press, 2007.

This book is full of essays that discuss and relate to the topics and theories of Jane Jacobs, some even question if her thoughts and theories are even relevant to the 21st century.

Mumford, Lewis. Technics and Civilization. New York: Harcourt, Brace & World, 1963.

As a planner many remarkable things were mentioned throughout the book but primarily focused on the three periods of technological history that exist.

Mumford, Lewis. The City in History. New York: Harcourt Brace & Co, 1989.

Lewis Mumford was a planning and urban thinker, most of the book is full of his observations and records that he has found while designing and dealing with cities, he also discusses the technological periods in this book as well.

Nyerges, Christopher. The Self-Sufficient Home. Mechanicsburg: Stackpole Books, 2009.

This illustrated book shows the everyday person how to cut costs and make the best use of your available resources to help our economy.

Register, Richard. Ecocities: Building Cities in Balance with Nature. Berkeley: Berkeley Hills Books, 2001.

Richard Register has really examined the role of cities and has really created an overall satisfying and comprehensive book on the subject.

Sale, Kirkpatrick. Human Scale. City: New Catalyst Books, 2007.

Kirkpatrick Sale really examines the Human Scale in her book, and not just her own opinion but examines many other experts' opinions about the same subject. I focused more on the chapter about community scale, but the whole book was full of fascinating data.

Sewell, John. The Shape of the City. Toronto: University of Toronto Press, 1993.

This book discusses the problems and steps that have been taken to redesign and make Toronto a better place for inhabitants to live in. Many extraordinary examples come from the Canadian city are found in this book.

Slone, K., Daniel et.al. A Legal Guide to Urban and Sustainable Development for Planners, Developers, and Architects. New York: Wiley, 2008.

This book is a guideline to practical and legal issues dealing with urban and sustainable development tactics. It includes real-world solutions with case studies, pictures and illustrational diagrams.

Smith, Peter. Eco-Refurbishment. Oxford: Architectural, 2003.

This design guide provides a comprehensive and easy to understand outline of how to improve and refurbish your house to become 'green'.

Steele, James. Sustainable Architecture. New York: McGraw-Hill, 1997.

The book discusses and the problems with the 'sustainable development' that we've been creating and how awful our modern construction materials have been recently. This book will outline the key ways of fixing this dilemma and how we can change the materials and methods we use to help our country.

Strongman, Cathy. The Sustainable Home. London England: Merrell Publishers, 2008.

This book is a complete guide to eco building, renovation and decoration.

Williams, Daniel. Sustainable Design. New York: Wiley, 2007.

Williams gives a complete overview and as well as his own opinion on sustainable design and how we live and what needs to change to become a sustainable world.

Winter, Mick. Sustainable Living: For Home, Neighborhood and Community. Napa, CA: Westsong Publishing, 2007.

The subject of this book is about the environment and sustainable living. It breaks up the book into sustainable aspects for the home, neighborhood and community and includes helpful websites that encourage and support sustainable techniques.

Wojtowicz, Robert. Lewis Mumford and American Modernism. Cambridge: Cambridge University Press, 1996.

This book is created ten years ago pretty much analyzing and summarizing Lewis Mumford's life and impact on our World. It focuses on his utopian themes for architecture and urban planning.