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## New Urban Living: High-Rise Vertical Farming in a Mixed Use Building, Boston, MA

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# New Urban Living

High-rise vertical farming in a mixed use building: Boston, MA

Independent Thesis Project Submitted to Roger Williams University SAAHP  
In fulfillment of the requirements of the Bachelor of Science/  
Masters of Architecture Dual Degree  
School of Architecture, Art and Historic Preservation  
Graduation Date: May 2011

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## Table of Contents

Introduction . . . . .	1-4
Problem Statement . . . . .	5-9
Project Statement . . . . .	10-11
Precedents . . . . .	12-36
Client . . . . .	37-38
Seaport Development Plan . . . . .	39-44
Site Identification . . . . .	45-60
Program . . . . .	61-62
Final Design . . . . .	63-124
Appendix A (Communitarian Settlements). . . . .	i-xii
Appendix B (Extended Seaport Development Plan). . . . .	xiii-xxvii
Appendix C (Gate Review Design Sheets). . . . .	xxix-xxxviii
Appendix D (Final Presentation Design Sheets). . . . .	xxxix-xlvi
Bibliography . . . . .	xlvi-xlviii



# Introduction

## Reinterpreting & changing the way we live -- [Community]

What is a 'Community' defined as?

What is a 'Community' in our society today?

What should a Community be?

The dictionary definition of a community is "1. A body of people having common organization or interests or living in the same place under the same laws. 2. ~~Society at large; the people in general~~; restrictedly, the people of a particular region, or the region itself."<sup>1</sup> What I define as a COMMUNITY is an assemblance of people having common organization or interests that work/live together towards a common goal or lifestyle. A true representation of this type of place is truly lacking in today's society.

A community is a complex organization. More importantly, a community is not just the people who are in it. A community already existed when all of its current residents were not yet born, and it will likely continue to exist when all of the people in it have left. It is something that is beyond its very components, its residents or community members. A "community" in some senses may not even have a physical location, but be demarcated by being a group of people with a common interest. A human settlement, or community, is not merely a collection of houses. It is a human (social and cultural) organization. Also, it is not just a collection of human individuals; it is a socio-cultural system; it is socially organized. The community has a life of its own which goes beyond the sum of all the lives of all its residents. As a social organization, a community is cultural and is ultimately a system of systems.<sup>2</sup>

In a society where speed is of ultimate importance, maybe that is the cause for what is leading our civilization in the wrong direction. Communities, today, are most often planned by a contractor or developer with little concern for site relationship and/or the interaction between different houses. Each house has its own plot of land, cuts off much communication with its "neighbors", and inherently much wasted space is the result. These homes, which often times cause more social problems for the families that live within them because of their size and disconnection between family members, are extremely expensive and don't provide a quality lifestyle.

<sup>1</sup> Meriam Co., G. & C. Webster's New Collegiate Dictionary. Springfield, MA, 1975 pp. 167.

<sup>2</sup> Bartle, Phil PhD. *What is a Community? A Sociological Perspective*. This source provides a different viewpoint of community and some of the defining characteristics.

*"A technologically and bureaucratically organized society threatens autonomy. It makes self-sufficiency a more impossible ideal than ever, and wraps the ordinary individual in a network of external organization and regulations. But it is this kind of society that has also promoted variety of experience and acquainted more people with the freedom and irritation of choice. It is the matrix of the new moral expectations that have made autonomy for the many an issue." Self-sufficient is a term closely related to "Sustainability." To say that a building or community is self-sufficient creates a positive connotation or response to a design. It is a desired goal by many and possibly one of the best ways to strive to be "Green." A society that has community based ideals and a goal to be self-sufficient not only is better for the environment, but also for the individuals within the community.<sup>3</sup>*

There seems to be a major misconception in society when using the term 'community.' I am referring specifically to rural/suburban areas that have become such a problematic area. A neighborhood consists of people that for the most part don't even know each other's name. Is there a better way to live, a way that allows for more people to afford certain 'luxuries'? A community should be a place where people share a common goal and work together to achieve it. Architecture has the ability to change/affect the way people feel, interact, and ultimately live together. [Community]

*"When it comes to density, neighbors often demand that new homes be isolated on ranch or estate-sized parcels. Suburbanites believe that large lots are necessary for several reasons. First, larger lots logically mean fewer homes, fewer homes mean fewer people, and fewer people mean less traffic, less school crowding, and less demand for public services. Second, to minimize competition for parking, protect views, and maintain privacy, existing residents want a buffer between themselves and new development. Third, burdening a new home with costly land is an effective way to discourage lower-income residents from moving into the neighborhood, a goal that is important to some existing residents. Finally and probably most importantly residents often insist that the only way to preserve the nonurban character of the community is to prohibit the high-density housing and population that they associate with urban development patterns."<sup>4</sup>*

### Overview:

The focus of the project is the combination of vertical farming and living in a structure that provides for itself and the surrounding community. Essentially, the result is **communal living through vertical farming**. To raise awareness and invite surrounding neighbors and workers into the process, the first four floors are dedicated to social interaction and a display of the systems at use. Along the path from a public market, to a café, and finally to a gathering space, visitors walk along a ramp/display of the aquaponic system.

<sup>3</sup> McCord, William. *Voyages to Utopia: From Monastery To Commune – The Search For The Perfect Society in Modern Times*. W.W. Norton & Company. New York and London, 1989. pg 324

<sup>4</sup> Schmitz, Adrienne. *The new shape of suburbia : trends in residential development*. Washington, D.C. : Urban Land Institute, c2003. Pg. 121





Image 1: View along ramp with aquaponic display as rail/display. [(Render created using Revit Architecture 2011)]



## Problem Statement

### *[UNDERLYING THOUGHTS]*

In what way should people live to benefit both the quality of life and the relationship between neighbors?

What is Community and how can Architecture strengthen or change social interactions in the living environment?

How are people brought together; what type of activities and spaces are needed to stimulate the sense of living 'together?'

### The City

There are many positive aspects of the city: use of **density**, opportunity for people to come together at parks/community centers/venues, multiple job opportunities, and affordable housing. However in many places there are extremely **low standards of living**, problems with pollution/traffic, and often violence. A focus has been placed on the city as many of the government buildings and events take place here. Along with improvements in the cities, we need to take advantage of **rural development** as well, primarily by taking the successful aspects of rural life and integrating them into the city. **Connecting** big business in the city to smaller rural developments outside of the city, so that commuting can be cut down and standards of living increase are issues that need to be resolved.

### The Alternative

Looking at suburban and rural living now, there is a **lack of community** and a sense of working together for a shared purpose. In many neighborhoods it isn't even uncommon that people living within a hundred feet from each other don't even know each other. During the day there tends to be **empty** houses (that are usually oversized) with an acre of land surrounding them. There is a complete **waste** of land and energy to heat and cool spaces that are only used from 4 or 5 pm until families leave for work or school. With a lack of density and complete isolation at the fore-front or rural living there is also a problem with the construction/materials. Houses evolved from cement plastered walls to sheetrock walls. The flooring went from hardwood to synthetic carpet over a foam underlayment. And siding went from wood clapboards to texture plywood to vinyl imitation clapboards. Early settlements gave way to houses plunked down on lots just big enough to append a garage, a swimming pool, a deck, and a decorative lawn. These structures depend on a constantly shrinking supply of oil and gas for everything. They live as **isolated islands** that receive daily deliveries of electricity, gas, water, and recreation. Almost everyone in these houses goes to the city to work.<sup>1</sup>

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<sup>1</sup> Burnham, Richard. Pg. 25-26



In early American Settlement, specifically communitarian settlements, the positive characteristics of the rural lifestyle can be seen. A true sense of community can be found in some developments and the goal to be self-sufficient (can also be called 'sustainable') is a basis for later establishments such as eco-villages and cohousing. The creation of settlements with communal living standards, such as group cooking, dining, and meeting space are positive elements of such settlements and their approaches can be reworked in a new city lifestyle. The following are some of the successful aspects of former Communitarian Settlements:

- 1.The more successful experiments have created environments, particularly in agriculture, in which people expect and receive fair treatment as well as reasonable incentives based on merit.
- 2.They have built educational systems that provide intellectual scope and vocational skills, and nurture inquisitiveness, critical faculties, and creativity.
- 3.They have built mixed economies, in which public funds provide public goods (schools, dams, roads, electricity, and the like) while each individual can pursue creatively his/her own private goals in the production of goods and services.
- 4.They have admitted foreign elements – either people of a different nationality, ethnic group, or religion, or enterprises with an international base; these have brought needed capital, skills, and creative energy.
- 5.They have created stable political systems, with leaders willing to conduct a dialogue with their followers, to compromise on symbolic issues, to dispense with force as a way of punishing dissent, and to mediate old antagonisms in a search for mutual prosperity.<sup>2</sup>

There is a more in depth analysis of the Early Communitarian Settlements in the Appendix A that provide the inspiration for the alternative living style to be introduced into a city environment for the proposed project.

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<sup>2</sup> McCord, William. *Voyages to Utopia: From Monastery To Commune – The Search For The Perfect Society in Modern Times*. W.W. Norton & Company. New York and London, 1989. Pg. 336-37

"By the year 2050, nearly 80% of the earth's population will reside in urban centers. Applying the most conservative estimates to current demographic trends, the human population will increase by about 3 billion people during the interim. An estimated **10<sup>9</sup> hectares of new land** (about 20% more land than is represented by the country of Brazil) will be **needed to grow enough food** to feed them, if traditional farming practices continue as they are practiced today. At present, throughout the world, over 80% of the land that is suitable for raising crops is in use (sources: FAO and NASA). Historically, some 15% of that has been laid waste by poor management practices. What can be done to avoid this impending disaster?

A Potential Solution: **Farm Vertically**

The concept of indoor farming is not new, since hothouse production of tomatoes, a wide variety of herbs, and other produce has been in vogue for some time. What is new is the urgent need to scale up this technology to accommodate another 3 billion people. An entirely new approach to indoor farming must be invented, employing cutting edge technologies. The **Vertical Farm must be efficient** (cheap to construct and safe to operate). Vertical farms, many stories high, will be situated in the heart of the world's urban centers. If successfully implemented, they offer the promise of urban renewal, sustainable production of a safe and varied food supply (year-round crop production), and the eventual repair of ecosystems that have been sacrificed for horizontal farming."<sup>3</sup>

Indoor growing not only proves to be a more efficient solution for crop production but takes the risk of weather and pesticides away. We see tragedies and natural disasters all over the world; entire cities and even food sources wiped out. To ensure that there is a viable food source, farming vertically in the cities is a perfect alternative or compliment to traditional farming. In many precedents we can see farming as the central activity in many rural communal living environments. The same thing is possible in the heart of the city. Communal living through vertical farming is the solution not only to feeding people but to create a new lifestyle.

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<sup>3</sup> Dickson Despommier. The Vertical Farm Project. <http://www.verticalfarm.com/>

### Advantages of Vertical Farming

- Year-round crop production; 1 indoor acre is equivalent to 4-6 outdoor acres or more, depending upon the crop (e.g., strawberries: 1 indoor acre = 30 outdoor acres)
- No weather-related crop failures due to droughts, floods, pests
- All VF food is grown organically: no herbicides, pesticides, or fertilizers
- VF virtually eliminates agricultural runoff by recycling black water
- VF returns farmland to nature, restoring ecosystem functions and services
- VF dramatically reduces fossil fuel use (no tractors, plows, shipping.)
- VF converts abandoned urban properties into food production centers
- VF creates sustainable environments for urban centers
- VF creates new employment opportunities
- We cannot go to the moon, Mars, or beyond without first learning to farm indoors on earth
- VF may prove to be useful for integrating into refugee camps
- incidence of armed conflict over natural resources, such as water and land for agriculture<sup>4</sup>

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<sup>4</sup> Dickson Despommier. The Vertical Farm Project. <http://www.verticalfarm.com/>

## Project Statement

The objective of the project is to **develop an alternative** to current living conditions in the city. In order to develop new living conditions and social interactions a new combination of program elements will be introduced. Within the structure there will be a focus on including the surrounding community members by creating not only commercial lower levels, but incorporating public spaces throughout the building. The residents will be provided the opportunity of live/work either within their own units or by utilizing **community spaces**. Along with shared spaces, residents will be provided with shared facilities to promote communal living and stimulate interaction. Another major component to the proposed project is agricultural production by the means of vertical farming. Incorporating agriculture production with communal living could be a possible solution, at minimum a sustainable alternative to current living conditions in the city.

The objective is to create a society that is driven by community based ideas and production rather than individualistic goals. A project that results in a community that strengthens the relationship between its inhabitants through programming and communal living facilities. In the Seaport District of Boston the SAND community has been fighting for a part of the new development plan that doesn't fully acknowledge the people who already live there. A design intention that respects the true roots of the people who live there and not just build a development that promotes business and tourism. The program will reflect the business men and women, the artists of the area, entrepreneurs, farmers, and those people interested in an alternative living atmosphere.

### Designing for a New Lifestyle in the City

Four 'L' shaped clusters of 22 units each surround a greenhouse that is located on the southern corner of the building, all of which sitting on the base (consisting of market, café, and gathering space). The two major forms of agricultural production are aquaponic trays over tilapia filled water and rotating 'crop wheels', also known as Omega Carousel Gardens. Farming in the city reduces the travel of produce from the country and can be used as a supplement to traditional farming. Most importantly the combination of vertical farming and living creates a place of social interaction and a building that literally provides for its community.



## Precedents



## Sargfabrik Housing and Services Cooperative

Designed by BKK3 Architects

Vienna, 1992-1996

- "Not a normal apartment but a 'residential home' or hostel which belongs to association.
- Communal facilities make "residential home" special.
- Old facility [coffin factory] could not be saved
  - Kept layout on original 4.8 meter grid and height 2.25 meters, by using double height spaces oriented towards daylight.
- Residents compare life to life in a village
- Close enough to each other to participate in community but able to withdraw when needed
- Residents pursue hobbies together
  - Cooking, gardening, making music, etc.

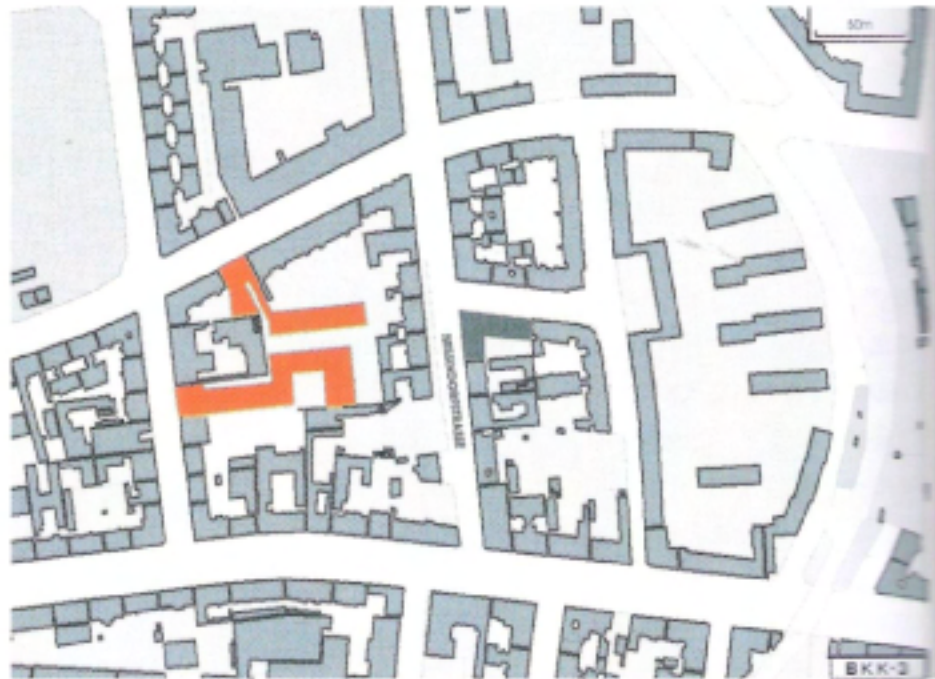


Image 2 &amp; 3: (left) Site Plan (right) Front Elevation [Refer to text citation BKK3 Architects]





Image 4: View of central passage with shops and public functions from BKK3 Architects [Refer to text citation]



- Residents compare life to life in a village
- Close enough to each other to participate in community but able to withdraw when needed
- Residents pursue hobbies together
  - Cooking, gardening, making music, etc.
- "It is not an autonomous implant in the city buy a symbolic part of the urban fabric"
- Communal functions for residents and available to general public
  - Baths, café, kindergarten, seminar center
- Tie to the city with program prevents Sargfabrik from "degenerating" to a 'gated community' in city
- Communal facilities amount to 20 percent of floor area
  - 1,800 square meters of 7,700 square meter project
- Flats are considered "home places", café became the "hostel kitchen", swimming pool called "communal showers", concert hall labeled the "music room", and kindergarten a "play space"
- Building consists of 75 flats with underground parking
- Public or semipublic permeability of the site is an important element in concept.
- "On entering the site you pass a café. It is two stories high and the large area of glazing flush with façade and rounded areas give it a freshness."
- The access to the seminar rooms are close to the café, they take up ground and mezzanine
- After the coffee shop pass through a foyer with a small bar into meeting hall, which houses multiple functions
- Then you pass the access to the turquoise colored bath with a swimming channel and sauna tubs
- The last reminder of the old coffin factory a white painted brickwork chimney reaches to the heavens<sup>1</sup>

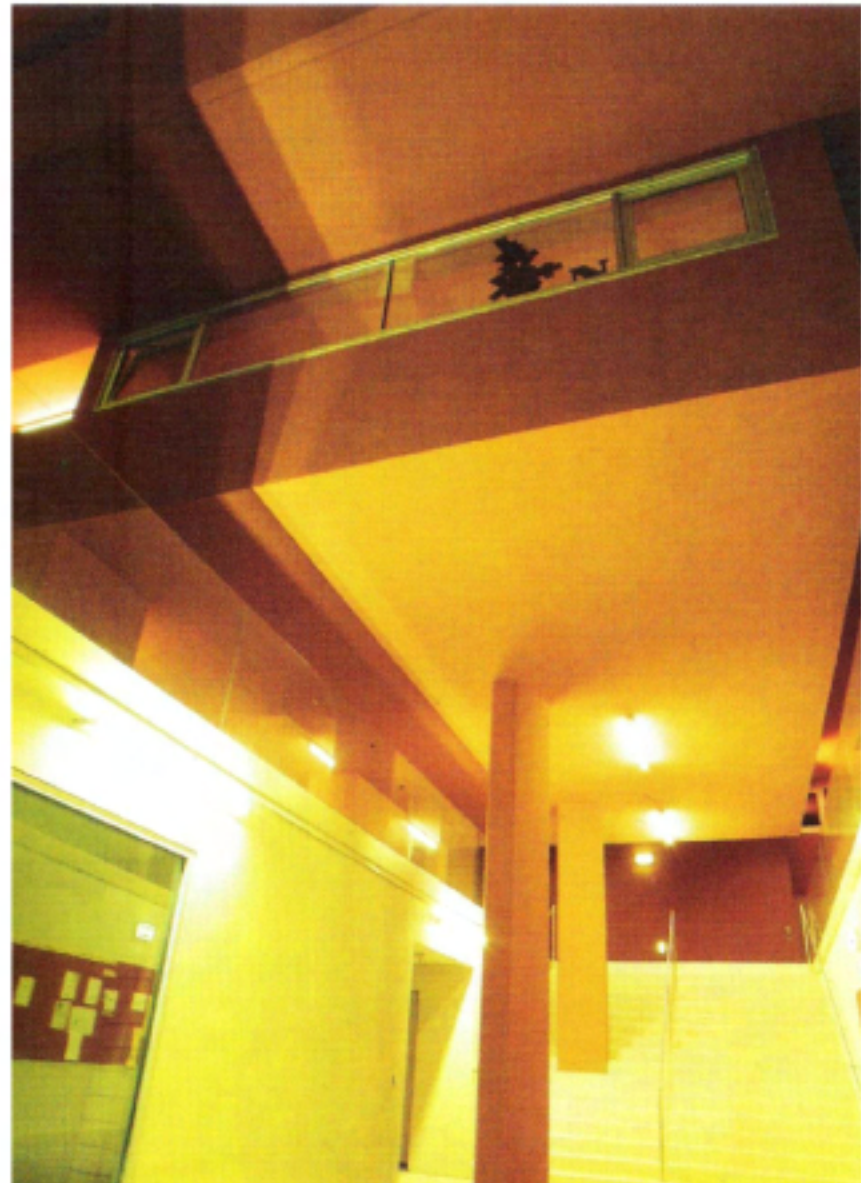


Image 5: Stair up to street elevation BKK3 Architects [Refer to text citation]

<sup>1</sup> BKK3 Texts by Bart Lootsma, Ilka and Andreas ruby. Barcelona





Image 6: Café on the left BKK3 Architects [Refer to text citation]

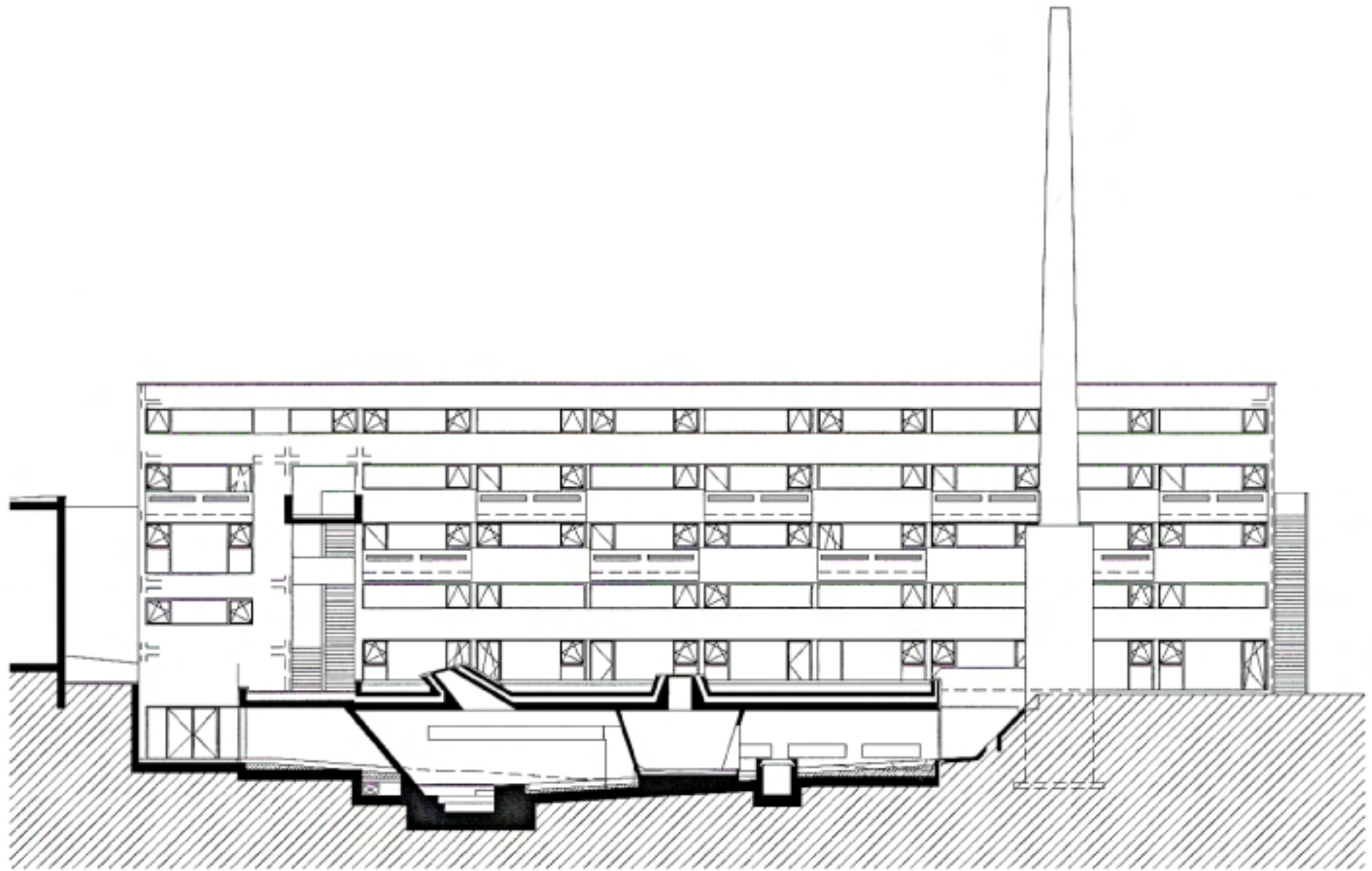


Image 7: Section through community spa (bottom). Existing chimney stack can be seen BKK3 Architects [Refer to text citation]



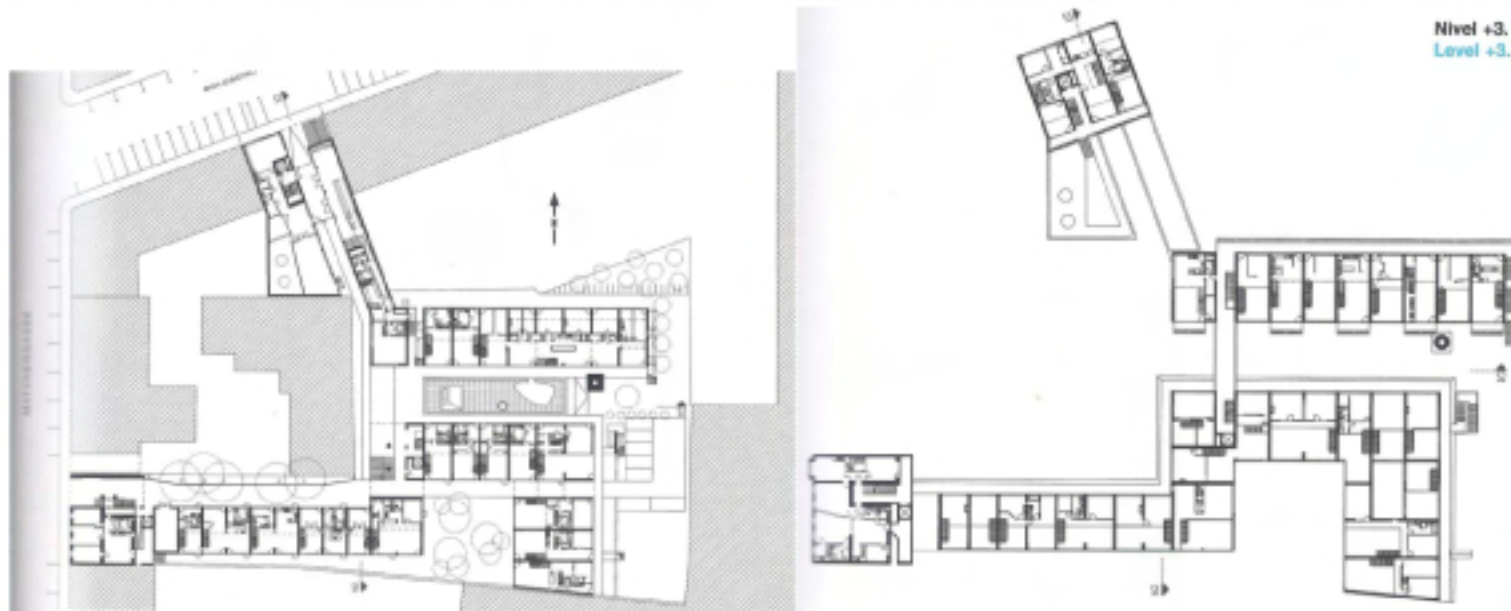
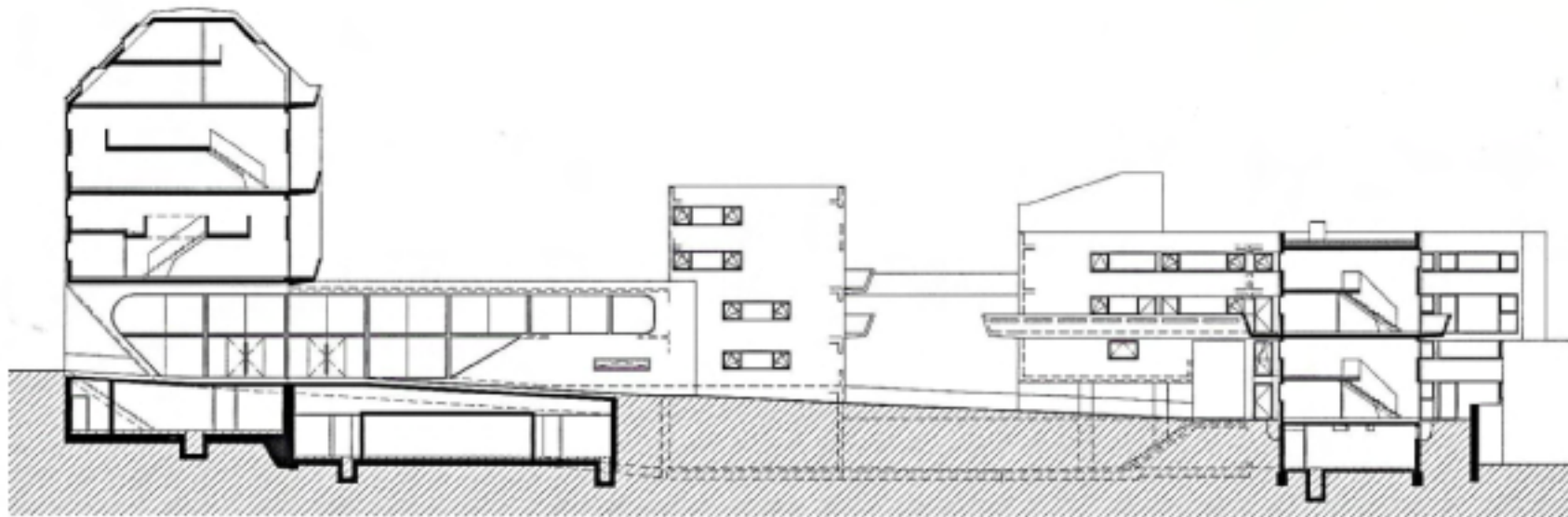


Image 8, 9, 10: (Top) Section through building (Bottom Left) Ground level plan (Bottom Right) Upper level plan BKK3 Architects [Refer to text citation]

**Four Clusters -- Odense, Denmark****Architect: Fallestegnestuen, Sten Holback, Erick Christiansen, and Frede Nielsen**

No. of Dwellings	80 Units in 4 clusters
Common Houses	4 at 3,875 square feet

This small group of residents from a 500 unit government subsidized housing project knew what they wanted: to develop a housing complex that would emphasize community and that would involve the residents both in the planning and ongoing management. Dissatisfied with the social isolation and health problem of the 1960s lock housing they lived in, the group took their proposal to the nonprofit housing organization that managed their complex. Several members of the group were familiar with cohousing, and one had been involved in the planning of the nearby Drejerbanken community. At the time they organized, cohousing was generally privately financed, and these residents could not afford that option. During their first meeting in December 1979, the residents asked the Odense Cooperative Housing Association to work with them to build a rental cohousing community. To their surprise, the association was not only receptive, but it already had a policy to support the development of cohousing.

The organizing group's initial goal was to develop a community of 20-30 units, but when they found a large site that fit their other criteria they worked out a plan for four groups of 20 units each. While OCHA handled the red tape involved in acquiring the site and financing the project, the resident group visited existing cohousing communities, clarified its goals, and interviewed architects. A brochure describing the proposed community was distributed at local libraries and public facilities to attract participants.

After some debate, the residents convinced OCHA to accept their choice of architect, even though he had less experience in housing than the others they had considered. Through his background in hospital design, architect Sten Holbaek had considerable experience with participatory design processes. From the earliest discussions about what residents desired, Holbaek brought up many new considerations. In assessing sample site plans, residents learned to articulate their

opinions about the relationship between community and private areas. Holbaek involved residents in the entire design process, even meeting with individual households to discuss their specific requirements. Looking back on the design phase, several residents credited the architect with helping them through the most difficult stages when they were considering abandoning the project.

Although the four clusters at Bondebjerget have almost identical common facilities, each has its own personality. Group One's residents were the most involved in the planning process and include the projects initiators, so they know each other and the development's history better than do the other clusters. Only one family from Group One moved out during the first three years of occupancy, and the reason was job related. Common dinners are available three to four times a week, averaging 40 participants (75 percent) on any given evening. Although residents of the third cluster did not participate in the planning process, most of them had worked together in a local political organization before moving in. This shared experience made their transition to cohousing relatively easy. Group Three is now the most active cluster; all residents participate in the common dinners, which are available every night of the week. Group Four was the last to move in, and eight months after the first, and they did not know each other beforehand either. Acknowledging that it has taken time to get acquainted, they were generally pleased with the community. "We don't dismiss each other's ideas or opinions – our attitude is let's try it," explained one resident. Several households moved in without understanding the cohousing concept and found it was not for them. Having survived this turnover, an adjustment period of getting to know each other, and trials of various organizational systems, Group Four is settling in.

One of the advantages of such a large community is the wide range of activities made possible. The Cultural Committee organizes a monthly film club, theater classes for children, special lectures, and musical events. The Buying Association allows residents to purchase many items at a discount. Bondebjerget is also directly across from a school that many of the children attend and whose facilities they can use. In the work at Bondebjerget, they were struck by similarities among it and the entirely owner-occupied cohousing communities seen before. The degree of resident involvement, the types of common activities, and the interaction among neighbors were all very similar. The primary difference is the relatively low monthly cost, and who can therefore afford to live there.<sup>2</sup>

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<sup>2</sup> McCamant, Kathryn. *Cohousing : a contemporary approach to housing ourselves*. Berkeley, Calif. : Ten Speed Press, c1994. Pg 123-25





Image 11: (Left) Site Plan (Right) Images of common dining facilities [McCamant pg. 123]

Common house floor plan.



Image 12: Floor Plan of communal dining and daycare facility [McCamant pg. 126]



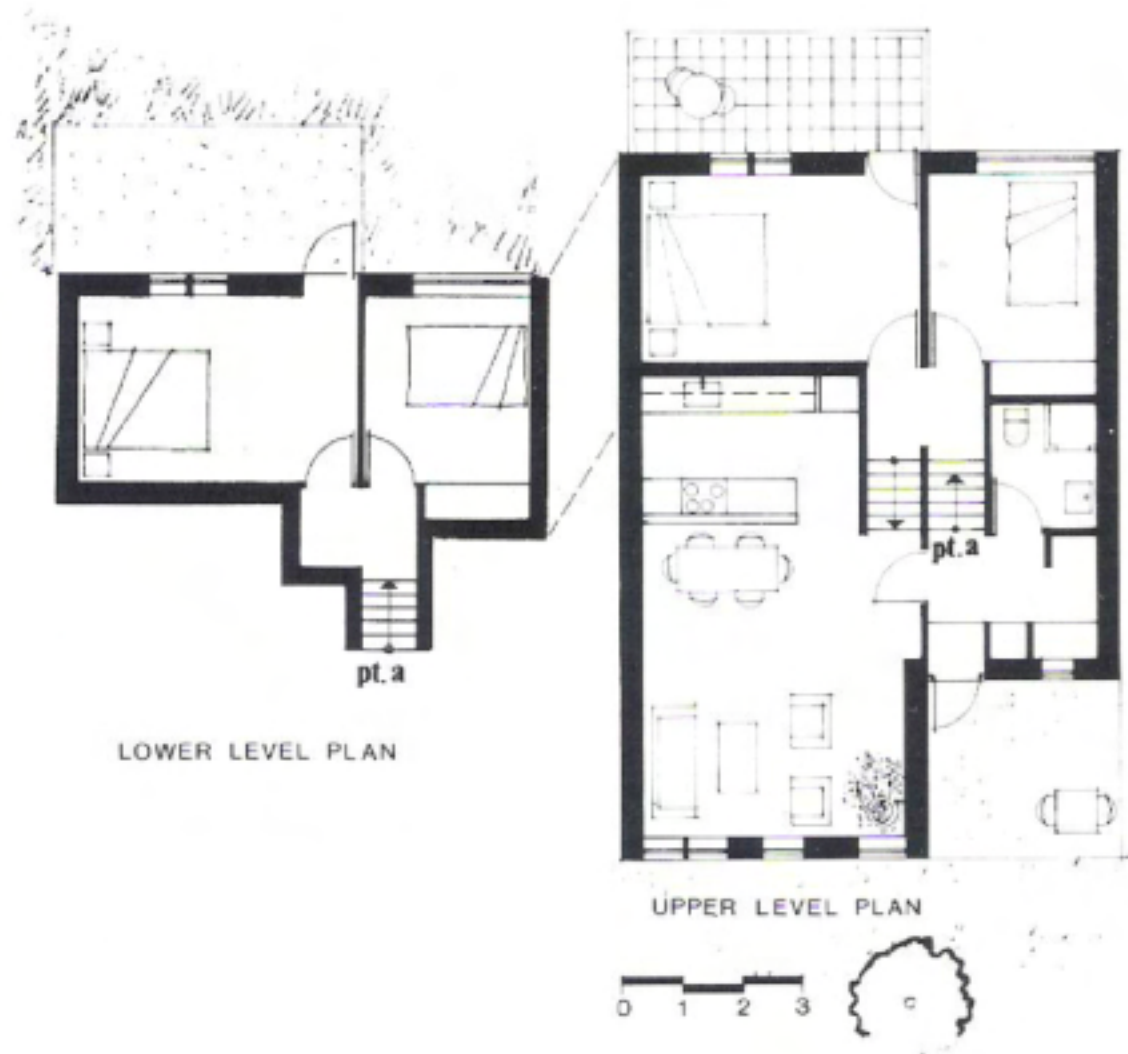
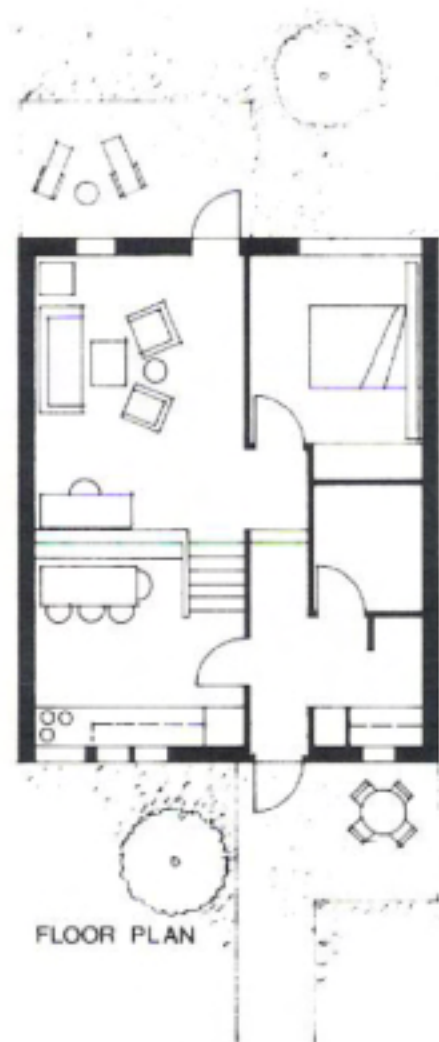


Image 13: Dwelling Unit plans [McCamant pg. 125]



Image 14: Dwelling Unit Section [McCamant pg. 126]

The site plan for this project is successful in its separation of units into four clusters with community spaces in the center. Large communal spaces provide spaces for community members to eat together and develop relationships. The interactions in this building strengthen the relationships outside of the communal spaces and strengthen the society overall. Each individual dwelling unit provides for private outdoor areas and the sectional qualities of the unit create split levels and varying ceiling heights.

**Tinggarden, Herfelge**

South of Copenhagen, Denmark

**Architect: Tegnestuen Vandkunsten**

No. of Dwellings	130 Units
Site Area	5.88 acres
Density	22 units per acre
Size of Dwellings	
5 basic house types	710-900 square feet
Communal house	136 square feet
Construction: masonry is of mottled red brick; non-load bearing walls are fiber board; external cladding of Swedish red boarding; sloping ceilings in the all-purpose rooms are clad in timber boarding; floors are bleached ash parquet; roofs of grey, corrugated asbestos cement sheeting.	

Tinggarden in Herfølge was one of the first nonprofit making housing projects to be built in Denmark during the 1970s. It was also one of the first in which the residents had a say regarding the design. The idea that occupants should have a wide degree of freedom in deciding the layout of their own homes was a new concept at the time, but with the support of the Danish building Research Institute, the architects contacted a number of families who had expressed interest in helping to plan their own housing development.

The residents were originally more concerned with organization than with the physical design aspect. They wanted a mixture of owner-occupied and rented dwellings; they wanted larger share of the building area devoted to common facilities than usual – even though this meant a reduction of the individual dwelling. The houses differ widely, both in design and materials and are thus an illustration of how it can be possible, in a new, carefully planned development, deliberately to incorporate accidental character and surprises.<sup>3</sup>

<sup>3</sup> Colquhoun, Ian. Pg 229



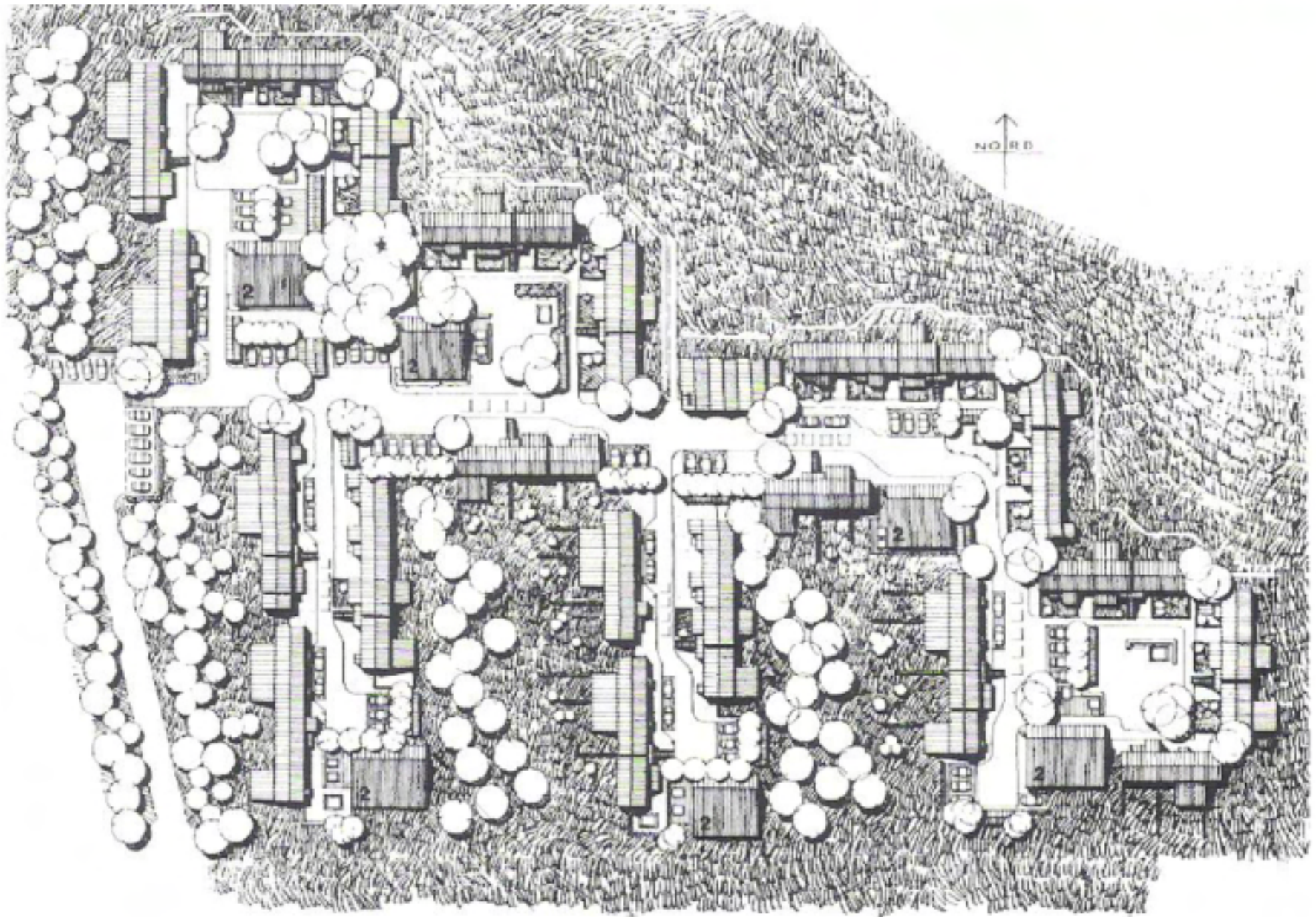


Image 15: Site Plan of the cluster housing co-operative development [Colquhoun pg. 230]





Image 16: Image of the co-operative [Colquhoun pg. 230]

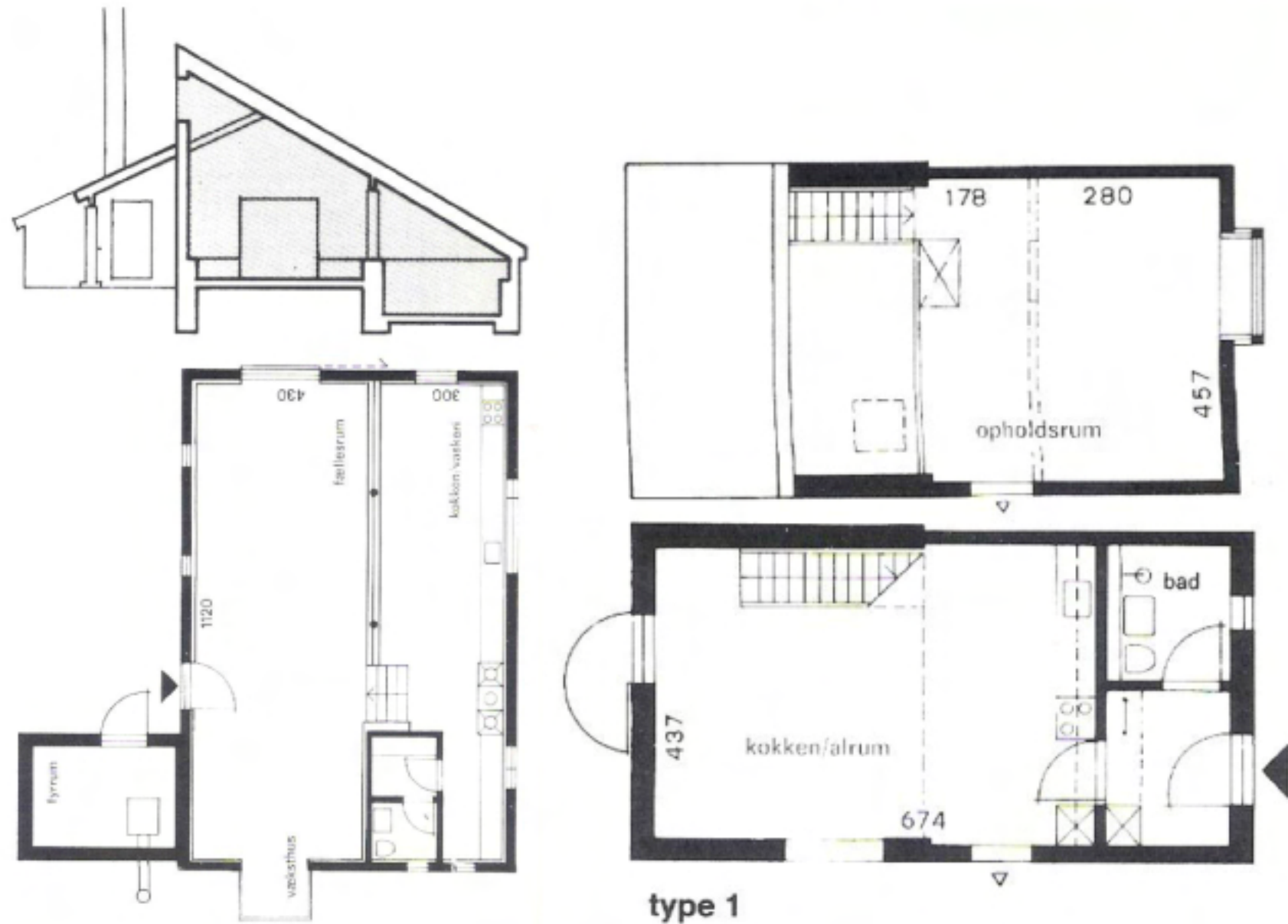


Image 17: (Left) Plan and section of the community room (Right) Smaller, individual residences [Colquhoun pg. 231]



Different unit types, rental and ownership, is a concept that allows people with a range of incomes to be a part of the community. This site plan creates many different outside community areas and courtyards. The square footage of the units is lower than typical houses and apartments in the U.S. and creates a higher density of dwelling units.

Image 18: Basic plans can be extended by adding the above supplementary rooms [Colquhoun pg. 231]





**Mollegarden Care Center -- Gladsaxe, Copenhagen, Denmark****Architect: Erik Ejlers and Henning Graversen**

No. of Dwellings	106 Units
Site Area	14.3 acres
Density	9.4 units per acre
Size of Dwellings	
Protected Dwellings	496 square feet
Nursing care units	285.6 square feet
Parking/Garages	84 car parking spaces in 1 area
Construction: concrete post and beam construction; facades are light, wood-clad elements; the roofing material is black corrugated translite.	

The site lies on the outskirts of Copenhagen and borders on to green areas and a lake. The project comprises dwellings for elderly people with different care needs. It includes a day centre which offers service and treatment to the residents and to elderly people living in the neighborhood. The architects were anxious to avoid an institutional atmosphere and therefore designed the project in a dense/low-rise form of one and two storeys. The protected dwellings are grouped along covered pedestrian streets. The streets of dwellings are arranged around green courtyards and outdoor recreation spaces.

The day centre and the nursing care units are located in 2 two storey wings. The units are one room apartments with bath, tea kitchen, and a small terrace. On the floors above are communal living rooms and observation rooms, doctor's offices. The ground floor of the day center contains activity areas and a living room, while the first floor is reserved for therapy, doctor's offices and administration uses. The different function of the outdoor areas is marked by changes in the character and color of the paving, rather than indicating the difference by curbs and other changes of level.<sup>4</sup>

<sup>4</sup> Colquhoun, Ian. Pg. 200

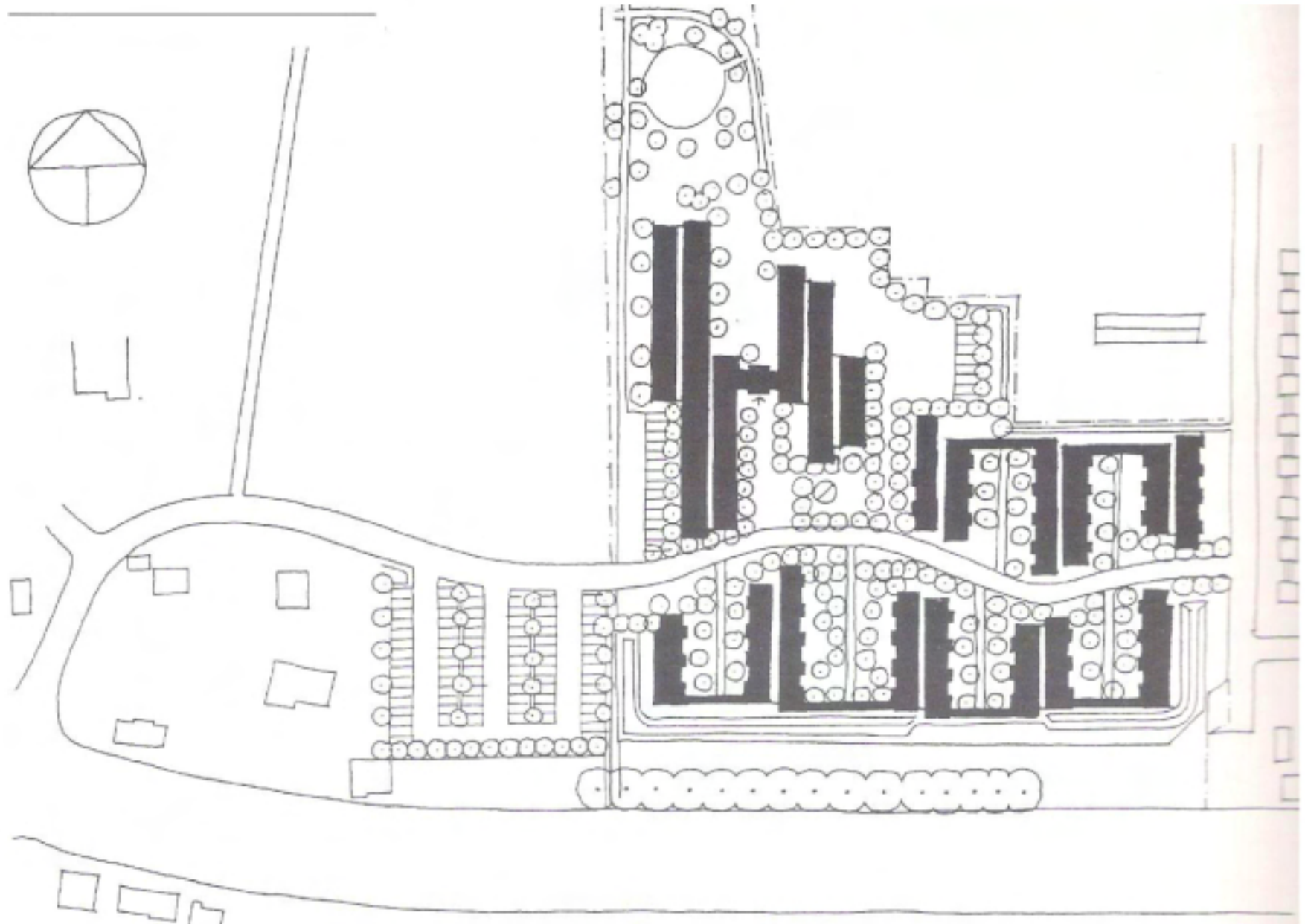


Image 19: Combination of single bar and 'u' shaped units. Site Plan [Colquhoun Pg. 200]

### Vertical Farm Prototype One

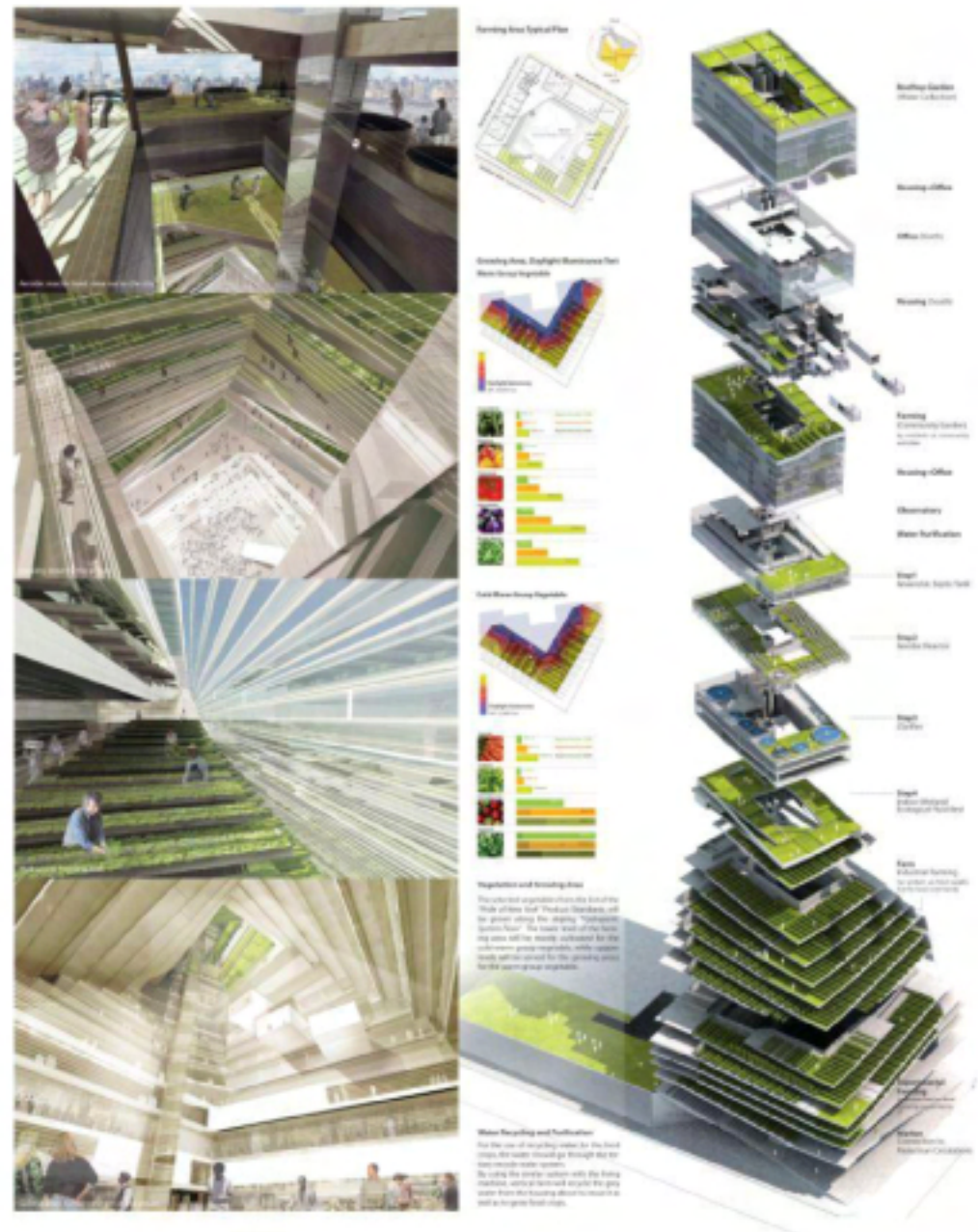


Image 20: "Urban Farm, Urban Epicenter" by Jung Min Nam [<http://www.verticalfarm.com/designs>]

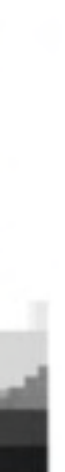
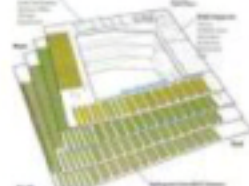




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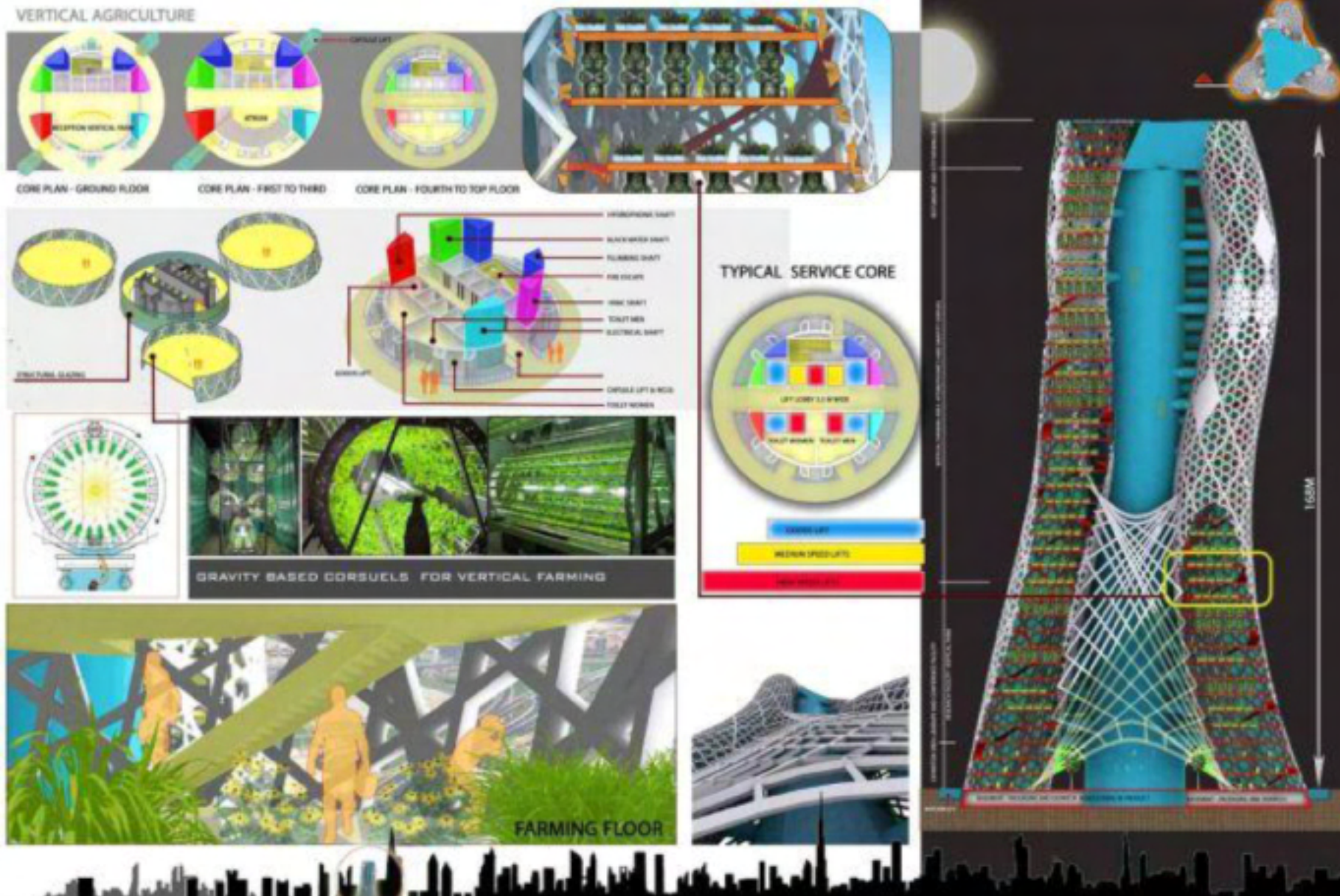
## Hydroponics: Growing Food + Supporting Progress

ing time, 1990



- 33 -

## Vertical Farm Prototype Two

Image 22: Zabeel Park Vertical Farm [<http://www.verticalfarm.com/designs>]



## Vertical Farm Prototype Three



Image 23: "The Living Skyscraper: Farming the Urban Skyline" by Blake Kurasek [<http://www.verticalfarm.com/designs>]



## Client

### **Boston SAND**

#### **Seaport Alliance for a Neighborhood Design**

The Seaport Alliance for a Neighborhood Design is an organization that has worked on and responded to various developments in Boston, MA. They have worked with the Boston Redevelopment Authority (BRA) on the development of the Seaport District in South Boston. In an effort to respect and acknowledge the artist based community already in the area, the proposed thesis project will represent this community's goals and ideals in the already developed Seaport Square Project by the BRA.

Founded in South Boston's historic Fort Point Channel neighborhood, SAND is mandated to advocate for long range planning ideals, envisioning the South Boston waterfront as a vibrant, diverse community with a distinctive character and sense of place. The charter at SAND is to represent a collective voice of Boston-based residents, business owners, artists, architects, urban planners, cultural institutions and community groups in the public waterfront development process. Through its work with the community, elected leaders and area stakeholders, SAND's mission is to ensure that our community evolves with a critical mass of residential development, adequate public realm amenities and recreational green space, civic and cultural space, commercial establishments and other neighborhood ideals as projects are approved. Over decades to come, SAND anticipates that over ten thousand Bostonians will choose Fort Point and the South Boston Waterfront as a neighborhood in which to invest their lives. Considering a \$7.35 billion investment by all taxpayers into the Seaport District infrastructure and harbor cleanup, a "neighborhood" vision of development not only possible – it is critically important to ensure a return on the public investment. SAND's vision of a Waterfront neighborhood is supported by Boston's history which demonstrates that mixed-use neighborhoods provide stable growth, economic return and vitality through economic cycles, unlike areas heavily invested to address specific markets (i.e. destination/commercial) favored by Boston's financial community and commercial interests. We expect a multi-generational return on the taxpayers' investment – not simply a 20-year projection on a balance sheet.

SAND's vision for Fort Point and the South Boston Waterfront as an urban mixed-use neighborhood was developed through a public dialog with our Fort Point community, developers, City officials, area stakeholders, and the traditional South Boston community. SAND members have served on the Boston Redevelopment Authority's Fort Point Working Group (2001-2003), the Fort Point Advisory Committee (2003-present), the Boston Landmarks Commission Study Committee (2006-present). SAND members were represented and participated in each of approximately sixty (60) public meetings held by the BRA regarding the development of the 100 Acre Plan, and resulting in the 100 Acre Plan PDA. SAND was integrally involved in the drafting of the City of Boston's South Boston Seaport Public Realm Plan in 1999 and the South Boston Municipal Harbor Plan in 2001.<sup>1</sup>

<sup>1</sup> Boston Sand. <http://www.seaportalliance.org/SAND/about.html>





## Seaport Development Plan

### Seaport Square – Setting the Standard for Innovation on the Waterfront



Seaport Square spans 23 acres on Boston's waterfront adjacent to the city's Financial District on the largest undeveloped parcel in the City of Boston. The 6.3 million square foot master plan, designed by Kohn Pederson Fox, envisions a vibrant 24/7 neighborhood in Boston's "Innovation District." The master plan calls for a unique fabric of residences, shops, restaurants, cultural and educational institutions, hotels, open spaces and a business district with research and office space. The City of Boston is in a global competition for companies, new ideas, new ways to work, creation of new jobs and the retention of the area's talent.

"Mayor Thomas M. Menino and his administration have taken a leadership role in setting forth a vision of The New Boston and designated the 1,000 acre South Boston Waterfront and the Boston Marine Industrial Park as the Boston Innovation District. The Seaport Square development is perfectly positioned to be the anchor and lead the way for that vision. Innovation in design is a critical piece for the creation of a commercially viable community, and sustainability is a crucial aspect of designing for the future. However, it is only part of the equation. What differentiates Seaport Square is its unequalled ability to deliver the environment, platform and services required for the critical interactions and collaboration that lead to innovation. Our goal is to create fertile ground from which innovation and transformation, as well as physical and social networking, can occur. Proximity and culture matter. We plan to harness those ideals to the fullest to create a place where innovation can grow—organically."<sup>1</sup>



Image 24: Seaport Square PDF: Diagrams

<sup>1</sup>Seaport Square PDF. Live. Work. Shop. Play. Stay. Seaport Square in Boston's Innovation District. <http://www.bostonredevelopmentauthority.org>. Page 8.





Image 25: Seaport Square PDF. Aerial View



Seaport Square will contribute to Boston's tradition of neighborhoods with distinct identity, as a modern, cosmopolitan district with the activity and the densely-packed amenities of a tight-knit neighborhood. Boston is America's Walking City, a place where '10-minute living' is a reality— everything you need is not more than 10 minutes travel time away. Seaport Square, with its tight network of retail, culture hotspots, workspaces, housing and recreation spaces, will exhibit that feeling of closeness and accessibility, re-interpreting Boston's walkable identity for the future. Seaport Boulevard will aspire to have the impact of another Boston 'MainStreet'. Potential interactive installations like 'Where's Boston Now?' are being considered to celebrate the history and identity of a rich, storied city that is leaping forward into a new century.

The city's strategy for creating an 'Innovation District' requires abundant opportunities for a multi-generational, entrepreneurial population to 'Live', 'Work' and 'Play'. The character of the neighborhood will be forged by a range of world-class retail and dining, expanded operating hours for an active nightlife, interactive public art, rotating entertainment and cultural events, and a tapestry of diverse population groups. Seaport Square is designed to become a multi-generational neighborhood where a diverse array of Bostonians will live, work, play and raise families. Seaport Square will be a neighborhood where interaction, community, collaboration and diversity work hand-in-hand to foster a place where innovation can grow. Seaport Square offers a wide variety of housing options that meet the needs of a diverse workforce. Affordable housing, workforce housing, units for research professionals, garden apartments, condominiums and live-work spaces will all be represented in a range of sizes and a wide mix of price points. Co-working spaces, incubator space, sidewalk cafes, internet cafes, and residential infrastructure to support home offices will all be built into Seaport Square.<sup>2</sup>



Image 26: Seaport Square PDF. Diagrams

<sup>2</sup> Seaport Square PDF. Live. Work. Shop. Play. Stay. Seaport Square in Boston's Innovation District. <http://www.bostonredevelopmentauthority.org>. Page 8.



Image 27 & 28: Seaport Square PDF. Plan view with development outline area and walking distances



Image 29: Seaport Square PDF: Current site condition







Image 31: Seaport Square PDF. Axonometric of proposed Seaport Development Plan [Boston Redevelopment Authority]

## Site Identification



The selected site for the proposed design is located along the Cultural Corridor in the master plan. To represent the artist community as well as providing affordable living the building will replace a residential building in the master plan. The cultural corridor is a major connecting piece that will be infused with the community. It connects the ICA and other major facilities (seen in the diagram to the right). Site L2 will be the site used for the design project.



Image 32: Aerial view of proposed master plan design. The image is provided by the BRA seaport square pdf. Community Meeting January 6, 2010. Page 18-19.





Image 33: Site Plan of proposed B.R.A. site development. The image is provided by the BRA seaport square pdf. Community Meeting January 6, 2010. Page 18-19.

### Site Historic Image

The historic map and image (from 1925) shows the site in its early development.



Image 34: Historic Map 1925. The image is provided by the BRA seaport square pdf. Community Meeting January 6, 2010. Page 18-19.





Image 35: Aerial view of existing site conditions. The image is provided by the BRA seaport square pdf. Community Meeting January 6, 2010. Page 18-19.



## Site Photos



Image 36 & 37: Site Panoramas (Top) Site in foreground (Bottom) Site is to the right. The image is provided by the BRA seaport square pdf. Community Meeting January 6, 2010. Page 22-26.





Image 38: View looking back towards city from site location. The image is provided by the BRA seaport square pdf. Community Meeting January 6, 2010. Page 22-26.

## Site Photos



Image 39: ICA Building (Near site location). The images are provided by the BRA seaport square pdf. Community Meeting January 6, 2010. Page 44&51.





Image 40: Site will be in upper left parking lot (current condition). The images are provided by the BRA seaport square pdf. Community Meeting January 6, 2010. Page 44&51.



## Traffic Patterns

The Images represent nearby structures, demographics, and silver line transportation to site.



### DEMOGRAPHICS

2006 Estimated Population	679,482
2006 Estimated Households	277,249
2006 Estimated AHHI	\$66,357

### PRIMARY TRADE AREA

2006 Estimated Population	679,482
2006 Estimated Households	277,249
2006 Estimated AHHI	\$66,357

### DISTANCE FROM MAJOR MALLS

Faneuil Hall - Boston, MA	.75 mi.
Newbury Street - Boston, MA	1.4 mi.
Copley Place - Boston, MA	1.6 mi.
Prudential Center - Boston, MA	1.75 mi.
CambridgeSide Galleria - Cambridge, MA	1.75 mi.

Image 41: Map locating transportation routes and buildings. BRA seaport square pdf. Community Meeting January 6, 2010. Page 70

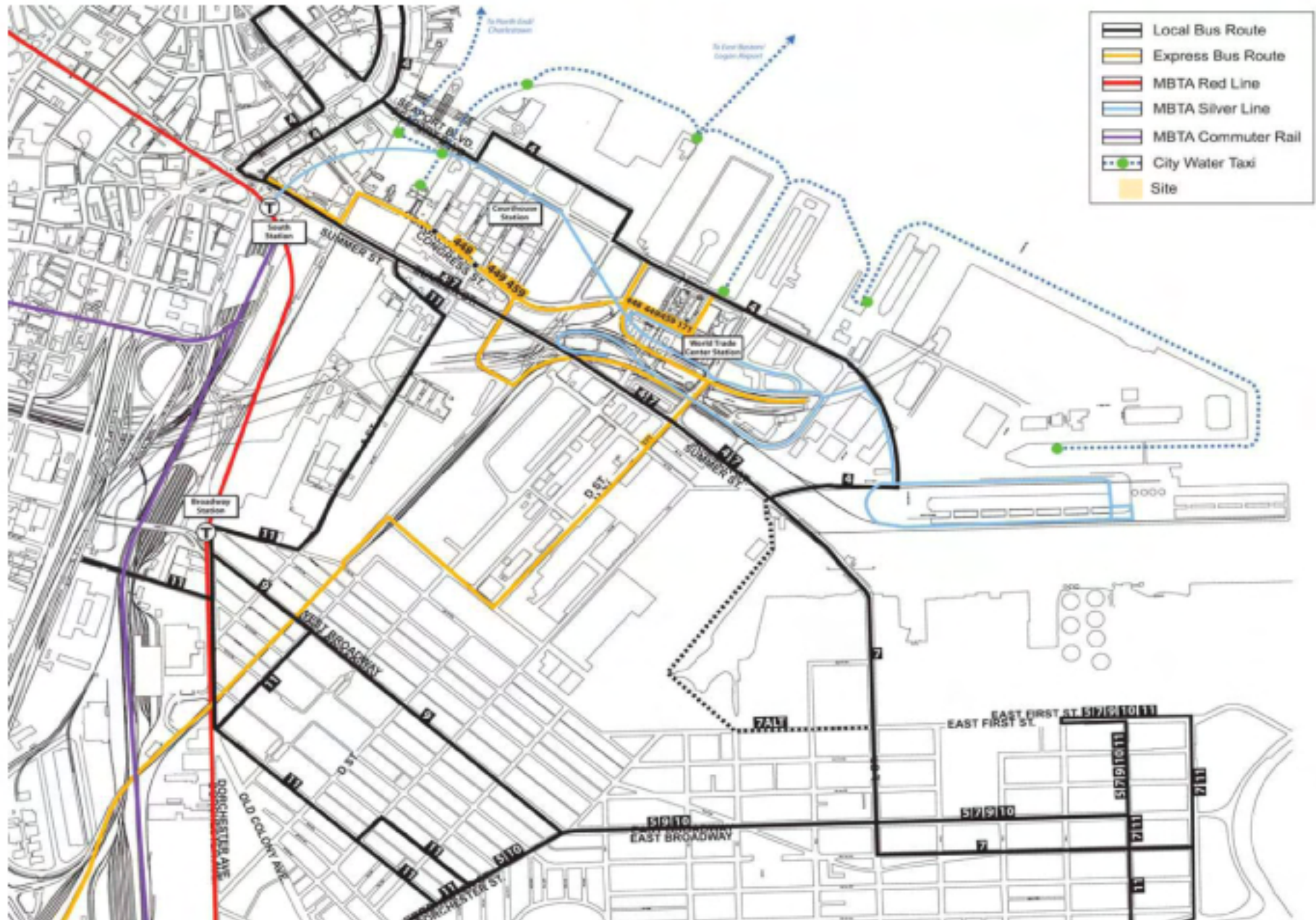


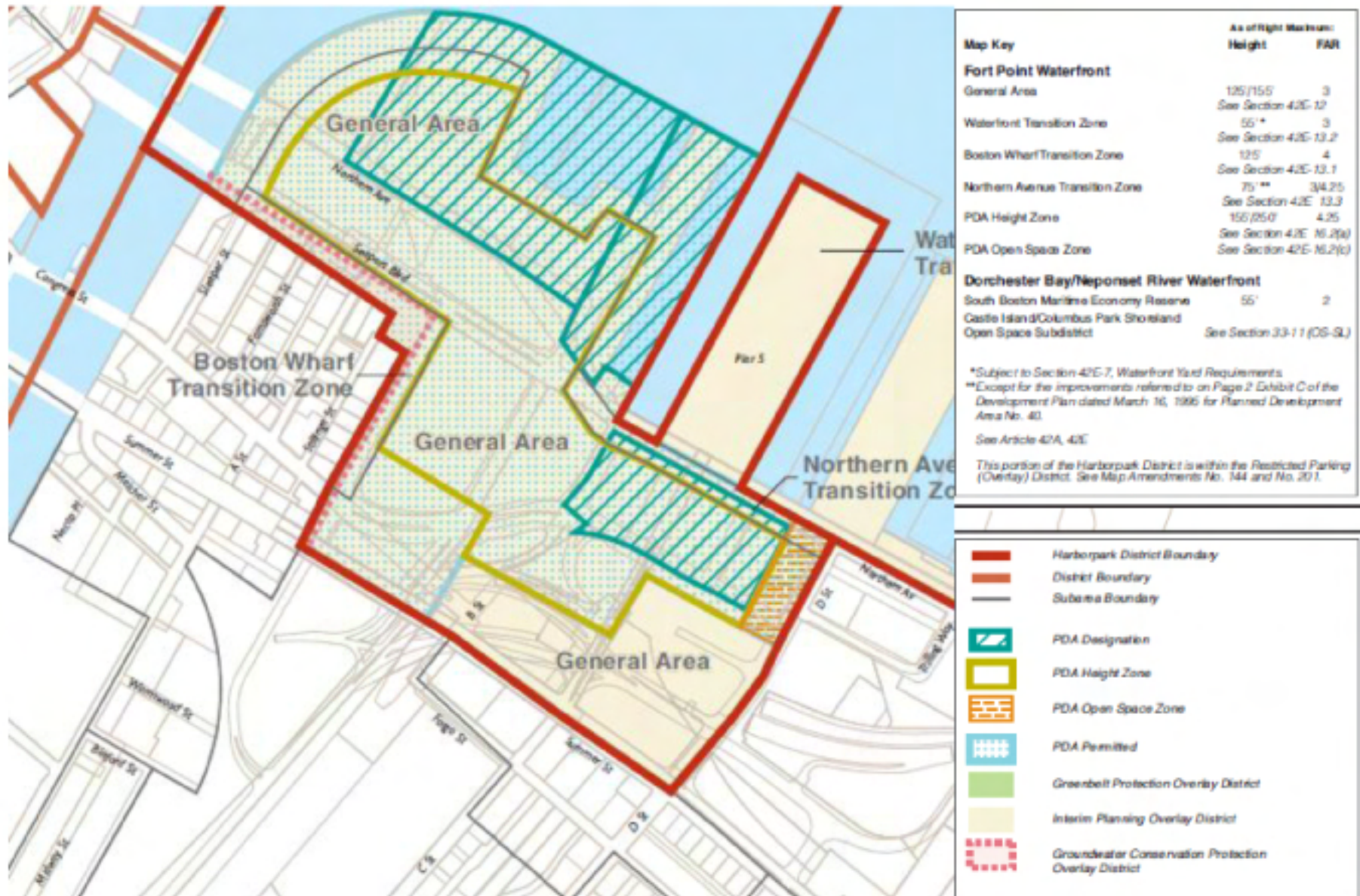
Image 42: Trane Lines beneath the site development. BRA seaport square pdf. Community Meeting January 6, 2010. Page 70



[illegible]

- 56 -





**Image 44:** The PDA height allowance allows for the building on the site to rise to a maximum height of 250'. Boston Redevelopment Authority. [www.bostonredevelopmentauthority.org/pdf/ZoningCode/Maps/4AB\\_FortPoint\\_HBPK.pdf](http://www.bostonredevelopmentauthority.org/pdf/ZoningCode/Maps/4AB_FortPoint_HBPK.pdf).

## Related Code Information

### Roof Construction

An open roof deck may be erected on the main roof of a building with a flat roof or a roof with a slope of less than five degrees providing that (a) such deck is less than one foot above the highest point of such roof; (b) the total height of the building, including such deck, does not exceed the maximum height specified in Table B of Section 13-1 or specified on the zoning maps, the Zoning Districts City of Boston, as they may be amended from time to time; and (c) access is by roof hatch or bulkhead no more than thirty inches in height above such deck unless, after public notice and hearing and subject to Sections 6-2, 6-3 and 6-4, the Board of Appeal grants permission for a stairway headhouse; and (d) an appurtenant hand rail, balustrade, hatch or bulkhead is set back horizontally, one foot for each foot of height of such appurtenant structure, from a roof edge that faces a street more than twenty feet wide.

Roof structures, headhouses, and mechanical equipment normally built above the roof and not designed or used for human occupancy shall be included in measuring the height of a building if the total area of such roof structures, headhouses, and mechanical equipment exceeds in the aggregate: (a) 330 square feet if the total roof area of the building is 3,300 square feet or less; or (b) ten percent (10%) of the total roof area of the building if such total roof area is greater than 3,300 square feet.

### Applicable Information

1. "Adjusted Income" is defined as it is in 24 CFR 813.102, as amended, or as set forth in regulations adopted in accordance with Subsections 42E-5.
2. "Affordable" means, in the case of an owner-occupied dwelling unit, requiring the expenditure by a Low-Income, Moderate-Income, or Upper Moderate-Income Household for mortgage and insurance payments, real estate taxes, and condominium fees of not more than thirty percent (30%) of its Adjusted Income to occupy the unit, and, in the case of a renteroccupied dwelling unit, requiring the expenditure by a Low-Income or Moderate-Income Household or Upper-Moderate Income Household for rent payments of not more than thirty percent (30%) of its Adjusted Income to occupy the unit.
3. "Annual Income" is defined as it is in 24 CFR 813.106, as amended, or as set forth in regulations adopted in accordance with Subsections 42E-5.
4. "Applicant" means any person or entity having a legal or equitable interest in a Proposed Project subject to the provisions of this article, as set forth in Section 42E-4 or the authorized agent of any such person or entity.
5. "Art use" means the creation, manufacture, or assemblage of visual art, including two- or three-dimensional works of fine art or craft, or other fine art objects created, manufactured, or assembled for the purpose of sale, display, commission, consignment, or trade by artists or artisans; or classes held for art instruction.
6. "Artists' mixed-use" means the use of all or a portion of a building for both art use and habitation.
7. "Boat Rental Establishment"<sup>1</sup>

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<sup>1</sup>Boston Redevelopment Authority. Codes and Ordinances. [www.bostonredevelopmentauthority.org/pdf/ZoningCode/Article42E](http://www.bostonredevelopmentauthority.org/pdf/ZoningCode/Article42E)





PROGRAM ELEMENT		Square FT	#	Total
<b>LOBBY AND PUBLIC INTERACTION ZONE</b>				
Level One	Public Market	8,000 sq. ft	1	8,000 sq. ft
	Public Seating	10,000 sq. ft	1	10,000 sq. ft
	Circulation/Entry	8,400 sq. ft	1	8,400 sq. ft
	Outdoor Market	2,000 sq. ft	2	N/A [outdoor]
Level Two	Kitchen/Service	3,000 sq. ft	1	3,000 sq. ft
	Seating/Dining	15,000 sq. ft	1	15,000 sq. ft
	Circulation	8,400 sq. ft	1	8,400 sq. ft
Level Three (double height space)	Public Gathering	6,000 sq. ft	1	6,000 sq. ft
	Plant Exhibition	17,000 sq. ft	1	15,000 sq. ft
	Circulation	6,000 sq. ft	1	6,000 sq. ft
[total square footage of lobby and public zone/floors 1-4] <b>SUBTOTAL ONE</b>				79,800 sq.ft
<b>AGRICULTURE AND RESIDENTIAL ZONE</b>				
Level One	Greenhouse Farm	22,000 sq. ft	1	22,000 sq. ft
	Mechanized Farm	12,000 sq. ft	1	14,000 sq. ft
	Storage Area	1,300 sq. ft	1	1,300 sq. ft
	Circulation	600 sq. ft	2	1,200 sq. ft
Level Two	Residential type 1	850 sq. ft	6	5,100 sq. ft
	Residential type 2	1,000 sq. ft	5	5,000 sq. ft
	Resident's Garden	2,400 sq. ft	1	2,400 sq. ft
	Outdoor Growing	2,000 sq. ft	2	N/A [outdoor]
	Circulation	3,000 sq. ft	1	3,000 sq. ft
Level Three and Four	Residential type 3	1,800 sq. ft	7	12,600 sq. ft
	Residential type 4	1,500 sq. ft	4	6,000 sq. ft
	Resident's Garden	1,800 sq. ft	1	1,800 sq. ft
	Outdoor Growing	2,000 sq. ft	4	N/A [outdoor]
	Circulation	4,500 sq. ft	1	4,500 sq. ft
[total square footage of agriculture and residential/floors 5-8] <b>SUBTOTAL TWO</b>				78,900 sq. ft
[there are 4 agriculture and residential zones/subtotal two x 4] <b>SUBTOTAL THREE</b>				315,600 sq. ft
[total building square footage/subtotal 1 plus subtotal 3] <b>TOTAL SQUARE FOOTAGE</b>				395,400 sq. ft





## Final Design

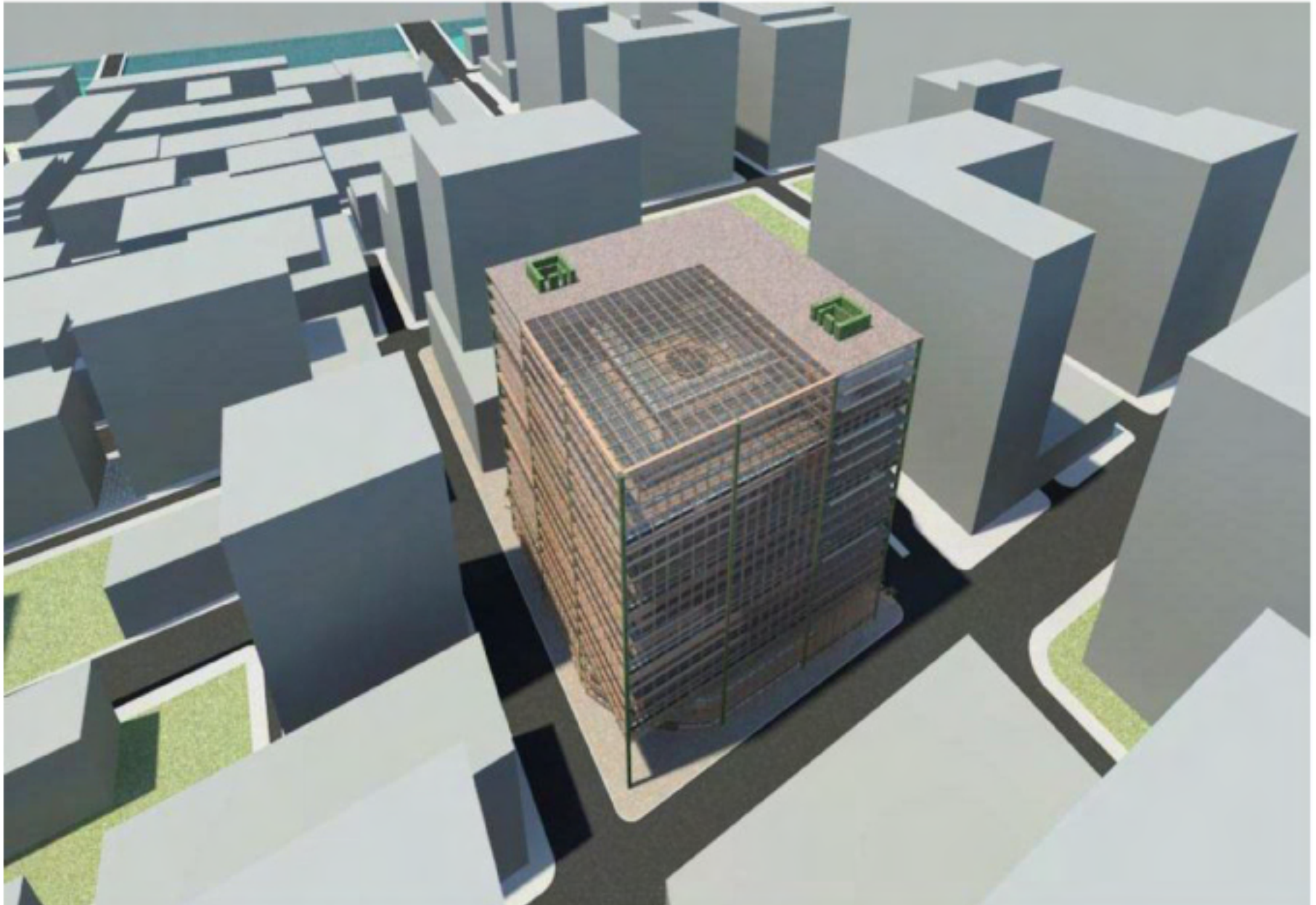


Image 45: Aerial view of Greenhouse on Southern corner of structure with 'L' shape housing in final design scheme. [Autodesk Revit 2011 Render]

## Site Strategies & Overall Scheme

The selected site is part of the Boston Redevelopments Authority's master plan for the Seaport District of Boston, MA. Seaport Boulevard is the primary traffic route and main access point to the building. However, the site was selected in large part because of its location along the proposed cultural corridor which is a path/ramp that connects the ICA building to the Boston Convention Center [can be seen on the right]. Outdoor market spaces are located adjacent to each pedestrian path (Seaport Boulevard and Cultural Corridor), in order to create a visual connection to the open public market located on the lower levels of the designs public component.



Image 46: B.R.A.'s Redevelopment Plan [Seaport PDF, Jan. 2006]



Image 47: ICA to Convention Center Diagram [Google Map and Photoshop]





Image 48: View along Cultural Corridor with outdoor market and projecting community space to left. [Created using Revit and Photoshop]



As stated previously the **site** was selected to be placed along the cultural corridor; however other prominent locations around the site influenced entrance and approach strategies. The primary entrances for residents of the building are located on the circulation corners [fire stairs/elevators] of the building, while the public entrances are located on the corner directed to Seaport Square Park and along the outdoor market spaces. Primary approaches to the site are from **train stop at Seaport Square Park** and **residential developments** south of site.



Image 49: 3D View from South [Created using Revit and Photoshop]



Image 50: Site Plan: Approach and Entry Diagram [Created using AutoCAD and Photoshop]

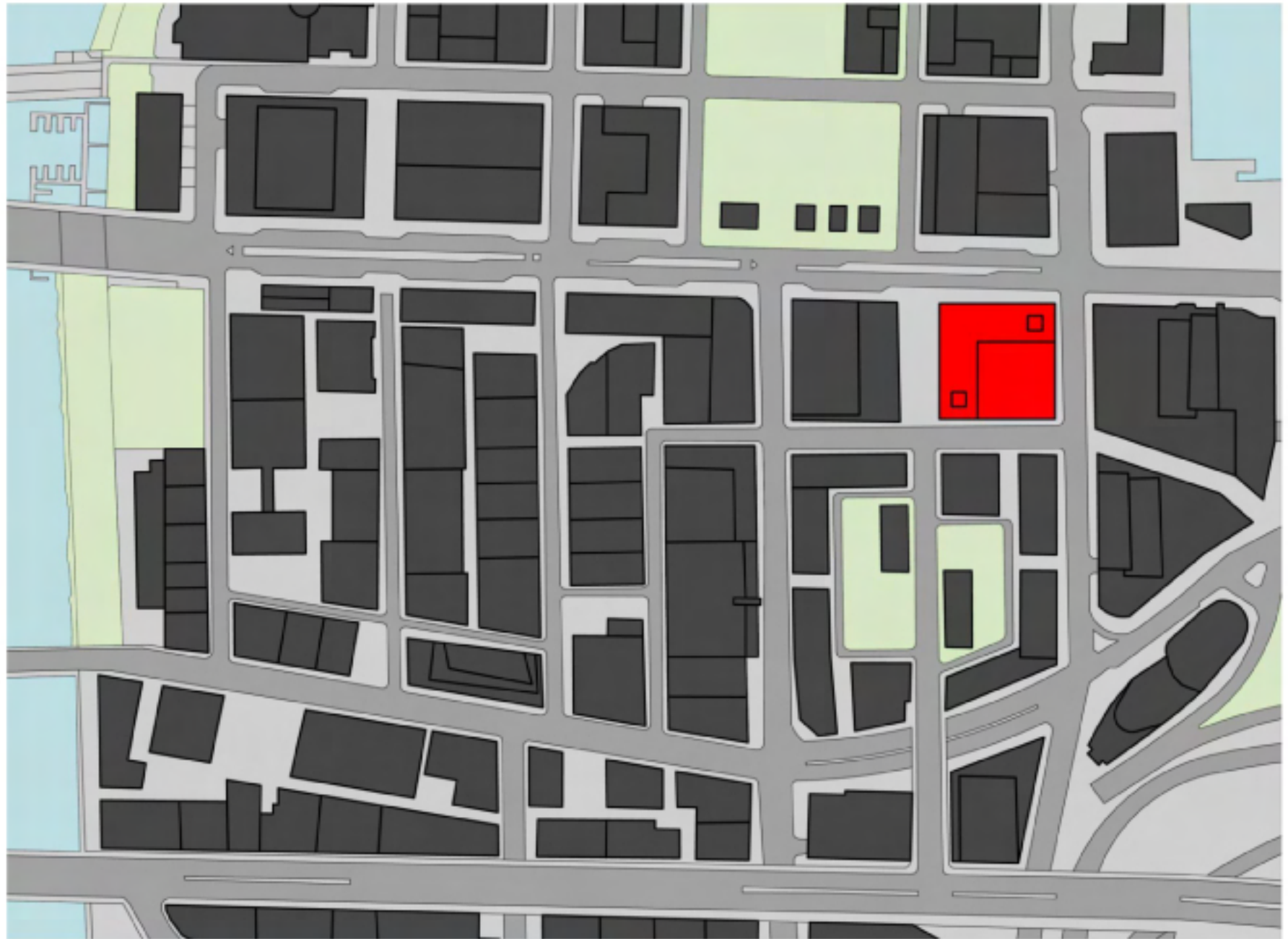


Image 51: Site Plan which includes Seaport Development Plan [Created using AutoCAD]



The function of the building was the leading factor in the design parti. **Vertical farming** requires the optimal amount of natural sunlight as possible to reduce costs in artificial lighting. In response to this, the vertical farming program in the design is located on the southern corner with the 'L' shape of residential units to the north. To create public awareness and to include the outside community within the design the **first four floors are primarily public**. The focal point of the public program is an interior market surrounded by a ramp leading to various cafes/lounges and ultimately a public gathering space. Community through vertical farming is the result of combining vertical farming and residential units. Produce that is grown within the agricultural zones of the design is not only for the residents who grow it, but a source of wellness for the surrounding community. The following series of rendering and aerial views show the approach and design within its context; before continuing into the interior of the project.

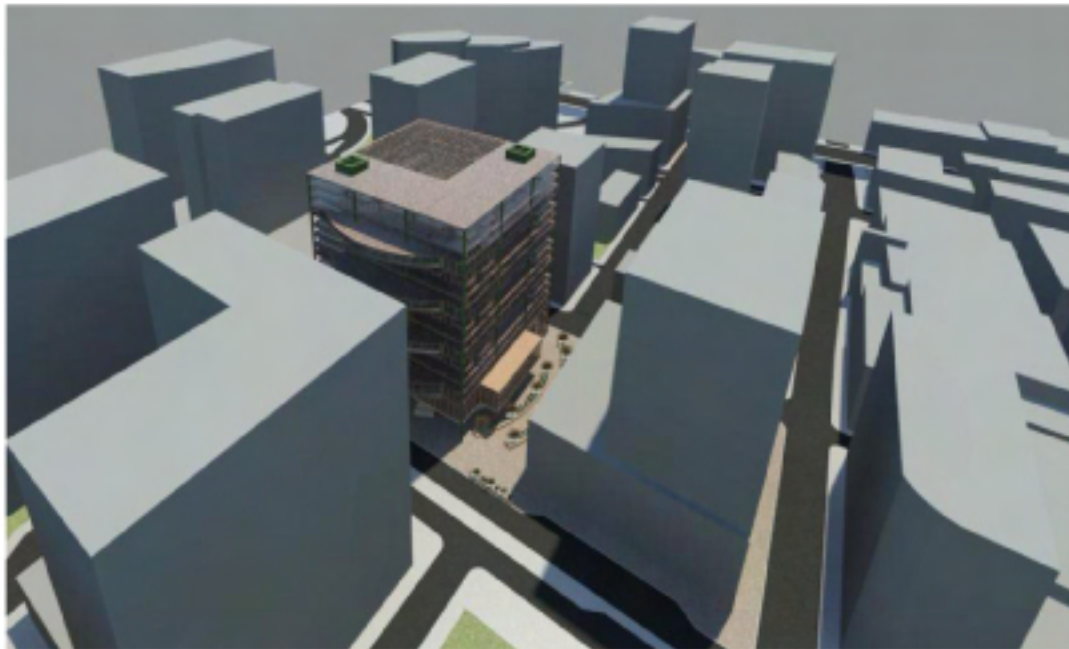
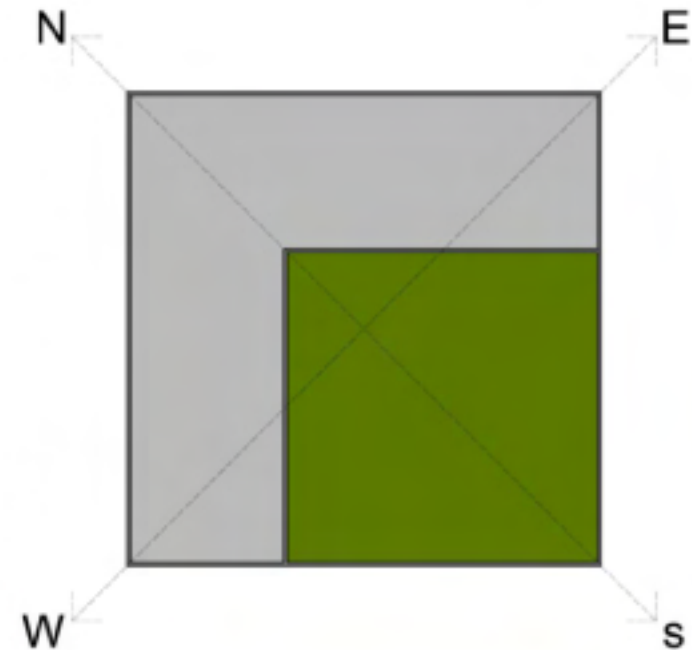


Image 52: 3D View from North; above Seaport Square Park [Created using Revit]



Image 53: Plan/Section Diagram of Parti. Program layout.





Image 54: 3D View from North; Corner Seaport Square Park [Created using Revit]



Image 55: 3D View from East; Along Seaport Boulevard [Created using Revit]



Image 56: 3D View from South; Corner of Agriculture/Rear Entry [Created using Revit]

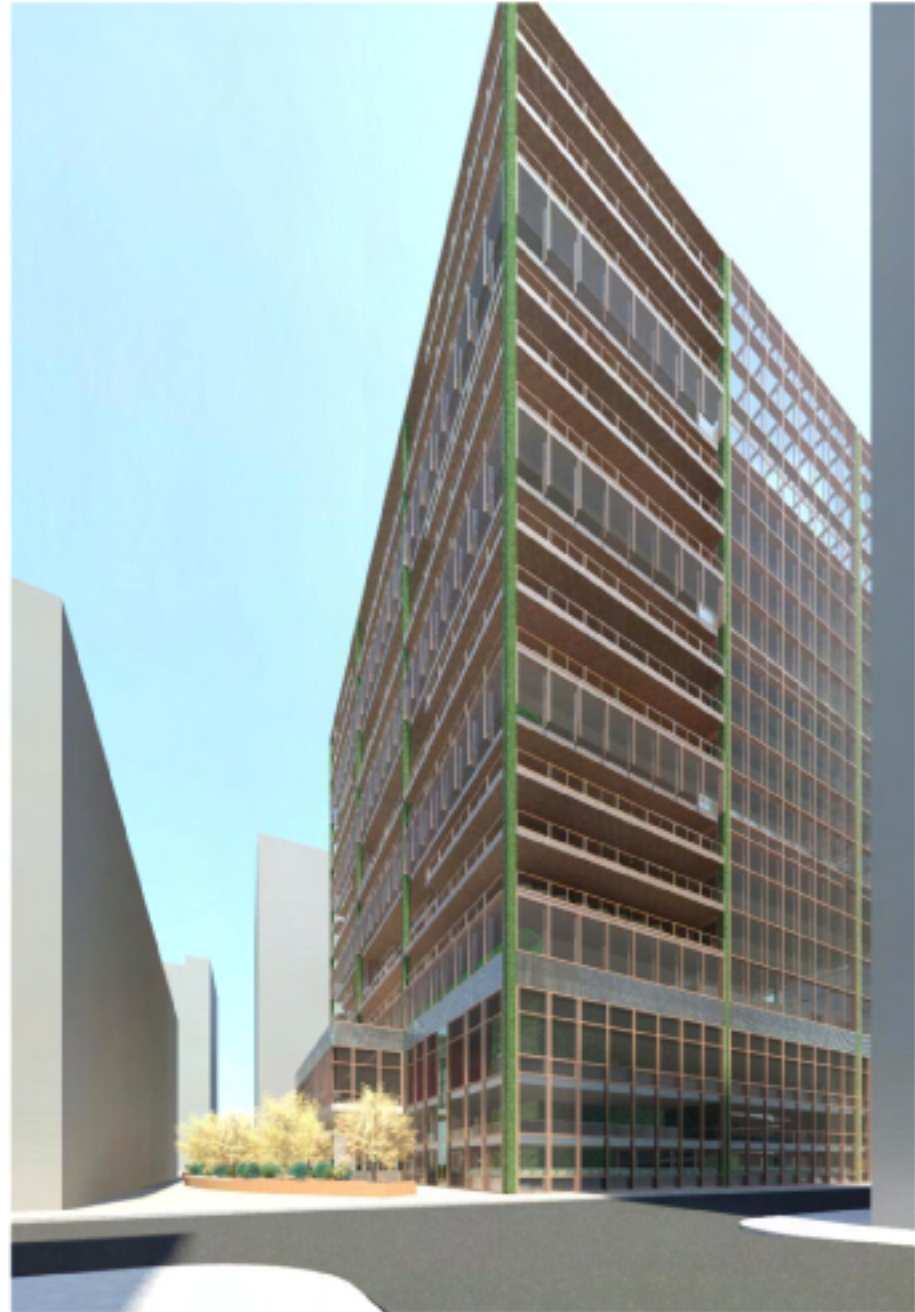


Image 57: 3D View from West; Entry to Cultural Corridor from residential zone [Revit]





Image 58: 3D View walking long Seaport Boulevard towards main entry; directly across from Seaport Square Park. Cultural Corridor entry to the right. [Created using Revit]



## Entering the Design Project [floor plans and interior renderings]



Image 59: 3D View of covered, main public entrance; to the right is cultural corridor and to the left in outdoor market shelves which wrap around to far right [Created using Revit]



Image 60: 3D View of covered, rear public entrance; to the left is residential housing zone and entry doors are on Southern corner of design. [Created using Revit and Photoshop]



The Ground floor plan of the design focuses on the public interaction within the structure. Diagonally across from Seaport Square Park is the **main public entrance** which is placed in the middle of an **outdoor market**. **Residents** of the building have their own **entrance** to the circulation cores of the building, while the public can use the stairs/elevator in the **entrance vestibule** or ramp throughout the lower floors. The focal point of the interior is a **public market**, where the vegetables and fruits grown above are sold to the public and surrounding community. Along the edges of the exterior glazing are aquaponic planters, the same used above the visitors to grow produce, to allow the public to see how the process works. The system that is being used consists of stainless steel basins filled with water, porous trays that rest on top of the water, soilless plants (whose roots sit in the nutrient filled water), and tilapia fish that swim below to clean/fertilize water. Also on the first level is a **lounge**, where people can meet/interact or even sit down and eat some of the fresh fruits and vegetables from the market.

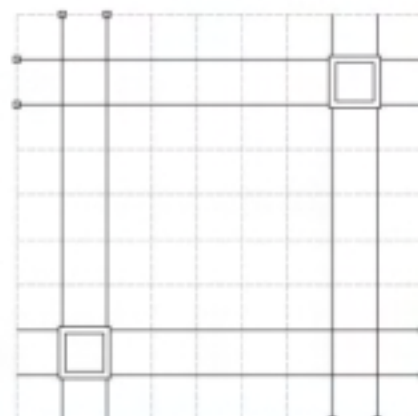
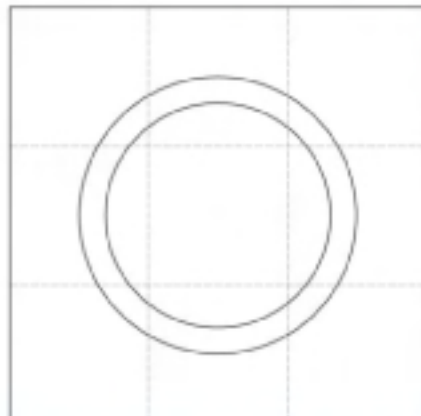
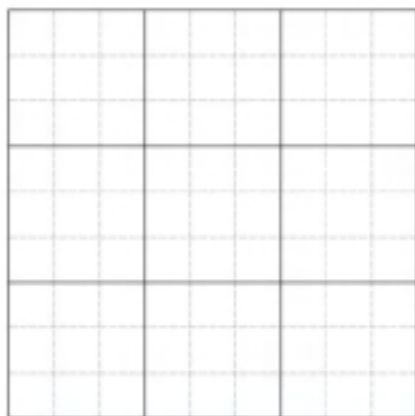
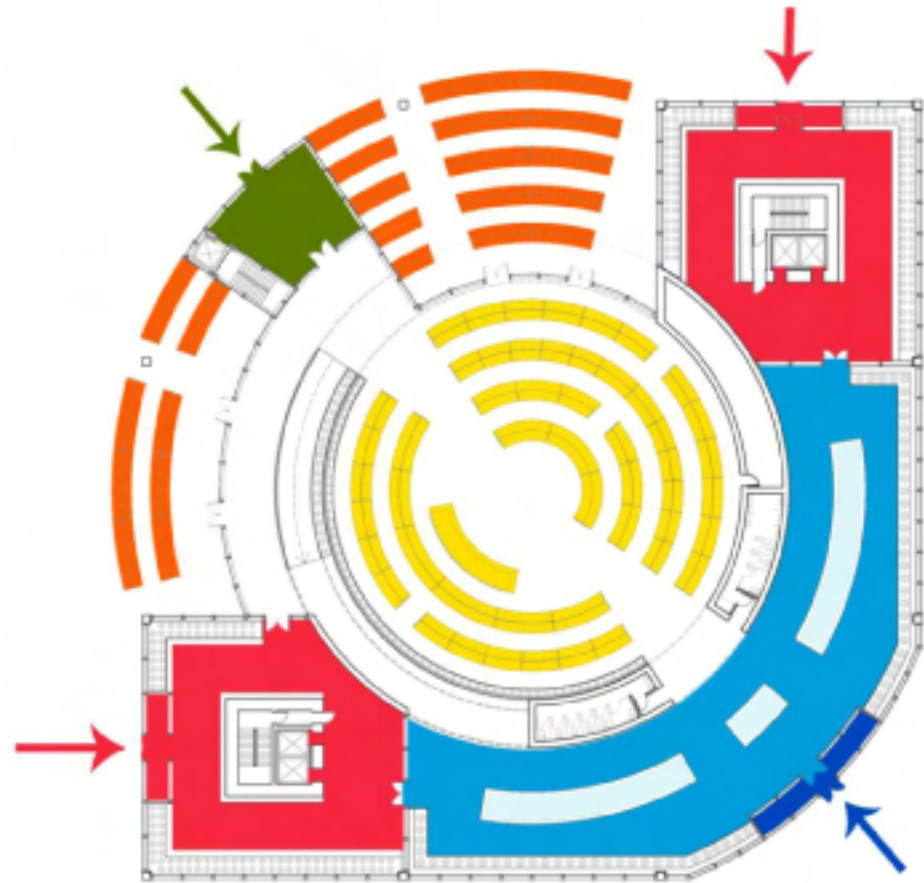


Image 61: The Diagrams represent the 9 square grid used for structure and spatial planning. Circle represents ramp area. Circulation diagram to the right [AutoCAD and Photoshop]



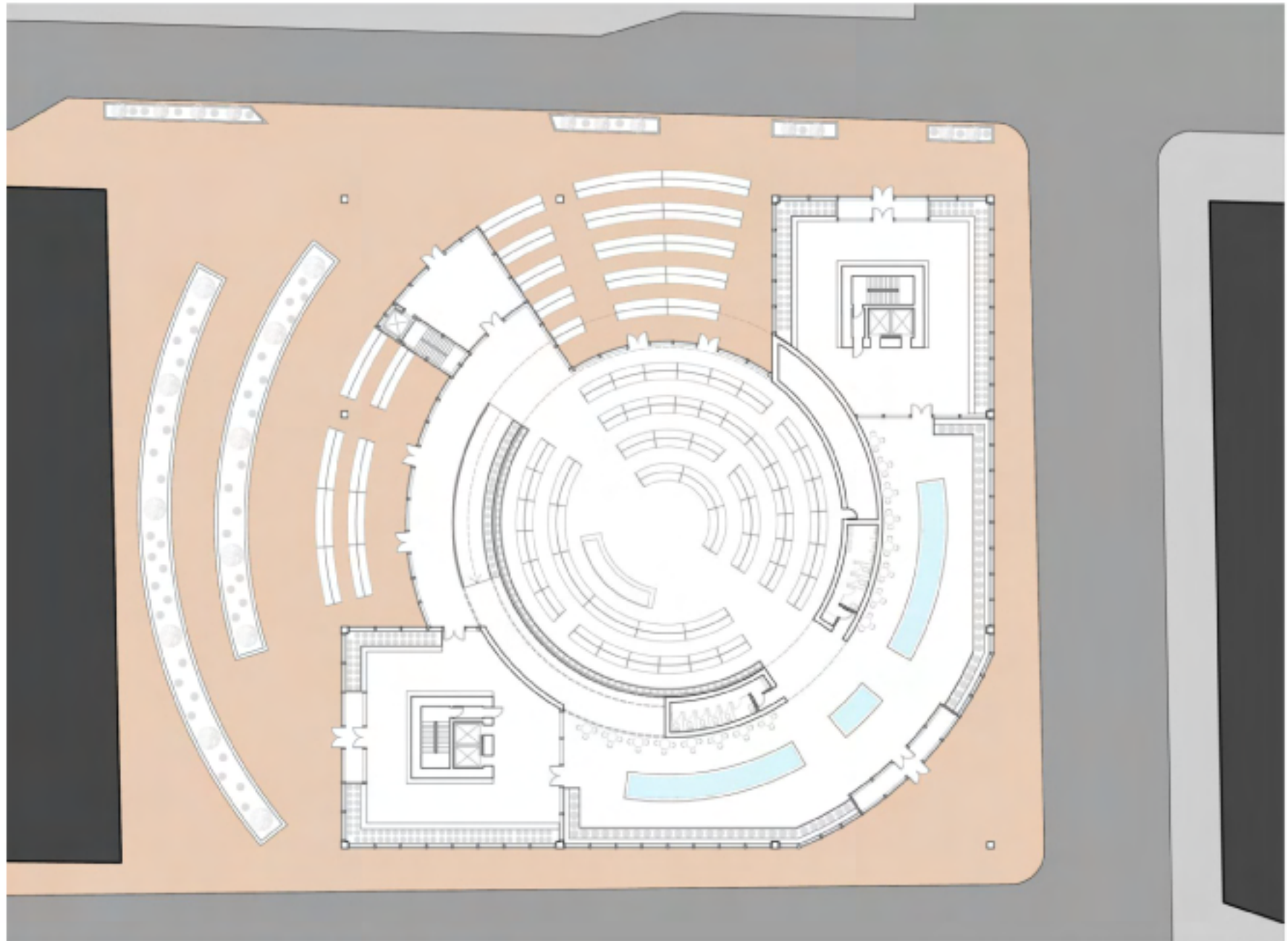


Image 62: Ground Floor Plan [Created using AutoCAD and Photoshop]





Image 63: 3D view of exterior market from Seaport Boulevard. [Revit and Photoshop]





Image 64: 3D view of exterior market heading toward public entrance. [Revit and Photoshop]





Image 65: 3D view of interior market from public entrance. Ramp to right and surrounding lounges/café to the exteriors. Skylight to interior agriculture above [Revit and Photoshop]



Image 66: 3D view of ramp leading up to café/lounge and ultimately the community gathering space. [Revit and Photoshop]





Image 67: 3D view of seating on the ground floor, where people can gather/meet or sit down to eat/relax. [Revit and Photoshop]





Image 68: 3D view of ground level meeting space with water and visual connection to upper levels. [Revit and Photoshop]

The second floor's primary function is for interaction between members of the community. Located on this level are public services such as a **kitchen/café** and **restrooms**. Along the perimeter of the design is **seating for visitors and residents** to use as meeting and or relaxation space. Views down to the **indoor** and outdoor **markets** are available to each person sitting along the perimeters. Once again the display of planting is evident along the ramp, which connects the ground level market to level two.

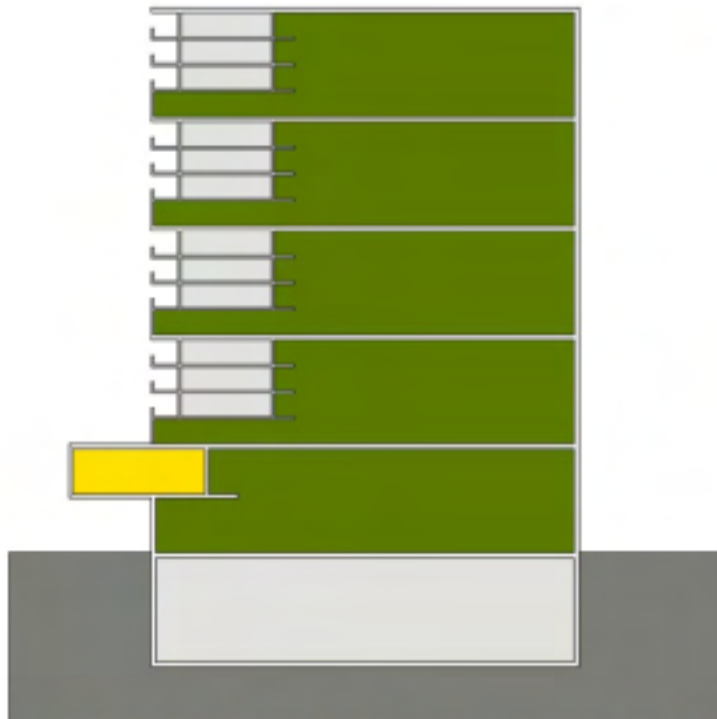


Image 69: Section diagram showing public gathering space [yellow]

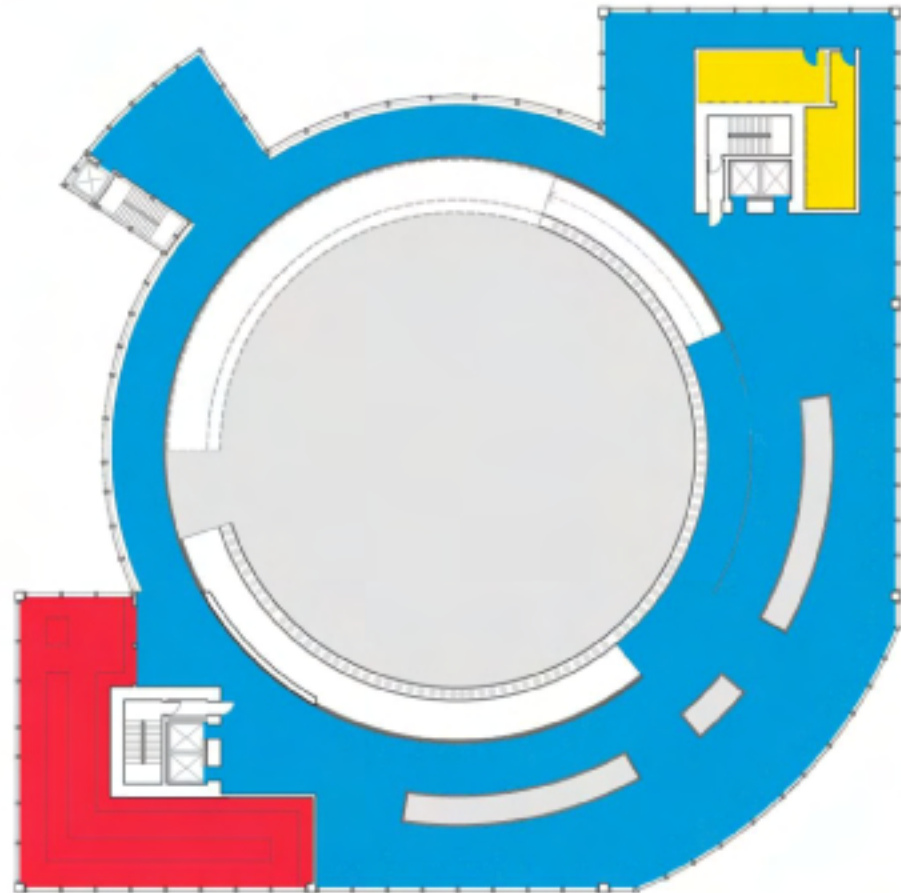


Image 70: Aerial view with site in context [Revit]. Above is plan key for floor plan two.

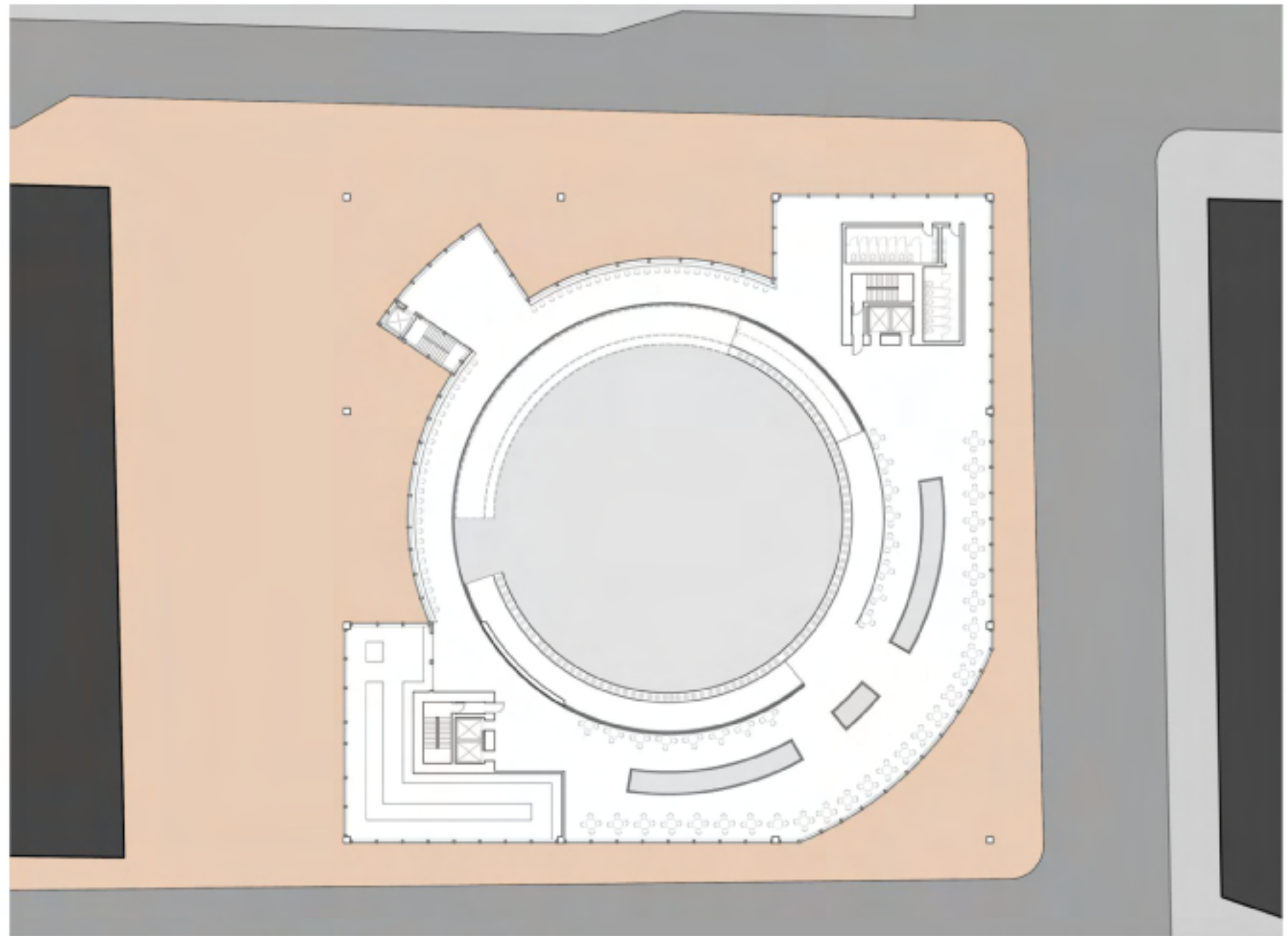


Image 71: Second Floor Plan [Created using AutoCAD and Photoshop]





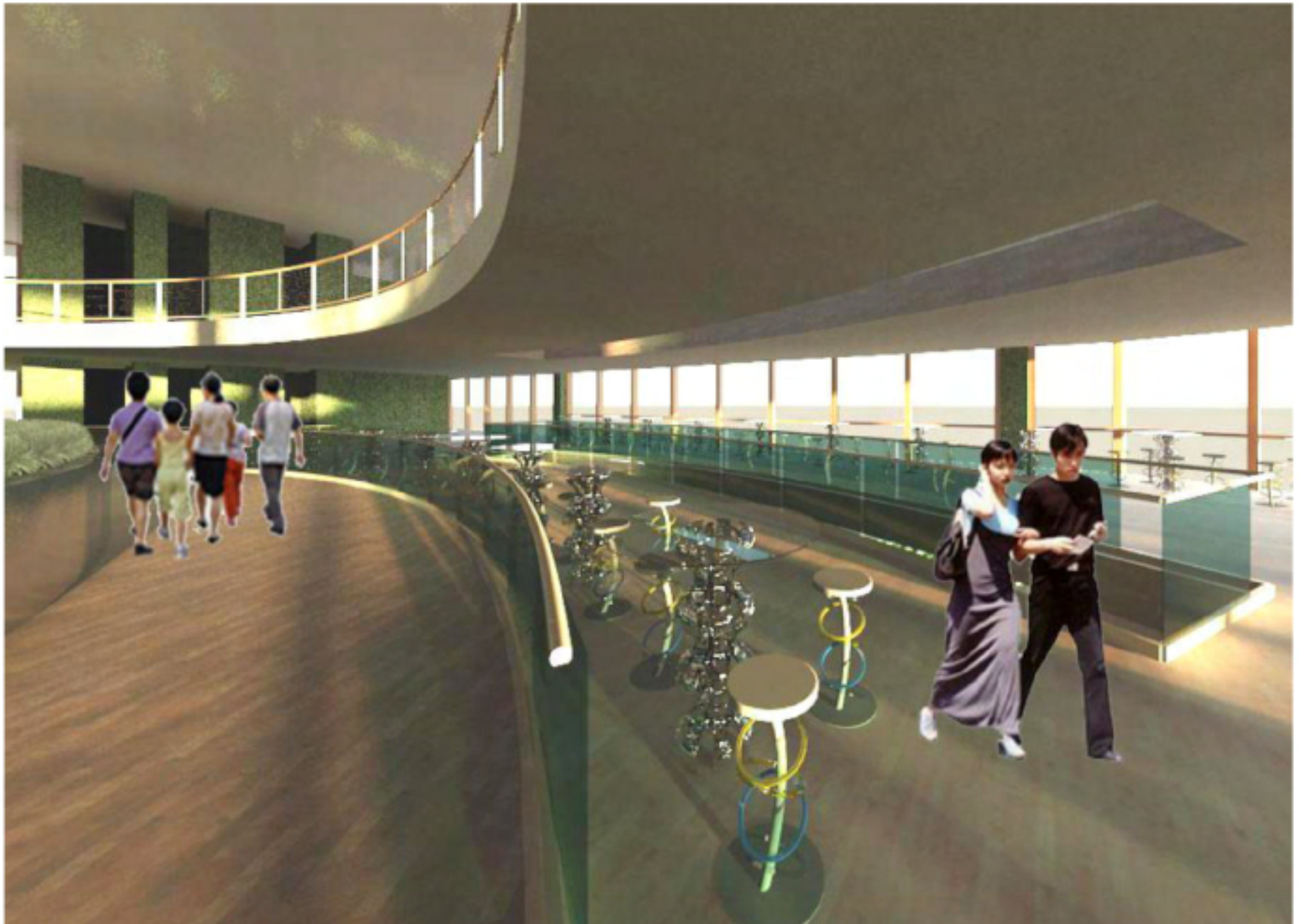


Image72: 3D view of second level lounge and ramp leading up to level three community meeting space. [Revit and Photoshop]

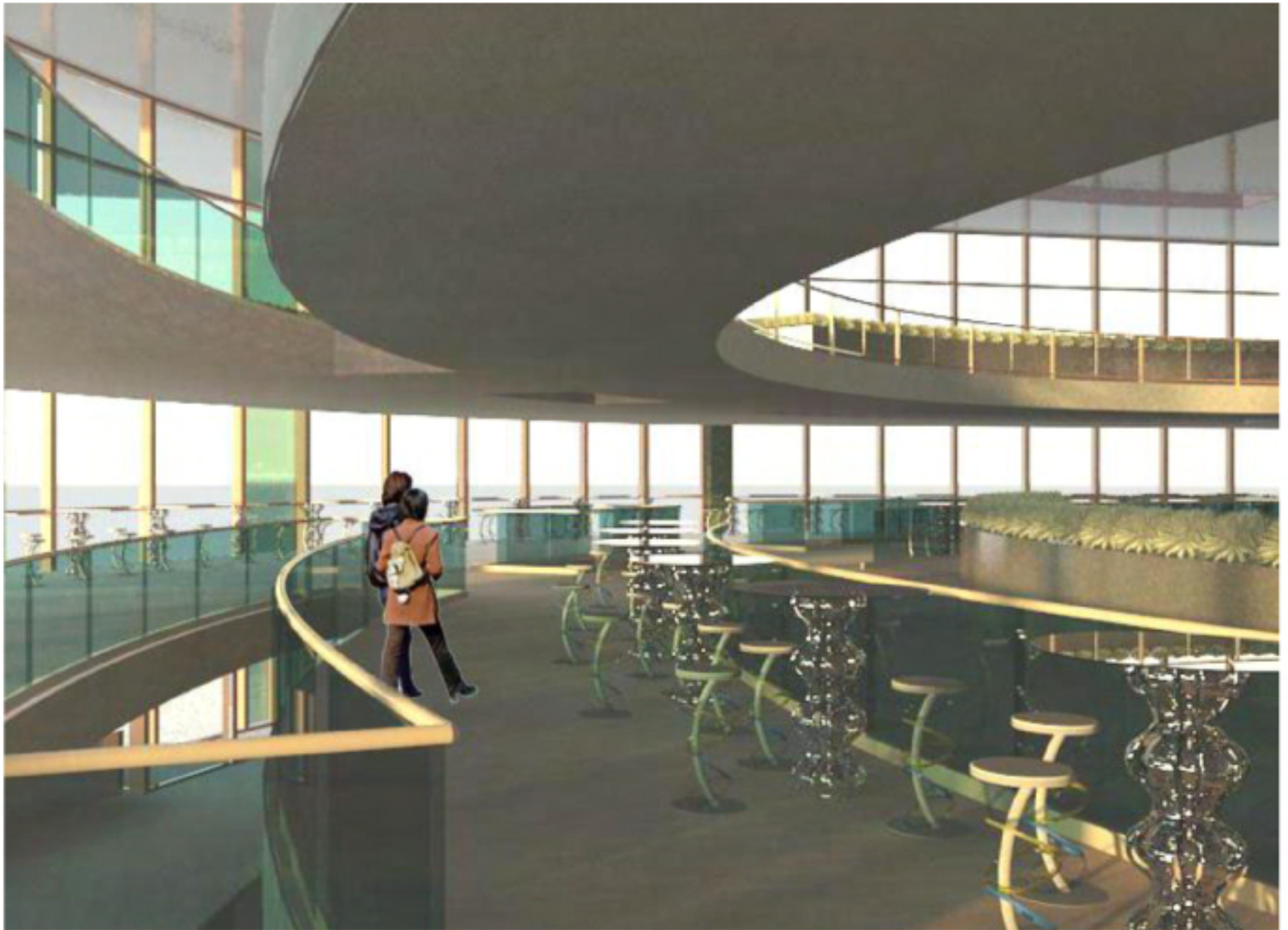


Image 73: 3D view of second level lounge with visual connections to ground level and level three above. [Revit and Photoshop]



The third floor contains the **community meeting** space at the top of the ramp. In addition to that the overspill space is used to extensively showcase the **aquaponic growing system**. The **lounge/lobby area** provided provides views to Seaport Square Park, the neighboring residential development, and allows visitors to the building to interact with the agriculture systems. **Public restrooms** are also provided and this is the floor where the public stair and elevator stop [adjacent to the community meeting space]. This floor is also double height to allow for increased lighting to penetrate ground floor market and to provide space for drop ceiling/mechanical.

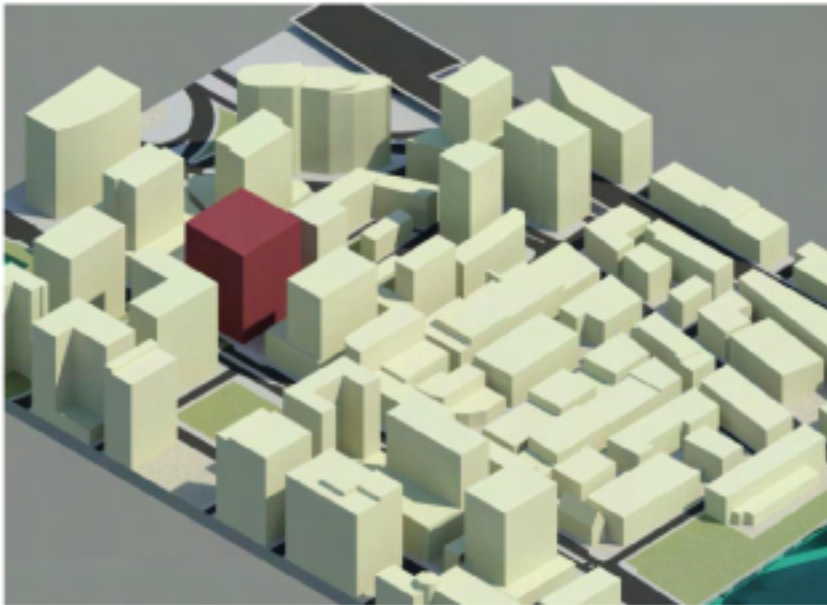


Image 74: Aerial view of site in context [Revit and Photoshop]



Image 75: Sun diagram of the site at noon of June 21 [Revit]



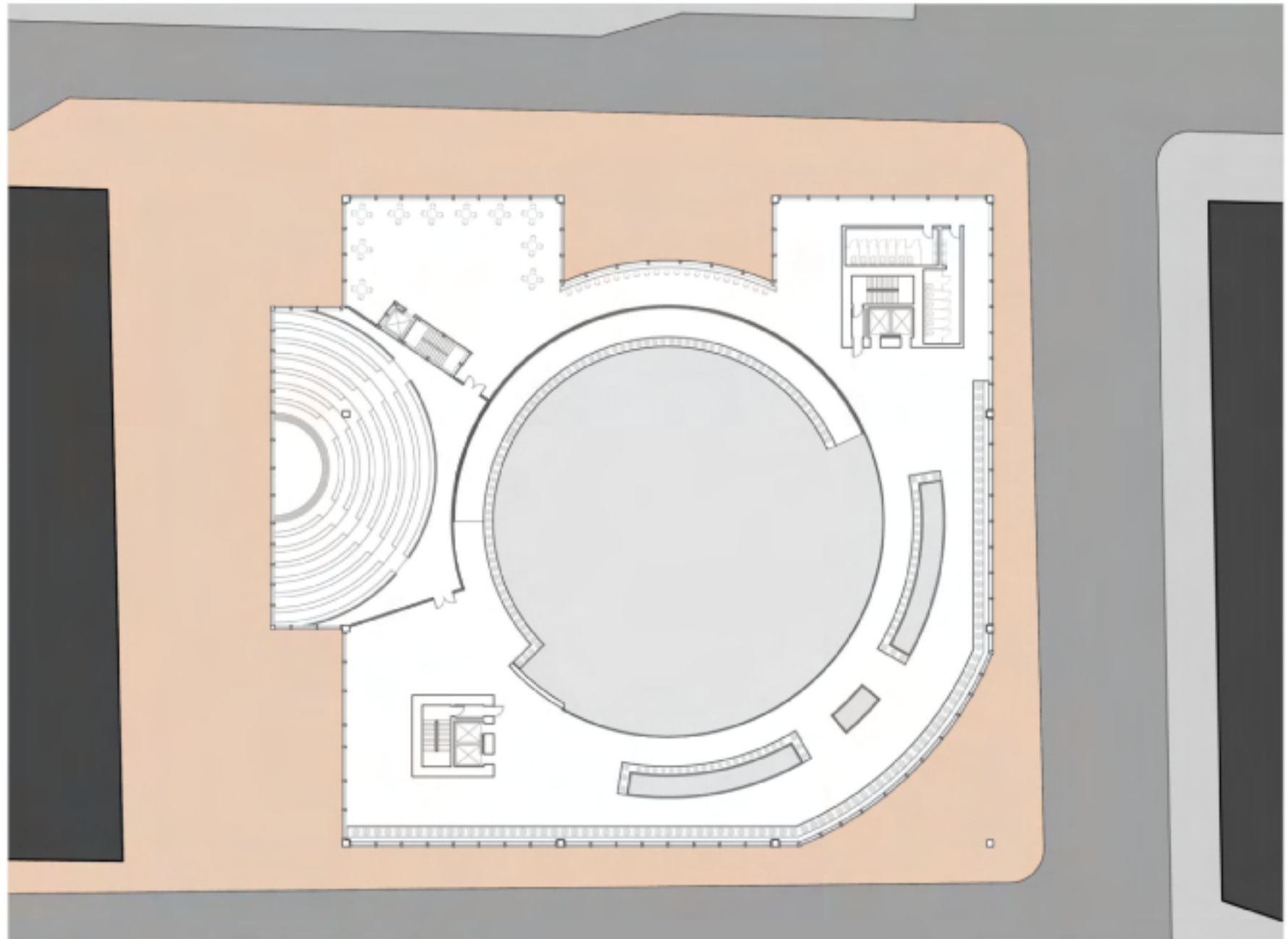


Image 76: Third Floor Plan [Created using AutoCAD and Photoshop]





Image 77: 3D view from third level looking down upon the market space on the ground floor. [Revit and Photoshop]



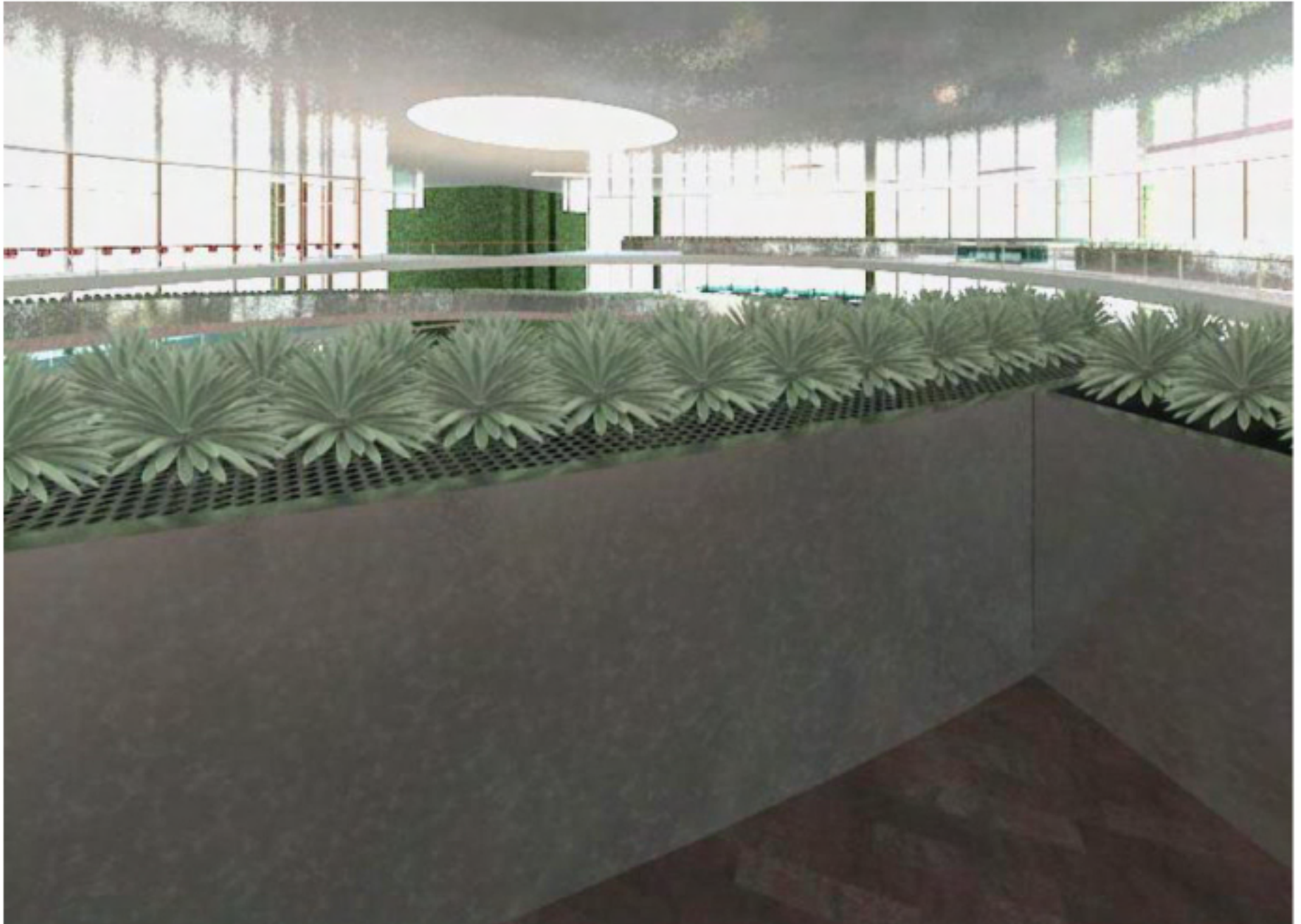


Image 78: 3D view from top of the ramp looking across the 3 level market space. Entrance into the community meeting space is behind view point. [Revit and Photoshop]





Image 78A: Community gathering space from the back of the seating area. Hanging acoustical and shading panels hung from steel/glass structure. [Revit and Photoshop]





Image 788: Community gathering space. Windows behind the stage/screen look out onto the exterior cultural corridor. [Revit and Photoshop]



This is the agricultural zone where food is produced for the market below. To the bottom right are **aquaponic trays** placed in optimal lighting (southern corner) reducing lighting costs. Northeast projection catches indirect light where plants requiring lower lighting levels can be grown. On the far left portion of the plan are **hydroponic wheels**, which are cylinders where plants are grown with lighting on the interior requiring no exterior light. **Storage** is also provided.

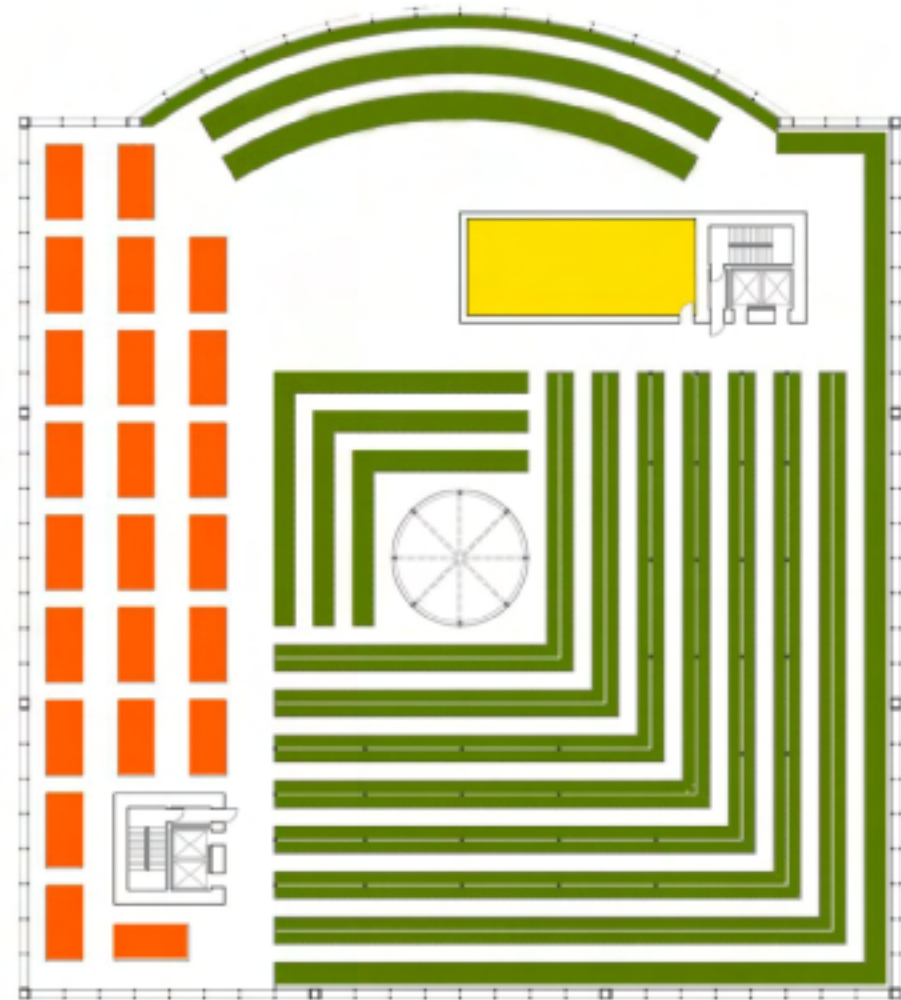
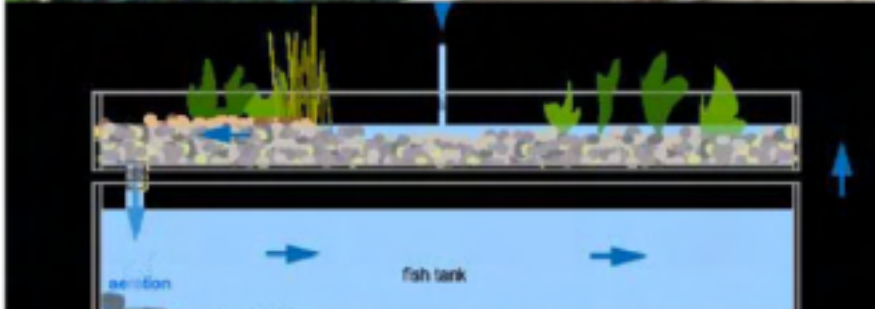


Image 79A : Diagram of aquaponic system. (1) Trays (2) Stainless Steel tank (3) Tilapia fish is water. To the right are inside of carousel wheels. [Carousel Design Systems]



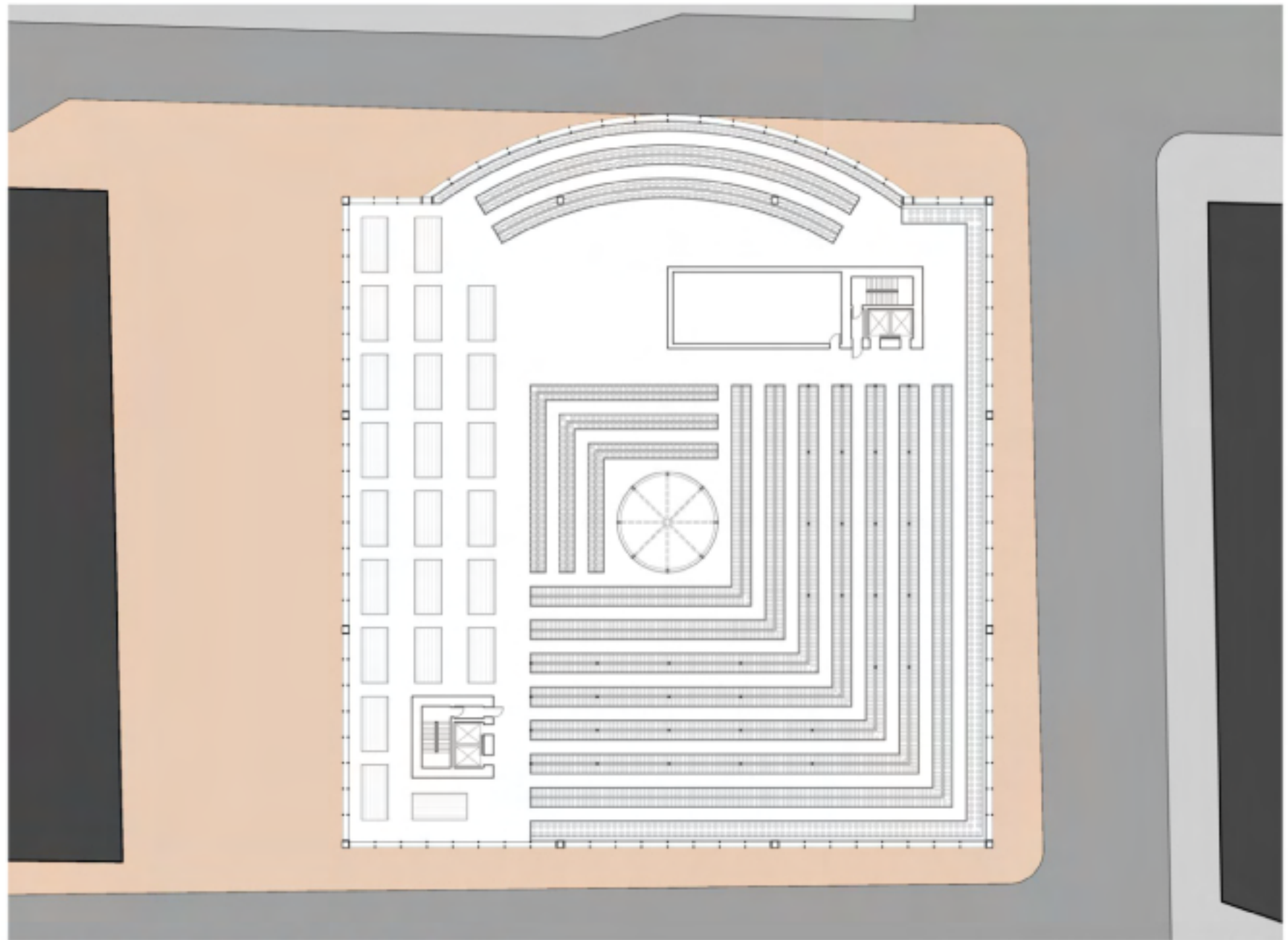


Image 79B: Fifth Floor Plan [Created using AutoCAD and Photoshop]





Image80 : 3D view in the outer row of the agriculture zone. This is where the food for the market is produced. The levels [cat walks] above are for residents. [Revit and Photoshop]





Image 81: View in the central part of agricultural zone. In the distance are windows to apartments and to the right is the skylight from the ground floor market [Revit and Photoshop]



The sixth floor is the beginning of the **residential units** which are arranged in an "L" shape. These units are one level flats and range from one to two bedroom units. Each unit has an **exterior terrace** which connects to the main living space. On the corners of the building (exteriors) are **outdoor growing areas** that receive southeast and southwest sunlight. An "L" shape walkway is used **for residents to grow crops** and area is designated for **seating and gathering space**, overlooking the agriculture zone.

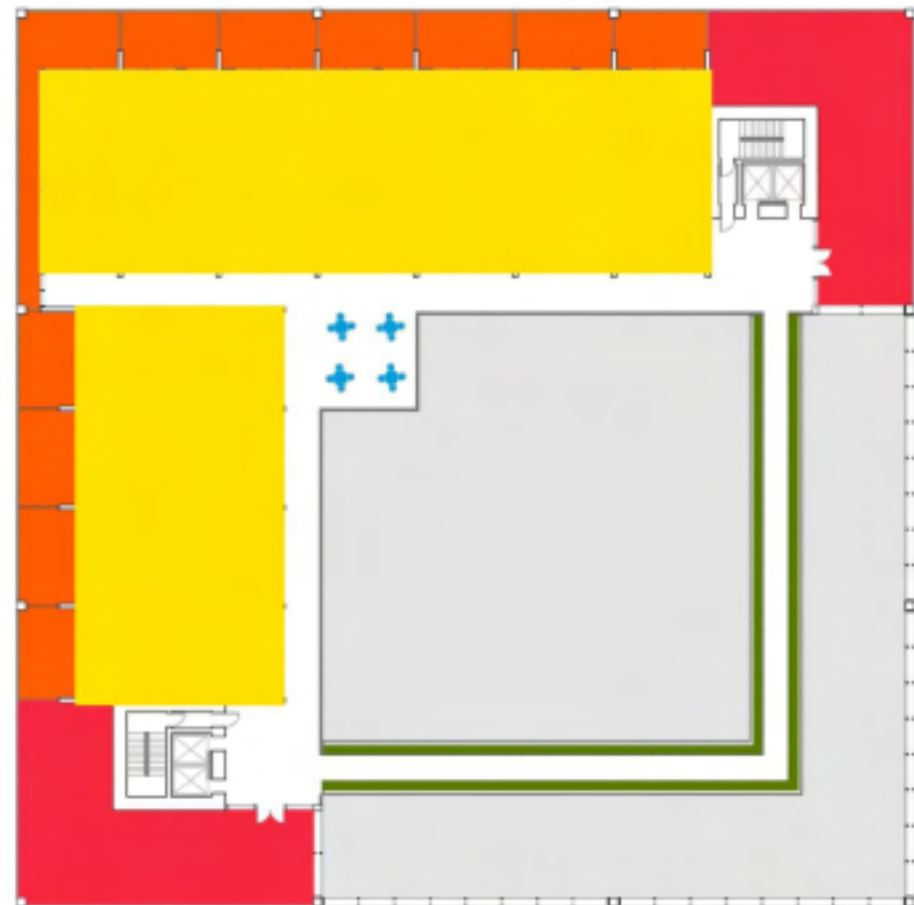
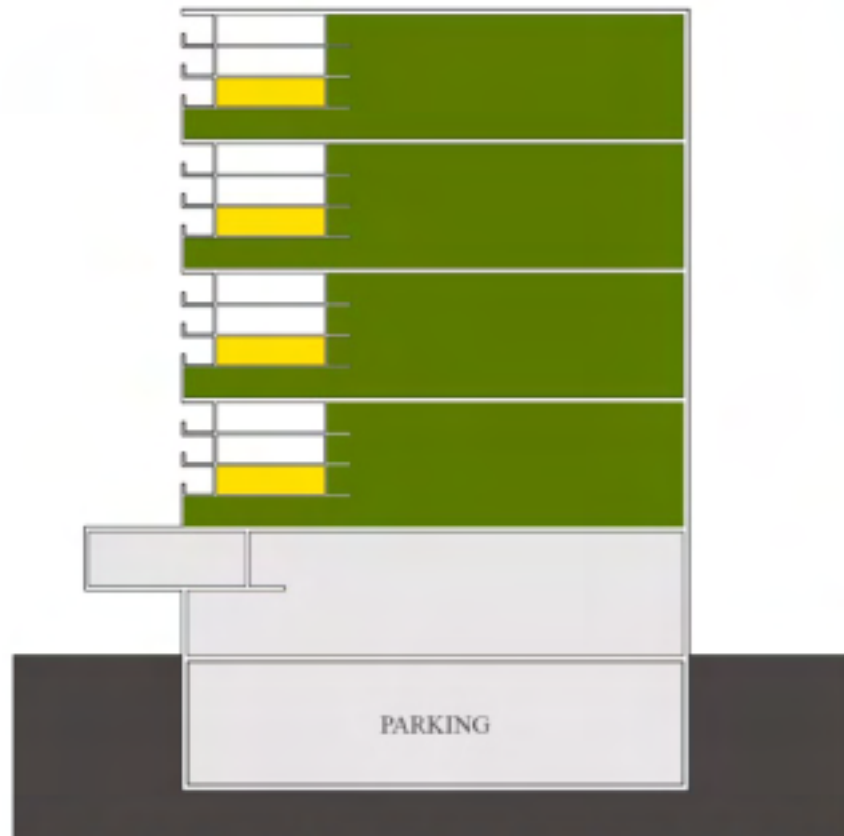


Image 82: To the left is a building section locating floor plate levels and to the right is the site situated within its context. [AutoCAD, Revit and Photoshop]

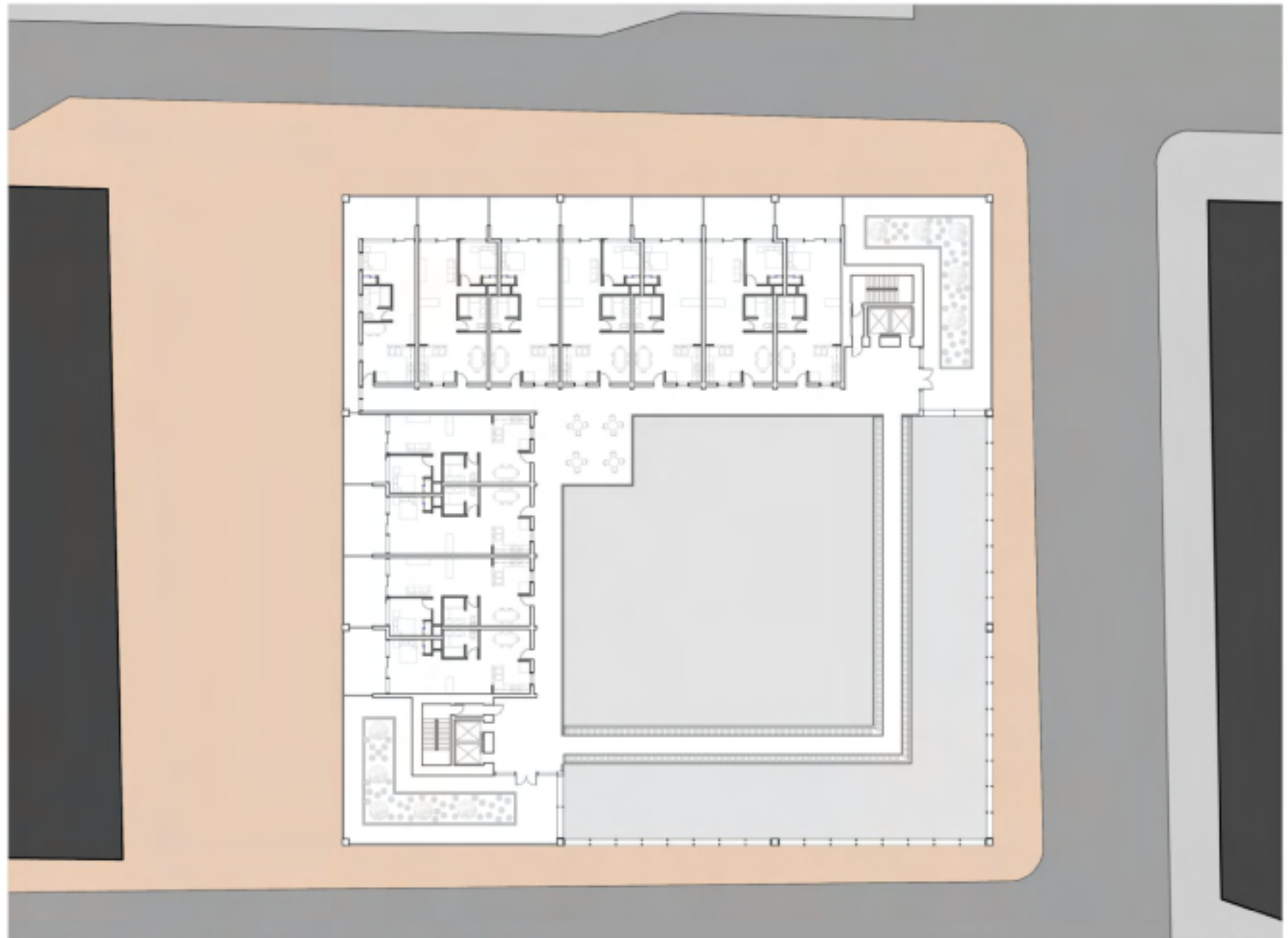


Image 83 : Sixth Floor Plan [Created using AutoCAD and Photoshop]





Image 84: 3D view entering the resident's growing zone from the walkway to the units. People can grow their personal fruits and vegetables here. [Revit and Photoshop]





Image 85: 3D view entering the resident's growing zone from the walkway to the units. People can grow their personal fruits and vegetables here. [Revit and Photoshop]

The seventh floor continues the **residential units** which are arranged in an "L" shape. These units are duplexes and range from two-three bedroom units. Each unit has an **exterior terrace** which connects to the main living space. On the corners of the building (exteriors) are **outdoor growing areas** that receive southeast and southwest sunlight. An "L" shape walkway is used **for residents to grow crops** and area is designated for **seating and gathering space**, overlooking the agriculture zone.

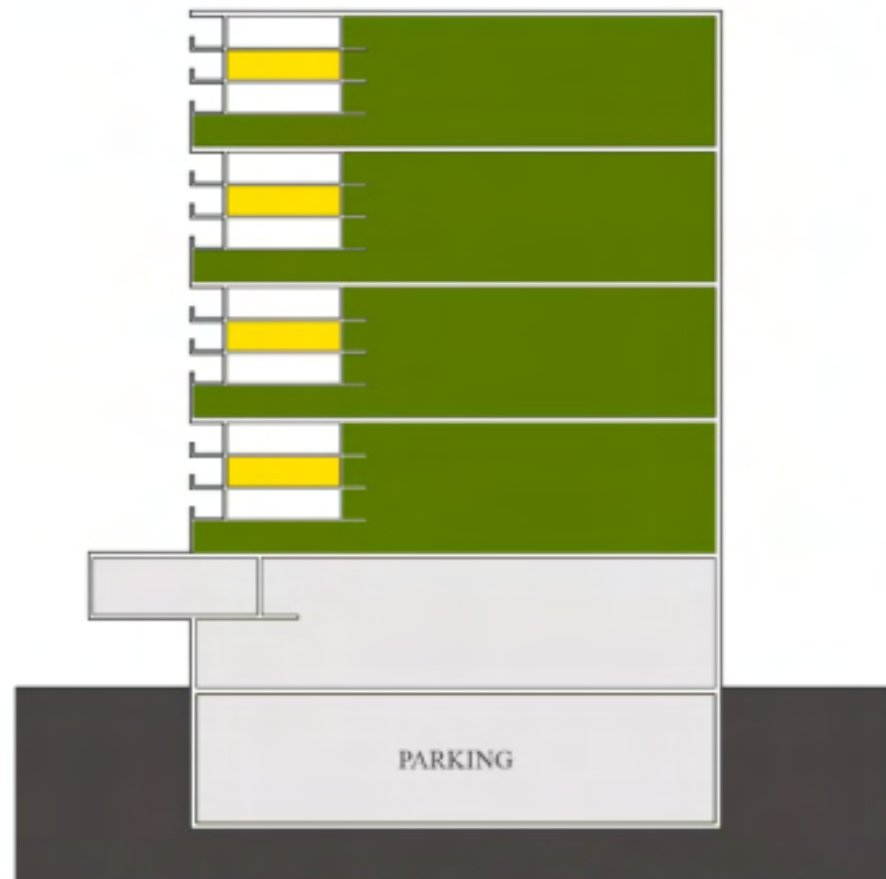


Image 86: To the left is a building section locating floor plate levels and to the right is the site situated within its context. [AutoCAD, Revit and Photoshop]

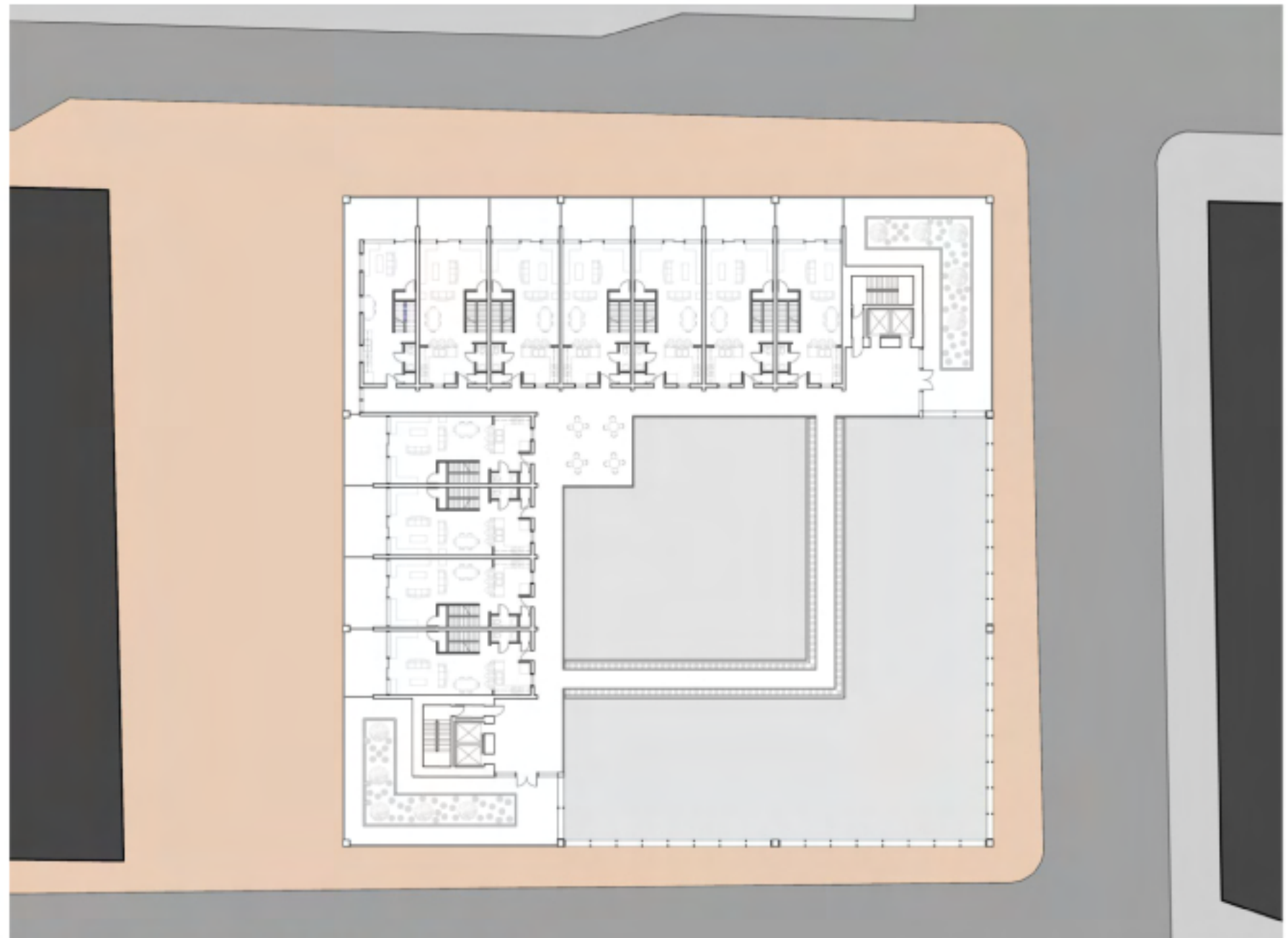


Image 87: Seventh Floor Plan [Created using AutoCAD and Photoshop]





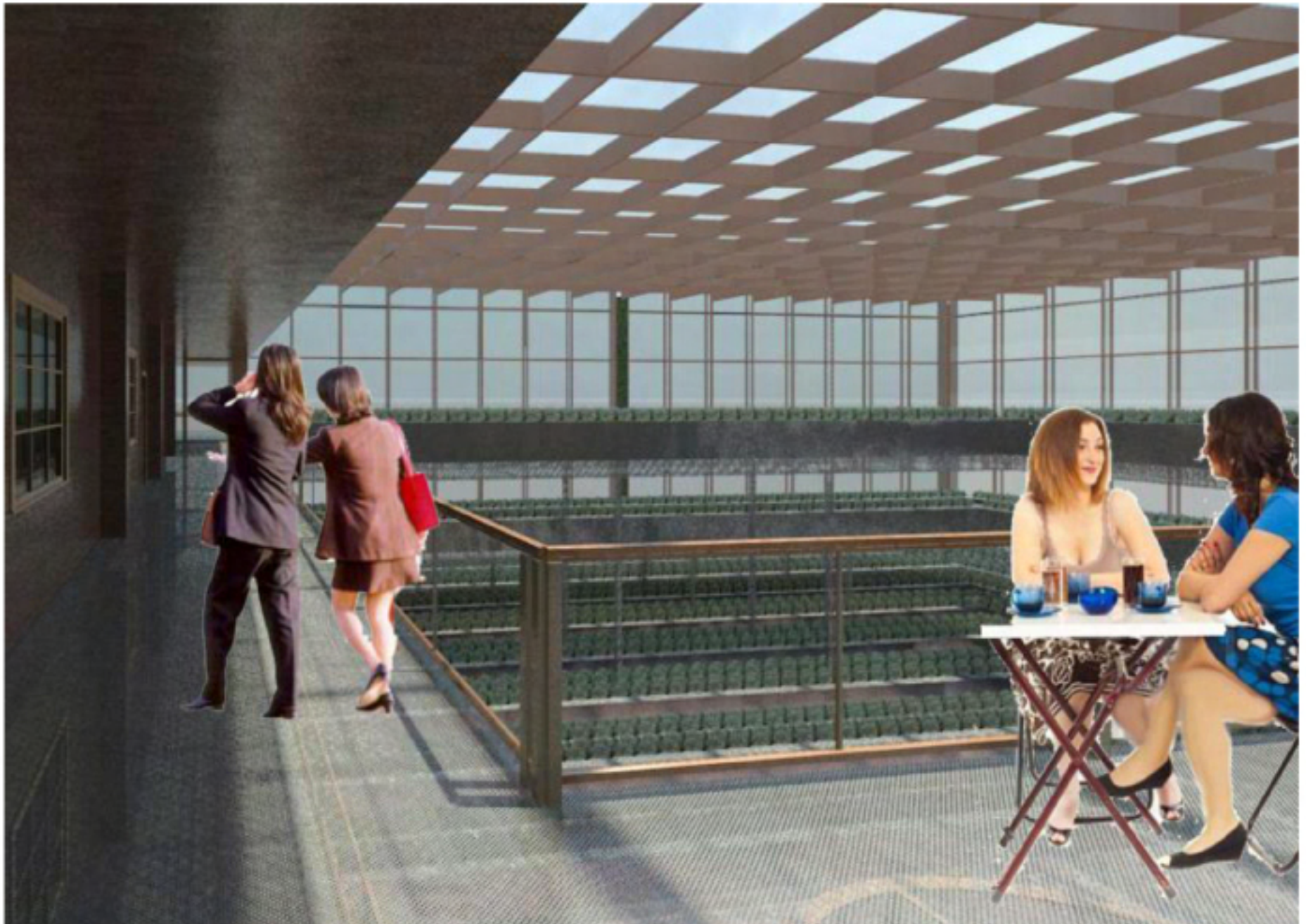


Image 88: 3D view from walkway along the entry to the two level apartments. Corner pushes out to allow for gathering space overlooking the agriculture zone. [Revit and Photoshop]





Image 89: 3D view from the Southern corner of the design showing the agriculture zone on the bottom and the residential farming/units in the background. [Revit and Photoshop]

The eighth floor ends the **residential units** which are arranged in an "L" shape. These units are duplexes and range from two-three bedroom units. Each unit has an **exterior terrace** which connects to the master bedrooms. The corners of the building (exteriors) are **outdoor growing areas** that receive southeast and southwest sunlight. Floor plans five through eight create the first of four clusters that repeat floors 9-12, 13-16, 17-20 until the 250' height limit is reached.

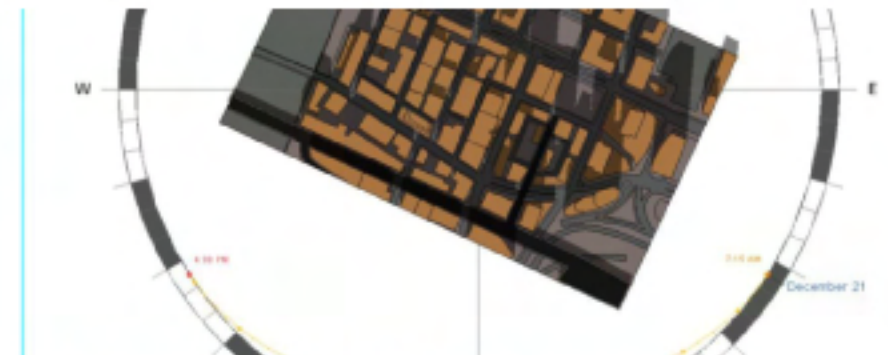
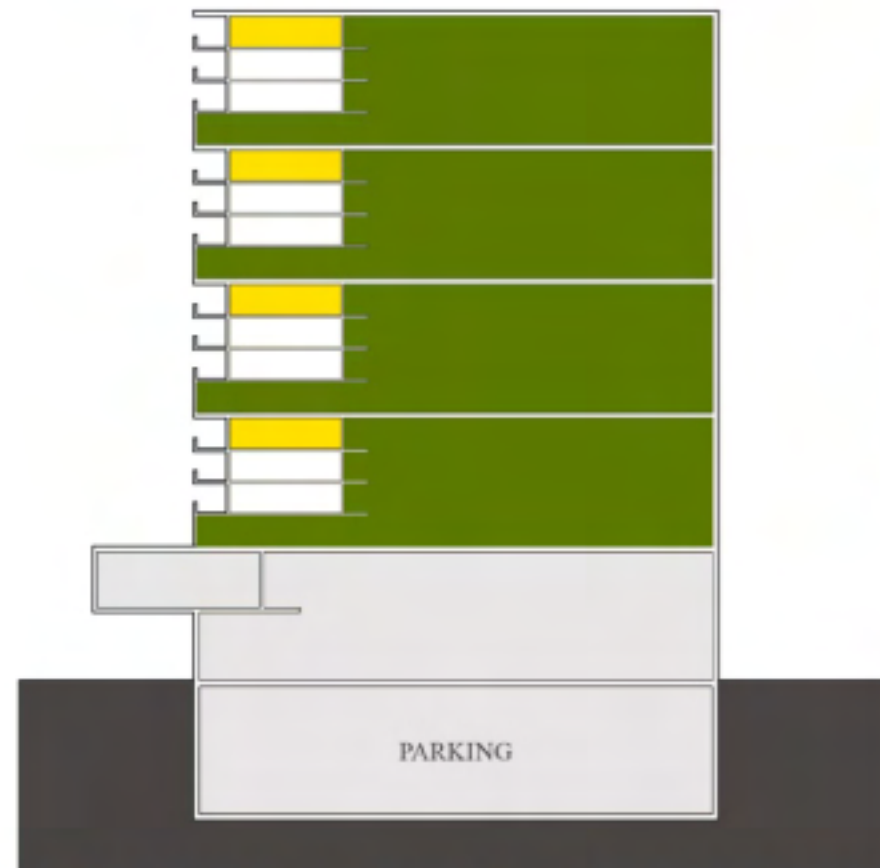


Image 90: To the left is a building section locating floor plate levels and to the right is the site sun diagram for December 21 at noon. [AutoCAD, Revit and Photoshop]



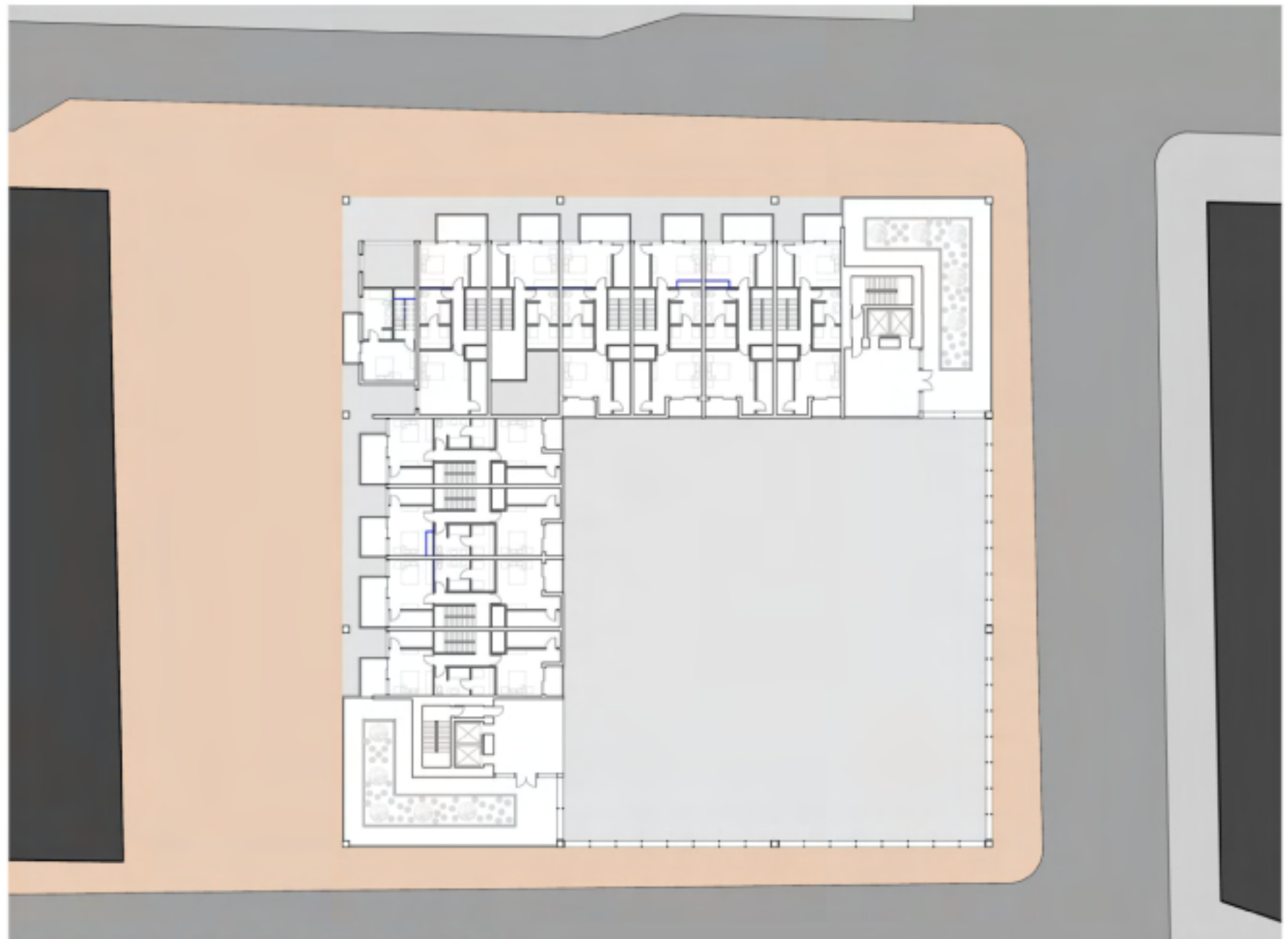


Image 91: Eighth Floor Plan [Created using AutoCAD and Photoshop]





Image 92: 3D view from the Southern corner of the design showing the agriculture zone on the bottom and the residential farming/units in the background. [Revit and Photoshop]





Image 93: 3D view from the bedroom window of the eight floor bedroom looking down upon the agricultural zone of the design. [Revit and Photoshop]



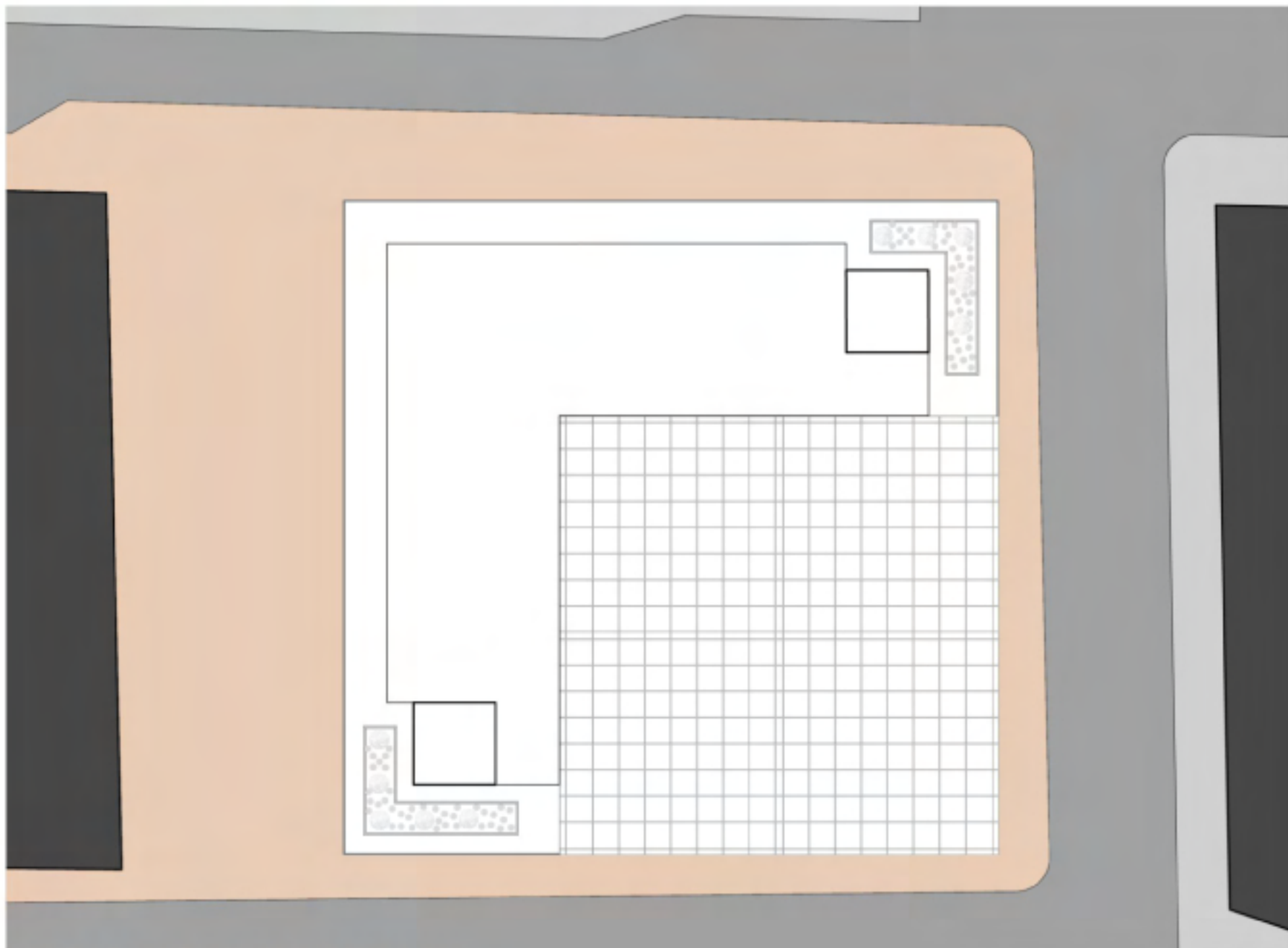


Image 94: Roof Plan [Created using AutoCAD and Photoshop]



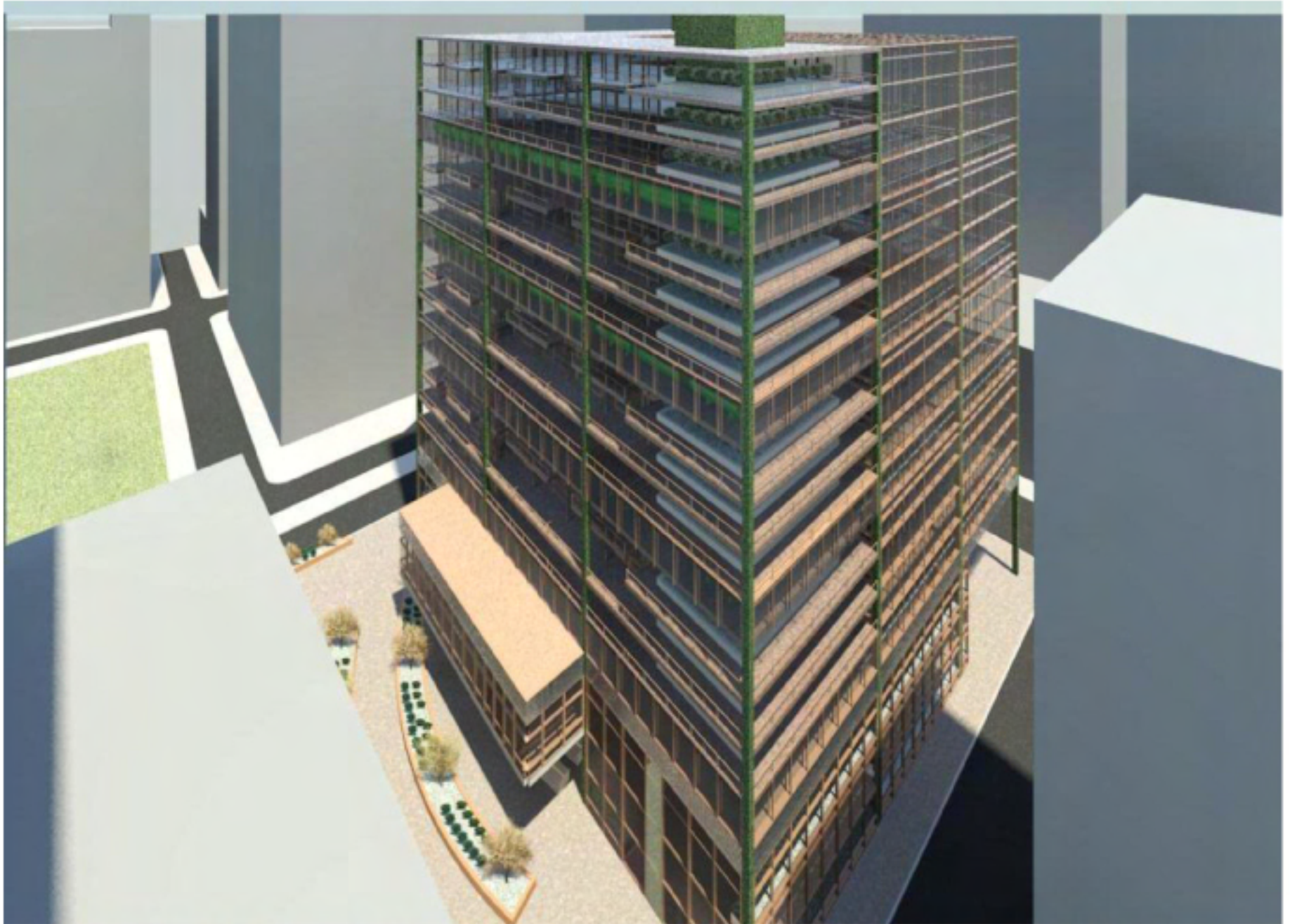


Image 95: Aerial view from the West. The corner has out door growing plots, to the left are balconies for units and to the right is greenhouse. [Revit and Photoshop]



Image 96: Northeast Elevation [Revit and AutoCAD]







Image 97: Northwest Elevation [Revit and AutoCAD]





Image 98: Southeast Elevation [Revit and AutoCAD]







Image 99: Southwest Elevation [Revit and AutoCAD]



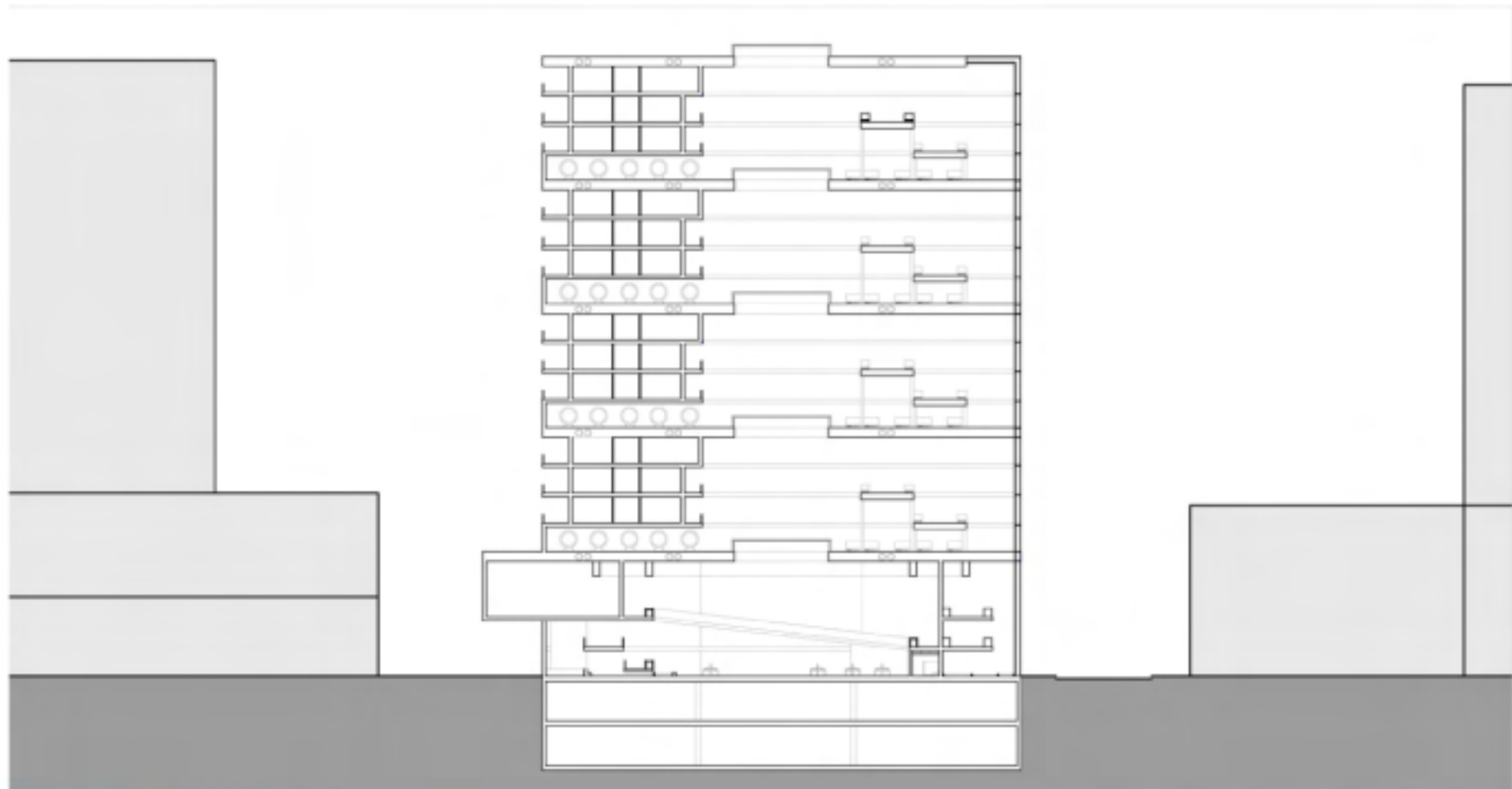


Image 100: Building Section [AutoCAD]



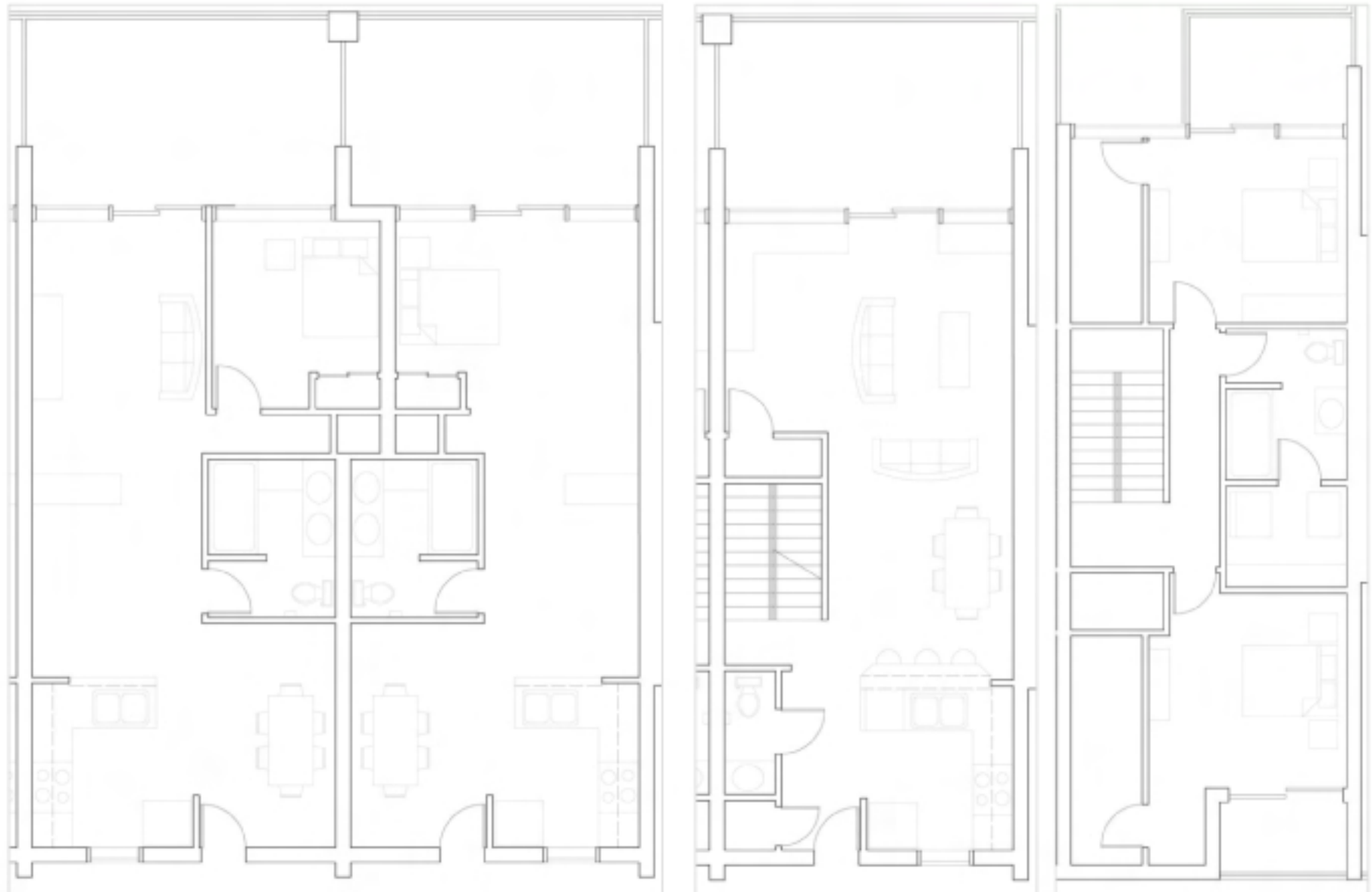


Image 101: Larger scale housing units. From left to right: one bedroom unit, studio unit, first floor duplex, second floor duplex (two bedrooms) [AutoCAD]





Image 102: Interior of first floor duplex unit. [Revit]



Image 103: Interior of first floor duplex unit. [Revit]





Image 104: Interior of first floor duplex unit. [Revit]





Image 105: Interior of first floor duplex unit. [Revit]



Image 106: Interior of first floor duplex unit. [Revit]





Image 107: Interior of first floor duplex unit. [Revit]





Image 108: 3D view from the bottom level of the agricultural zone with the resident's farming and units behind. [Revit and Photoshop]

**Community** is the result of combining vertical farming and residential units. Meeting neighbors at the personal gardens and *outside community members* in the market or cafés encourages social *interaction*. The unique combination of program creates a truly alternative living in the city. Not only does the building promote social interactions and increase the idea of community; the design results in a structure that gives to those within and out. Members of the local community are invited into the design to both shop for themselves and families, but to interact with each other and residents. Traditional farming may be a preference to many people, but to take the uncontrollable factors of weather, insects, pesticides, and natural disasters that many farming areas face, vertical farming stands to be a viable alternative/supplement....

COMMUNITY created through vertical farming...





## Appendix A- Communitarian Settlements

The research project started with a study of early communitarian development in the history of the United States. The way that people used the land and lived together inspired the design proposal. One of the major problems with rural development is sprawl, an inappropriate use of density. There is also a lack of interaction with surrounding communities in the sense that isolation occurs quite easily. The early study influenced my design tremendously and essentially led to a design of cohousing or communal living in the city that uses a modern approach of vertical farming instead of traditional methods. The following sums up the early research that was done.

### COMMUNITARIAN IDEALS

In order to understand the Communitarian movement they need to be viewed in contemporary terms as well as being defined by their essential characteristics. The experimental communities offered solutions that ranged from the complete community of goods practiced by the Shakers to the elaborate joint-stock organization of the Fourierist phalanxes, avowedly designed to safeguard every type of vested property interest. The various socialistic colonies of the early nineteenth century cannot possibly be subsumed under any definition paraphrased in purely economic terms.

What these enterprises had in common was the idea of employing the small experimental community as a lever to exert upon society the force necessary to produce reform and change. The ends might differ, with economic, religious, ethical, and educational purposes mingled in varying proportions. But the means were uniform, consistent, and well defined. These enterprises constituted a communitarian movement because each made the community the heart of its plan.<sup>1</sup>

Communitarianism is collectivistic not individualistic, it is resolutely opposed to revolution, and it is impatient with gradualism. Such a position may seem no more than an elaborate and self-defeating paradox. To the communitarian it was not. The small, voluntary, experimental community was capable, he believed, of reconciling his apparently divergent aims: an immediate, root-and-branch reform, and a peaceable, non-revolutionary accomplishment thereof. A microcosm of society, he felt could undergo drastic change in complete harmony and order, and the great world outside could be relied on to imitate a successful experiment without coercion or conflict.

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<sup>1</sup> Bestor, Arthur. Backwoods Utopias: The Sectarian Origins and the Owenite Phase of Communitarian Socialism in America, 1663-1829. University of Pennsylvania Press. Pennsylvania, 1970. Pg. 3

There is a great deal of religion evident in the development of Communitarian ideology. The Hebrews phrased it, a City of God in the language of St. Augustine. When such a separation from the world is thought to afford not only a means to individual salvation but also an example of the life through which all men may be redeemed, then this religious concept approaches the communitarian ideal. It did so, for example, in St. Benedict's view of the monastery as "a little State, which could serve as a model for the new Christian society."<sup>2</sup>

As critics, the communitarians are full of the most valuable materials for the enlightenment of the working class, according to Marx and Engels, because they attack every principle of existing society. But the Utopian element in their thought, according to the Manifesto, vitiates all their teaching.<sup>3</sup>

Though a philosophy of history is by no means absent, communitarian writings are, in truth, concerned more with inventing solutions to social problems than with investigating deterministic historical trends.<sup>4</sup>

A passage from the antislavery Liberator in 1840 states: Can society ever be constituted upon principles of universal Christian brotherhood? The believing Christian, the enlightened philosopher answer – It can. Will this organization commence with the entire race of man? With existing governments? Or with small isolated communities. Doubtless, the principles of this new organization must be matured in the hearts and lives of individuals, before they can be embodied in any community, but when the new organization commences, it will doubtless be in small communities.<sup>5</sup>

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<sup>2</sup> Bestor, Arthur. Pg. 4-5

<sup>3</sup> Bestor, Arthur. Pg. 11

<sup>4</sup> Bestor, Arthur. Pg. 15

<sup>5</sup> Bestor, Arthur. Pg. 19

## EARLY COMMUNITARIAN SETTLEMENTS IN AMERICA

The Church of the United Brethren (Unitas Fratrum), also known as the Moravians have communities dating back to 1722. In 1741 the Moravians established their most important settlements, at Bethlehem and Nazareth in Northampton County, Pennsylvania. Communitarian tendencies, already manifested at Herrnhut, were intensified by the arrangements the Moravians made during the passage from Europe to America. In the New World, faced by the difficulties of maintain themselves and by the dangers of Indian attack, their communism crystallized at Bethlehem into the so called "General Economy." Each member contributed his time and labor to the General Economy, which gave no wages in return, but provided food, clothing, and shelter for members and their children. Because the church purchased the land and the individual embers brought almost nothing with them, there was no actual surrender of private possessions already existing. On the other hand, all the fruits of the members' labor, including the buildings and industries created by them, belonged to the General Economy, being the church. The mingling of social and religious factors so characteristic of all American sectarian communities is brought out clearly in the Moravian experiment.<sup>6</sup>

The Moravians, who brought their ideas with them to America, were one type of settlers in the early Communitarian communities. Pressure of American conditions on the other hand caused the development of the Shakers. When arriving to America this group of settlers was able to find work, but due to persecution and hardship they changed to a different lifestyle. Persecution and hardship of making a living led them forward into a fully communitarian way of life. Described in the words of one of the members, the gathering of the society began at New-Lebanon, in the month of September, 1787, and continued to progress as fast as circumstances and the nature of the work would admit. Elders and deacons were appointed to lead and direct in matters of spiritual and temporal concern; suitable buildings were erected for the accommodation of the members; and order and regularity were, by degrees, established in the society; so that by the year 1792, the Church was considered as established in the principles of her present order and spirit of government. Those who were thus gathered into a united body, were denominated, the Church; being a collective body of Christians separated from the world, and enjoying, in their united capacity, one common interest.<sup>7</sup>

The Shakers demonstrate a sure system, founded upon the principles of a unity of interest in all things, which has stood the test a sufficient length of time, to prove that it can be attained and supported. The United Society of Believers (Shakers) was founded upon the principles of equal rights and privileges, with a united interest in all things, both spiritual

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<sup>6</sup> Bestor, Arthur. Pg. 24

<sup>7</sup> Bestor, Arthur. Pg. 26



and temporal, and has been maintained and supported in this Society, at New-Lebanon, about sixty years, without the least appearance of any failure. This is sufficient proof that such a system can work.<sup>8</sup>

The leader of the Shakers, John Humphrey Noyes states, "The great facts of modern Socialism are these: From 1776 – the era of our national Revolution – the shakers have been established in this country and prosperous religious Communism has been modestly and yet loudly preaching to the nation and the world. New England and New York and the great West have had actual Phalanxes before their eyes for nearly a century. The example of the Shakers has demonstrated, not merely that successful Communism is subjectively possible, but that this nation is free enough to let it grow. Who can doubt that this demonstration was known and watched in Germany from the beginning; and that it helped the successive experiments and emigrations of the Rappites, the Zoarites and the Ebenezer's? . . . It is very doubtful whether Owenism or Fourierism would have ever existed, or if they had, whether they would have ever moved the practical American nation, if the facts of Shakerism had not existed before them, and gone along with them."<sup>9</sup>

Sectarian communities suggested to many Americans the possibility of social reform by means of communistic or co-operative colonies. An increasing interest in the religious experiments became evident about 1820 and contributed greatly to the success of the Owenite propaganda that began in 1824. Similarly the even more widely diffused interest of the 1840's underlay the Fourierist enthusiasm of that decade.<sup>10</sup>

Owenism can best be described as a philosophy. Robert Owen talked much of the new principles he had discovered, and as he grew older his list grew longer. The last analysis was a system of logic with one sole expression. "That the character of man is, without a single exception, always formed for him."<sup>11</sup> In his communities, Owen refused to differentiate his responsibility as a manager from his responsibility as a citizen. He held that society was entitled to the fullest possible return for its effort, and that the primary duty of those in control of the industrial system was to secure this result. Without ceasing to regard himself as the manager of a business enterprise, Owen in the end made management identical with social and economic Statesmanship. At a cotton manufactory in New Lanmark, Owens intended to change the general character of the village. The cotton manufactory, set in a company town, was not intended to change its function as a business establishment. He feels that it could be run differently by re-creating new

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<sup>8</sup> Bestor, Arthur. Pg. 41

<sup>9</sup> Bestor, Arthur. Pg 53

<sup>10</sup> Bestor, Arthur. Pg. 58

<sup>11</sup> Bestor, Arthur, Pg. 61

conditions. Education was one of the factors that were to establish the idea of the community rather than the individual.<sup>12</sup>

Robert Owen believed that a healthy and happy society could not be based on the great overgrown cities that industrialism was spawning, or, at the other extreme, upon "single and detrimental solitude." He observed the effects of a gradual increasing population, from a few families until they amounted to about twenty-five hundred souls, and assured himself that the minimum and maximum had both been passed. His conclusion was that the best medium number ranges between eight hundred and twelve hundred and that all associations of men, when they become rational, will be composed of congregations never descending below five hundred, nor ascending above two-thousand. He also felt that technology and industrialization had their benefits. He firmly believed that men could master its problems and use its power to create a society richer in every respect than those of the past. The starting point of his plan in 1817 was his calculation that machinery had increased the productive power of Great Britain fifteen or twenty fold in the preceding quarter century. Mechanisms could be changed from the greatest curse to the greatest blessings of all time. Mechanism and science will be introduced to the society to execute over laborious, disagreeable, or injurious work to human nature.<sup>13</sup>

Robert Owen stated, "The first society will be founded on the following principles. Those who will be received the first shall be chosen amongst the best principled being, in order to form by their example those who afterwards will be received indiscriminately. The town already built will be allowed to them for their residence, and they will remain there until the community will allow them to take place in the new town, which plan would be too long to detail. The rest settlers by their wealth, their industry will establish all that is proper to accumulate prosperity, union, peace and consequently, happiness. The children's education is what will occupy the most, because from them depend the future prosperity not only of the community but all. Those who will be witnesses of such happy result will of course be convinced that the present state of society is founded on such principles that is quite impossible to be happy according its rules. This is but an imperfect sketch, but you'll be soon here; and not doubt remain I my mind that you'll join the plan as soon as you' be informed of it as we are."<sup>14</sup>

In terms of layouts of these communities both Owen and Fourier recommended the centralized grouping of the buildings, which were to be interconnected by enclosed passageways. Fourier's "phalanstery" was a great palace with

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<sup>12</sup> Bestor, Arthur. Pg. 67

<sup>13</sup> Bestor, Arthur. Pg. 75

<sup>14</sup> Bestor, Arthur. Pg. 156

wings and Owen planned a closed "parallelogram" with living apartments around the four sides, and school, church, and dining hall across the center. There were strong similarities between the two ideals but Owen located workshops at a distance across the fields, where Fourier had his occupy the wings of the main building, which is a point highly criticized by Owen.<sup>15</sup> The Owenite doctrine states: "Equal Distribution: that which affords to every individual equally exerting, or equally willing to exert, his or her faculties for the common good, equal means of physical, intellectual, and social enjoyments...Community of Property: By community of property work possessions, we do not mean, that no person shall possess anything, but that every adult person shall possess everything, that is to say, all the lands, houses, machinery, implements and other stock of the community, in an ample a manner as they are possessed by any other member whatever."<sup>16</sup> Owen's principles were communitarian, not revolutionary. He insisted that the very foundation of society must be laid afresh, its construction must be altogether different; no part of the new will resemble any part of the old. But he also argued that such a change can never be introduced through a revolution of violence, it must be through harmony of thought, feeling and action. Owenism strongly differs from the religion based societies because it became a social program which Americans could support without worshipping a specific god.

The ultimate goal is to create the pure community where wealth produced by society, should not be individual, selfish, and exclusive property, but social and common benefit and wealth. "If men lived in pure and perfect communities, where all things were as they should be, man's social rights would not destroy, as they now do, the natural rights he possessed in his wild and unassociated state. And, as men claimed a right in their natural and unassociated state to everything around them; so they should claim, in a pure community, a right to all around them."<sup>17</sup> Certain communities should be assembled in any given district – each community living in common, though with separate and private dwellings for each family, and cultivating in common its allotted portions of earth, and prosecuting its own manufactures. These communities inhabit a large square of buildings, within which are the schools, refectories, dormitories, and other public rooms. Robert Owens wrote the following to his father about the conditions: "As for building houses, that is at present out of the question. We have no lime, no rocks (ready blasted), no brick, no timber, no boards, no shingles, nothing requisite for building, and as to getting them from others, they are not to be had in the whole country. We must ourselves produce the whole of them, before we can build, we must dig and burn the lime, dig and blast the rocks, mould and burn the bricks, fell and hew the timber, fell and saw the boards and split the shingles,

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<sup>15</sup> Bestor, Arthur. Pg. 77

<sup>16</sup> Bestor, Arthur, Pg. 84

<sup>17</sup> Bestor, Arthur. Pg. 99



and to do all these things; we have no hands to spare or the branches of business in the Society must stop, and they cannot stop, or the whole Society would stop too."<sup>18</sup>

## EDUCATIONAL COMMUNITARIAN IDEALS

There wasn't only a strong belief in education within communitarian communities but a tendency of educational reformers to think in terms of communitarian. Schools in the early nineteenth century were giving increased attention to the social context of education. So long as this wider outlook inspired to more than an adjustment of the curriculum to changes in society, it had few implications for the reform movement generally. But there were educationists to whom the relationship between school and society appeared a reciprocal one. School should respond to social change, they held, but it should also be an instrument for effecting desirable alterations in society. Within the society there is a desire to unite agricultural science with one or other town industry.<sup>19</sup> Since Knowledge is Power in political societies, and it perhaps, as impossible, to keep a well informed people in slavery as it is to make an ignorant people enjoy the blessing of freedom. In the end economic equality, education, and liberty are linked in a continuous circle of cause and effect, or the equal division of property gives vigor to the great mass, and facilitates the acquiring of knowledge, which must be the foundation of all power.<sup>20</sup>

Within the communities there are two possible ways to educate. One of two things is necessary to secure to the millions the necessary quantum of knowledge: either that more of the people's money be expended in furnishing instruction to their children, or, that instruction be so simplified that the children could feed, clothes and educate themselves by their own labor; thus rendering them independent even of their own money, which they pay daily into the treasury. William Maclure, who joined Owen in his work, feels that, "The success of the federal system in the United States encouraged him to hope that "thousands, or hundreds of thousands of small societies might exist, separate yet federated, and might traffic and deal with each other in the true spirit of quality...exchanging labor for labor, without permitting avarice to introduce its poison in the form of coin – wasting none of their labor in counteracting or injuring one another."<sup>21</sup>

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<sup>18</sup> Bestor, Arthur. Pg. 130

<sup>19</sup> Bestor, Arthur. Pg.137

<sup>20</sup> Bestor, Arthur. Pg. 149

<sup>21</sup> Bestor, Arthur Pg. 152

## OWENS NEW HARMONY COMMUNITARIAN COMMUNITY IN AMERICA AND RESULTING DEVELOPMENT

With the machinery now on hand, our operations in the wool business should turn out one hundred and sixty pounds of yarn per day, but the want of spinners reduces the business much below that amount. The fulling and dressing departments have, at present, neither regular superintendents nor workmen; consequently they are not prosecuted with effect. The cotton spinning establishment is equal to producing between three or four hundred pounds of yarn per week, and is under very good direction; but skillful and steady hands are much wanting, which time will furnish from our present population. The dye-house is a spacious brick building, furnished with copper vessels capable of counting between 1500 and 2000 gallons; and will probably compare in convenience with any other in the United States. At present, this valuable establishment is doing nothing, for want of a skillful person to undertake the directions of it."<sup>22</sup> The exports produced by the various textile factories will in essence cancel out the cost to import needed items from outside the community. Getting the factories up and running was the main concern and the community would eventually produce and educate enough workers to increase production. The population started only at around eight hundred, with only 137 skilled workers. Along with the textile production there was an agricultural development as well, which was slow to take off. The success of this development was not what it was planned but it was an experiment that had all the necessary compounds for a self sustained community, but lacked the skilled workers to run it. Much of the funding was given out of Owen's own pocket so that the realization of this model could be achieved. Members of the community were provided with houses and given an "allowance" every week for food and other necessities. Even though the community needed funding to keep from failing it is the principles in action that are important. One resident is quoted in the following, "I have become a Harmonite and mean to spend the remainder of my days in this abode of peace and quietness. I have experienced no disappointment. I did not expect to find everything regular, systematic, convenient – nor have I food them so. I did expect to find myself relieved from a most disagreeable sate of life, and be able to mix with my fellow citizens without fear or imposition – without being subject to ill humor and unjust censures and suspicions – and this expectation has been realized – I am at length free, my body is at my own command, and I enjoy mental liberty, after having been deprived of it."<sup>23</sup> The community was strengthened with weekly dances on Tuesday nights, concert on Thursday or Friday, public discussion on Wednesday, and lectures on science, religion, and different philosophies. "No one is to be favored above the rest, as all are to be in a state of perfect equality."<sup>24</sup>

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<sup>22</sup> Bestor, Arthur Pg. 162

<sup>23</sup> Bestor, Arthru Pg. 167

<sup>24</sup> Bestor, Arthur. Pg. 175

New Harmony was altered along its experimental path. Owen adopted a proposal for the third reorganization of occupations. Three independent communities emerged – a School or Education Society, an Agricultural and Pastoral Society, and a Mechanic and Manufacturing Society, which were bound together by a Board of Union. The New Harmony experiment ended in 1827, but as a community set apart from others, that was dedicated to high intellectual and social ends, and more or less consciously offering itself as a model for the future, was still alive. Even though it wasn't a communitarian colony to the strict sense at its end, elements of the communitarian ideal had become part of its life.<sup>25</sup>

The impact New Harmony and other communitarian settlements had on the outlook of the United States and its leaders was tremendous. Thomas Jefferson responded to a plan that was sent to him by saying, "I think myself that we have more machinery of government than is necessary, too many parasites living on the labor of the industrious. I believe it might be much simplified to the relief of those who maintain it. Your experiment seems to have this in view. A society of 70 families, the number you name, may very possibly be governed as a single family, subsisting on their common industry, and holding all things in common. Some regulators of the family you still must have, and it remains to be seen at what point of your increasing population your simple regulations will cease to be sufficient to preserve order, peace and justice. The experiment is interesting; I shall not live to see its issue but I wish it success equal to your hopes and to yourself and society prosperity and happiness."<sup>26</sup>

Owen's model society New Harmony also inspired others and led to unexpected social changes. Miss Frances Wright was inspired by Owen's communitarian principles and experiment and set out on her own that included both freed and bought slaves. When she combined her experimental educational program of Negro students with a white community she had no intentions of creating equality among the students. But her intentions were to educate the students together so that when they were adults and entered as community leaders discrimination could be erased. The experimental communities allowed for social injustices to be abolished and create a pure community of equality.

"It was not the Owenites who kept communitarianism alive during the years from 1827 to 1840, it was the sectarian communities. The Shakers, the Rappites, and the Separatists of Zoar were untouched by what Owen did. Though the number of these communalities did not increase in the decade after the New Harmony failure, their membership grew steadily, and their material prosperity mounted even faster."<sup>27</sup> These co-operative colonies can be defined by as communitarianism or utopianism. It is important to distinguish between the two; Communitarianism and Utopianism. Communitarian has been defined earlier by a small scale social experiment, where construction of an society would serve as a model for future societies to be duplicated. "The communitarian was not necessarily a utopian; few of

<sup>25</sup> Bestor, Arthur. Pg. 201

<sup>26</sup> Bestor, Arthur. Pg. 209

<sup>27</sup> Bestor, Arthur. Pg. 229



the religious communities, for example, attempted to visualize an ideal future society this side of heaven. When the communitarian did indulge in utopian visions, the characteristic fact about them was that they always pictured the future as something to be realized through a small scale experiment indefinitely reduplicated. The communitarian conceived of his experimental community not as a mere blueprint of the future but an actual, complete, functioning unit of the new social order."<sup>28</sup> The United States was an important area for development of these societies because the environment provided, "virtually complete religious liberty and comparatively inexpensive (though hardly free) land."<sup>29</sup>

## UTOPIAS AND MORE RECENT DEVELOPMENT

### THE ZIONIST IDEAL: "KIBBUTZ SHALOM"

East of Nazareth there is a place known as Kibbutz Shalom. The development is comprised of a cluster of white single-story houses surrounded by trees, rosebushes, purple jacaranda, pink and white Bohemia shrubs, brilliant marigolds, and acres of grass, orchards, and farm fields. There is also a watchtower that rises above the settlement. There was a large shed structure that served as a cannery and toy factory, housing units that contained three apartments (one or two rooms), radiating from the center of the kibbutz. "The Bet Tarbut, the central public building, served as the communal dining hall and as a meeting place for assemblies, celebrations and cultural events. School buildings, playgrounds, a sports field for adults, and even a swimming pool adjoined the Bet Tarbut. People were busily engaged in work in the fields, the communal store, the laundry, a huge kitchen, the library, the schools, a mechanized dairy, the bakery, a small workshop for tailors, seamstresses, and shoemakers, and in the children's houses and the factories. All seemed peaceful, except for the grim presence of armed guards at the kibbutz perimeter. Founded by a handful of young Germans, the kibbutz was no considered medium in size, with about three hundred adult members and two hundred children and visitors. Members wished to maintain a small, intimate 'family.'"<sup>30</sup>

The workers were not paid for labor, but received an allowance. Everyone was treated equally and possessed the same amenities. The community has fields laid out that produce eight thousand tons of grain a year, vegetable gardens that made the community self sufficient, a vineyard, a grapefruit orchard that yielded ten thousand boxes of fruit annually, a poultry farm, abundant cotton fields, and a lush olive grove. To expand economic growth the kibbutniks had

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<sup>28</sup> Bestor, Arthur. Pg.231

<sup>29</sup> Bestor, Arthur Pg. 261

<sup>30</sup> McCord, William. Voyages to Utopia: From Monastery To Commune – The Search For The Perfect Society In Modern Times. W.W. Norton & Company. New York and London, 1989. Pg. 42

to industrialize, which in essence destroyed the community in which they had built. Outside workers and many factories clustered their previously Utopian Community, with a goal of community.

## CALIFORNIA AND AMERICAN UTOPIAS

"The counterculture of the 1960's spawned a particularly wide and diverse cultural revolution. Most of the communes were rural, but some were urban. Some expressed a secular interest in psychology, while others emphasized religion. More Americans than ever before joined thousands of communal ventures, united only in their rejections of the American status quo."<sup>31</sup> There was a strong rejection to technology and modern civilization and a strong objection to capitalism. The goal was to create a society where the individual can fulfill his/her highest potential. In a long-lasting commune, "The Ranch," some of these new American Ideals were put into action. Youthful radicals wanted change from old social ideals and topics were included in the work of Buckminster Fuller when he stated: "We must do away with the absolutely specious notion that everybody has to earn a living...that everybody has to be employed at some kind of drudgery because, according to Malthusian-Darwinism theory, he must justify his right to exist...The true business of people should be to...think about whatever it was they were thinking about before somebody came along and told them they had to earn a living."<sup>32</sup>

Described by an American Capitalist, "America not only more so, . . . the national culture at its most energetic end...In a prosperous country we are more prosperous than most; in an urban country more urban than most; in a gadget-happy country more addicted to gadgets; in a mobile country more mobile; in a tasteless country more tasteless; in a creative country ore energetically creative; in an optimistic society more optimistic; in an anxious society ore anxious."<sup>33</sup>

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<sup>31</sup> McCord, William. Pg. 55

<sup>32</sup> McCord, William. Pg. 59

<sup>33</sup> McCord, William. Pg. 283





## Appendix B – Seaport Square Design

\*\*\*The following information is obtained from analyzing the Boston Redevelopment Authority's master plan pdf document of 700 pages. It provides more in depth information and views of what the project is about. The information is a shortened version of the original document.\*\*\*

### Project Site

After decades of **neglect** and **underdevelopment**, South Boston's Seaport District is now recognized as the next great neighborhood in the City of Boston. Numerous development projects are planned, underway or recently completed, with **Seaport Square** positioned at the geographic center of this **rapidly changing** area. The Project Site consists of approximately 23 acres of land currently occupied primarily by surface parking lots. The Project Site is generally bound by Northern Avenue and Seaport Boulevard (between Old Sleeper Street and East Service Road) and by Stillings Street, Boston Wharf Road, East Service Road, and B Street (between Seaport Boulevard and Summer Street). The **only existing building** on the site is the **Chapel of Our Lady of Good Voyage**.

To the north, south, east, and west of the Project Site, planning, permitting, and construction has moved forward in the past ten years to redevelop previously underutilized areas of South Boston, which has resulted in the significant transformation of many acres of other surface parking lots and major improvements to roadway infrastructure, particularly in the Seaport District. Recently completed projects by others including **Seaport World Trade Center**, the **Boston Convention and Exhibition Center (BCEC)**, the **Moakley Federal Courthouse**, and the **Institute of Contemporary Art (ICA)** have added new uses and new attractions to the area, signaling renewed vitality for the Seaport District. The Fan Pier mixed-use development, filling the gap between the Federal Courthouse and the ICA, has also begun construction, and a number of additional development projects are in the planning stages.



## Project Description











Seaport Square will transform 23 acres of land currently used as surface parking lots into a vibrant, 24/7 neighborhood, just steps from the waterfront and Boston's Financial District (see Figures 1-3 and 1-4). Utilizing thoughtful principles of urban planning, this master planned Project will weave together a unique fabric of residences, offices, shops, restaurants, cultural institutions, educational facilities, hotels, and open spaces spanning 20 city blocks.





Retail will be a major component of the Project, planned for the ground floor, and on the second and third floors in some cases, of most of the proposed buildings. The shops will be a blend of local and regional stores and boutiques mixed with larger national retailers. Large retail tenants such as a grocery store are also being considered.

Seaport Square will offer significant public realm benefits, including creating and activating a generous amount of publicly accessible open space, (green space, new pedestrian ways, and sidewalks), totaling approximately 25% (or approximately six acres) of the Project Site. Highlights include two significant new public open spaces, Seaport Square Green and Seaport Hill, and a new network of local streets and sidewalks including a direct connection to the neighborhood and the waterfront area from Summer Street (see Figure 1-5). These connections will be further enhanced by the substantial amount of ground floor retail space which will help activate the sidewalks and provide a 24/7 experience.

Seaport Square will not only fill an existing urban void, but will link together separate clusters of diverse activity and urban fabric. The Project establishes a series of connections between the Financial District, the waterfront area, the existing, historic Fort Point Channel District and the Fan Pier project. These connections stitch together isolated entities such as the Institute of Contemporary Art, the Seaport World Trade Center, the Boston Convention and Exhibition Center, and the planned future development of Waterside Place.

Five new public spaces establish connections and serve as the framework for the proposed build out and massing of the neighborhood. They are: Seaport Boulevard, Seaport Square Green, Seaport Hill, Harbor Way, and Courthouse Square (see Figure 1-6).





## Seaport Boulevard

The Project will introduce new restaurants, banks, local services, and cafes for area employees and neighborhood residents to enjoy along Seaport Boulevard. Seaport Boulevard is considered a retail promenade, enhancing the pedestrian experience. It will have a planted median, along with traffic lanes in both directions. The buildings that line Seaport Boulevard are designed to mediate two distinct urban fabrics: on the northern side of the Boulevard, a series of higher buildings match the height of the Fan Pier buildings and provide a clear urban edge to the waterfront area, while buildings along the southern side of the Boulevard extend the scale, massing and height of the adjacent industrial brick warehouse fabric, creating a distinct edge to the Fort Point Channel Landmark District.



## Seaport Square Green







**Section Looking East (North Side)**



**Section Looking East**



**Section Looking East (South Side)**





Seaport Square Green is a multi-functional urban open space, similar in size to Boston's Copley Square. It stands at the intersection of the area's major urban axes and acts as a focal point for Seaport Square and adjacent developments. Defined by Seaport Boulevard on one side and Northern Avenue on the other, it connects to the Fan Pier Park, creating a continuous public space that reaches the waterfront and connects to the Harborwalk. This open space is designed to host a range of year-round activities, such as spring art shows, summer theater, fall farmer's markets, and winter displays of ice sculptures and holiday lights. Envisioned as a grand civic lawn large enough to support active recreation and concerts, the Green gently slopes toward the waterfront. Steps cascade down the eastern and western sides of the Green, and a paved pedestrian pathway crosses the Green under a bower of shade trees, connecting to Fan Pier Park via a crosswalk at Boston Wharf Road. A reflecting pool and water feature is proposed at the edge of the lawn along Northern Avenue. A retail pavilion and a new Silver Line MBTA entrance activate the southern side of the Square, resulting in a constant flow of pedestrian traffic and adding a buffer between the green space and Seaport Boulevard. Office, hotel, entertainment, retail, residential, and cultural uses in adjacent buildings, surround Seaport Square Green, activating its edges to provide life to the open space.



## Seaport Hill and Harbor Way







Seaport Hill forms the center of a diverse new residential neighborhood. As in many of Boston's most beloved neighborhoods, housing will be the predominant use. Atop Seaport Hill a new open space of approximately 0.75 acres is surrounded by residential buildings, some with active ground floor retail shop. The open space features green lawns bordered by trees, park benches, flower beds, public art, a dog recreation space and a children's playground. At the edges of the open space, landscaped areas provide a buffer for the adjacent ground floor residential units. Seaport Hill is one of a linked series of spaces connecting the elevated Summer Street downtown to Seaport Boulevard and the waterfront area via the new Harbor Street or Harbor Way. Harbor Street links Summer Street to the neighborhood with pedestrian connections to both Boston Wharf Road and East Service Road. Harbor Way, located at the base of Seaport Hill, is an approximately 15,500 sf open space, providing a pedestrian connection from Seaport Boulevard, and a visual connection to Seaport Square Green.



## Courthouse Square







Courthouse Square is an outdoor public space along Northern Avenue and across from the Moakley Federal Courthouse. It also includes a public pedestrian passage connecting Seaport Boulevard and Northern Avenue between Blocks B and C, culminating with the Square at its northern end. Given its location adjacent to the Courthouse entrance, this space could also be used for public gatherings, and will serve both visitors and users of the Courthouse, the adjacent office buildings and the local neighborhood residents. The Square will be lined with a mix of retail spaces, including restaurants and cafes. Its continuation through the block, connecting Northern Avenue and Seaport Boulevard, will allow greater visual and physical connectivity between the Fort Point Channel District and the waterfront.



Designed to further stimulate the cultural life of the City, the performing arts center will build on the arts identity of the neighboring Fort Point Channel District and leverage its proximity to the ICA and the waterfront, the BCEC, and the numerous adjacent hotels. This Cultural Corridor is a key organizing principle for Seaport Square, and by creating and promoting its identity as a cultural destination, the economic vitality of the new neighborhood's mix of residential, office, and retail uses is further enhanced. Seaport Square's physical connection to the South Boston waterfront and to the City at large is reinforced by developing this Cultural Corridor to contribute to the evolution of civic, cultural, and economic life in Boston.



## Development Program

Table 1-1 Seaport Square Program

Block	Total (gsf)	Retail / Entertainment (gsf)	Residential (gsf)	Office / Research (gsf)	Hotel (gsf)	Educational/ Cultural (gsf)
Block A	86,800	23,600	61,200	0	0	2,000
Block B	562,200	119,900	0	442,300	0	0
Block C	591,000	210,000	381,000	0	0	0
Block D	464,000	69,000	390,000			5,000
Park Pavilion	9,000*	9,000	0	0	0	0
Block G	498,000	128,000	165,000	0	200,000	5,000
Block H	24,300	0	0	0	0	24,300
Block J	86,000	22,000	64,000	0	0	0
Block K	281,300	91,000	90,300	0	100,000	0
Block L1	493,700	78,000	0	415,700	0	0
Block L2	415,200	77,000	0	338,200	0	0
Block L3	202,000	32,000	170,000	0	0	0
Block L4	292,000	32,000	260,000	0	0	0
Block L5	360,000	25,000	335,000	0	0	0
Block L6	249,000	18,000	231,000	0	0	0
Block M1	526,700	226,700	300,000	0	0	0
Block M2	440,500	88,000	352,500	0	0	0
Block N	363,700	0	0	0	0	363,700
Block P	400,000	0	0	0	200,000	200,000
Block Q	154,600	50,800	0	103,800	0	0
<b>Total</b>	<b>6,500,000</b>	<b>1,300,000</b>	<b>2,800,000</b>	<b>1,300,000</b>	<b>500,000</b>	<b>600,000</b>



## Appendix C- Gate Review

This section shows the process work that was developed mid semester to show some of the ideas at their early process. Each image represents a 36x48 inch sheet that was pinned up and critiqued by various critics. Following the sheet layouts are early ideas for spatial conceptions and renderings.



VIEW A: SEAPORT BOULEVARD



VIEW B: SEAPORT BOULEVARD



VIEW C: ELEVATED SUMMER STREET (CURRENT PARKING LOT CONDITION, TO RIGHT B.R.A. SKETCH)



VIEW D: SEAPORT SQUARE PARK (DIAGONAL FROM PUBLIC ENTRY OF LOBBY- B.R.A. SKETCH)



AERIAL VIEW - SEAPORT DISTRICT BOSTON, MA



VIEW E: SEAPORT SQUARE BOULEVARD (B.R.A. SKETCH)



VIEW F: SEAPORT HILL DEVELOPMENT (B.R.A. SKETCH)



VIEW G: VIEW ON CULTURAL CORRIDOR (B.R.A. SKETCH)



## THESIS IDEAS, PRECEDENTS, PROGRAM, & SITE

THESIS DESIGN BY ZACHARY SILVIA - ROGER WILLIAMS UNIVERSITY  
SEAPORT BOULEVARD BOSTON, MA (WITH B.R.A. REDEVELOPMENT PLAN)  
MIX-USE DEVELOPMENT FOCUSING ON COMMUNAL LIVING THROUGH VERTICAL FARMING





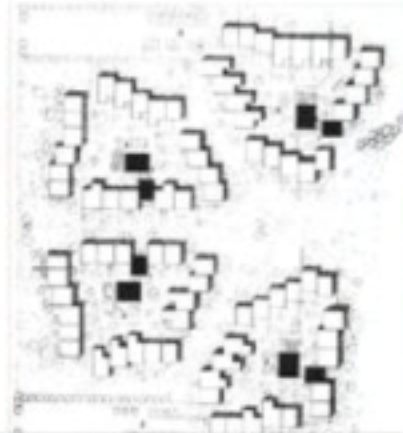
# AN ALTERNATIVE CITY LIVING

## THE DESIGN OF A MIX-USE BUILDING FOCUSED ON COMMUNAL LIVING THROUGH VERTICAL FARMING

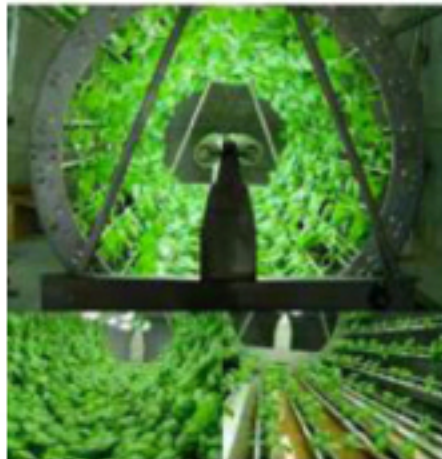
The exploration of the thesis proposal evolved from a rural, self-sustaining, agricultural community [that reached in isolation], to a vertical farming and housing high rise development that promotes community [through agriculture]. Primarily the focus of the project is to create a community that is linked by a shared function of agriculture, at the same time providing the surrounding neighborhood local produce and the opportunity to learn about vertical farming. Incorporating the surrounding community is achieved through the indoor/outdoor market on ground level and a four story lobby that allows the public to see different systems (aquaponic/greenhouse) first hand through the procession to a community meeting space. Above the public base or lobby of the building is where four communities of 25 units each are created through an "L" shape of apartment units, adjacent to a large greenhouse and aquaponic systems that produce the crops for the market and residents. The project is located on Seaport Boulevard in Boston, MA and is using the Boston Redevelopment Authority's development plan for the Seaport District as a master plan. Located along the "Cultural Corridor," a planned pedestrian walk (by the B.R.A.) that connects the ICA to the Boston Convention Center, with an elevated ramp. Also located along the path are planned cultural developments and an art museum.



SARGJ AMIR COMMUNAL HOUSING BY BKD ARCHITECTS



FOUR CLUSTERS HOUSING, DENMARK



OMEGA GARDEN - HYDROPONIC SYSTEM

In 20 sq. ft of floor space 300 plants can be grown.

-Maximizes light capture with the cylindrical design. Captures almost all of the lumens emitted by light source, which speeds up harvest time

-The cylinder rotates slowly through the feeding trough allowing plants medium to absorb only the water and nutrients needed.

-Produce high yield plants through effect on plants being constantly rotated, 360 degrees is known as an abscisic acid. This effect combined with gravity's influence on plants, compresses the plant, producing more internodes or flowering sites.

**-Lettuce Case Study**  
CFL (in Kilowatts per Hour (KWH))  
2 week total: 3446.4 KWH to produce 2300 units of Lettuce.  
Per Lettuce Unit = 0.76 KWH

**-Basil Case Study**  
CFL (in KWH)  
4 week total: 3292.8 KWH to produce 900 lbs Basil leaves  
Per lb. of Basil leaves = 3.7 KWH  
15 units for KWH X 3292.8 = \$49352. - 900 lbs basil x \$7/lb = \$6300  
= \$43052

(Omega Gardens - Commercial Hydroponic Systems Supply Company)



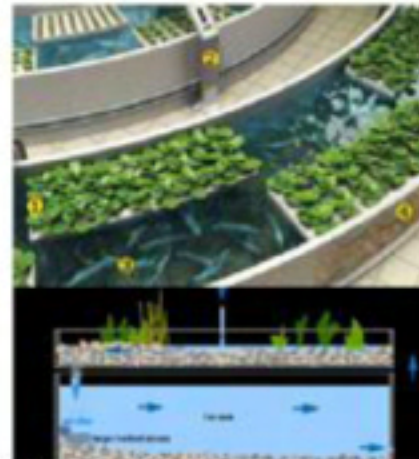
PROTOTYPE VERTICAL FARMING DESIGNS, EICKSON DESPOMMER AND COLUMBIA UNIVERSITY STUDENTS



PROTOTYPE VERTICAL FARM-EICKSON DESPOMMER 1999



EDITT TOWER, SINGAPORE. TE HAMZAH AND YEANG



AQUAPONIC GROWING SYSTEM

THE AQUAPONIC MERRY-GROW-BOWNS Graham Mordock

As hydroponic systems are used in conjunction with aquaponics, the system is able to produce high-maintenance.

Soilless hydroponic systems require frequent nutrient replenishment, and fish tanks need constant flushing of filtered water.

The fish waste becomes plant fertilizer, while the plants clean the dirty water.

As the plants grow, they absorb the nutrients from the water, and the fish waste becomes plant fertilizer (2) and, by the end of the weeks-long trip, the plants are ready for harvest.

Before there even high protein sludge (3), whose ammonia takes waste into a gravel bed (4), where bacteria convert it to nitrogen.

The system pumps this nitrogen-rich water to the plants, which consume the nitrogen and return clean water to the fish.

Farmers already score produce yields using hydroponic tactics that are 30 times as high as those produced by traditional farming.

In a vertical farm, nutrient-delivery machinery and 24-hour light exposure would improve on that yield many times over.

(Graham Mordock, "Farming in the Sky")



CULTURAL CORRIDOR ALONG SITE (B.R.A. DRAWING)



BELOW GRADE PARKING PLAN (B.R.A. DRAWING)



FIGURE GROUND DIAGRAM



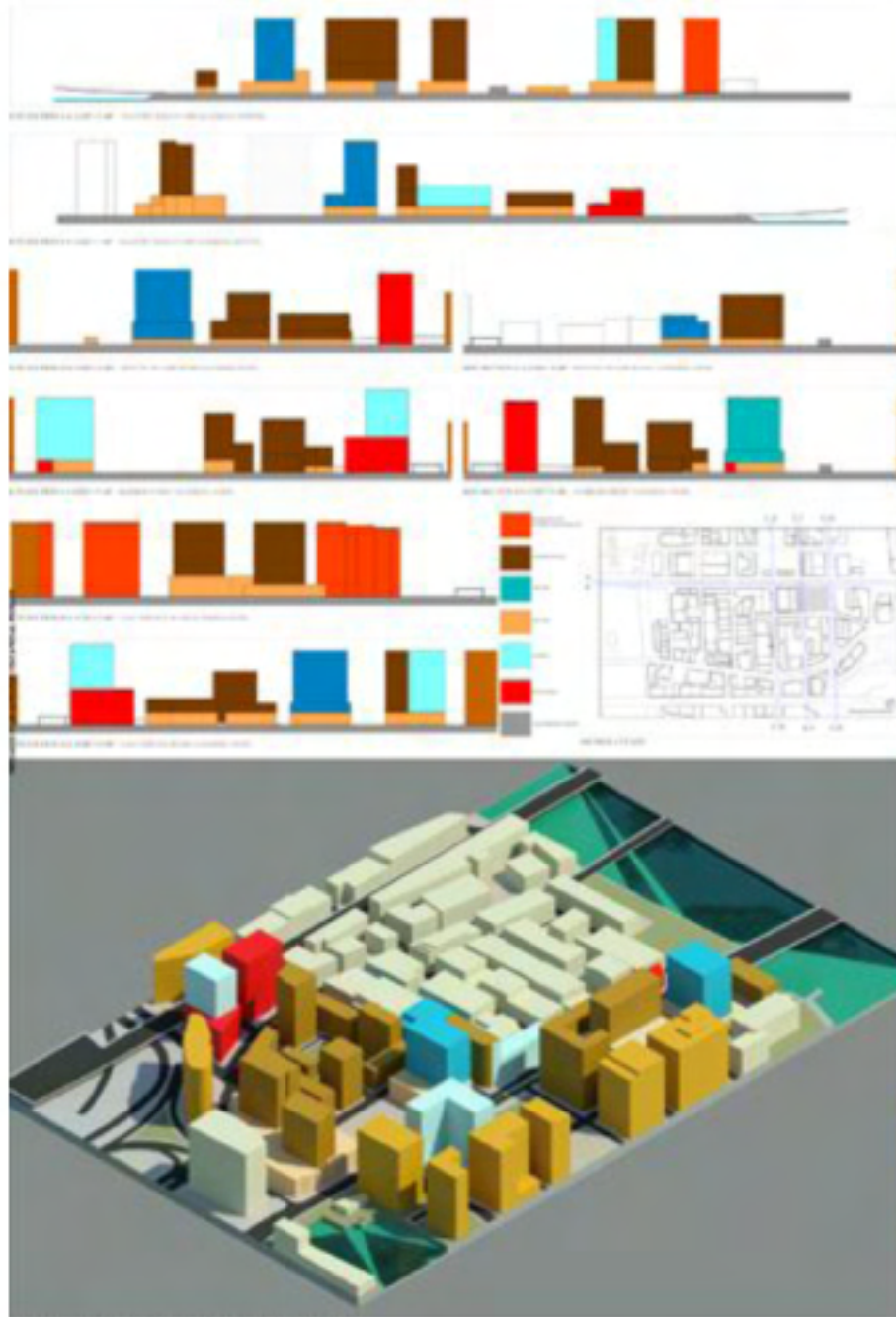
SITE PLAN @ 1/4" = 1'-0"

## SITE CONTEXT, SELECTION, & ANALYSIS

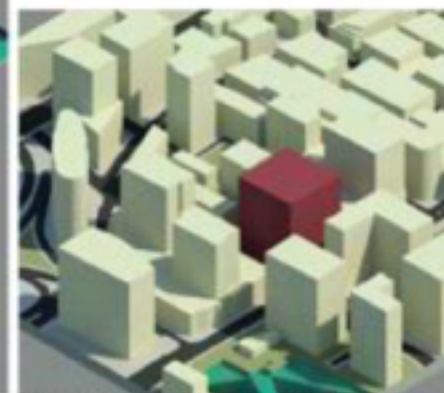
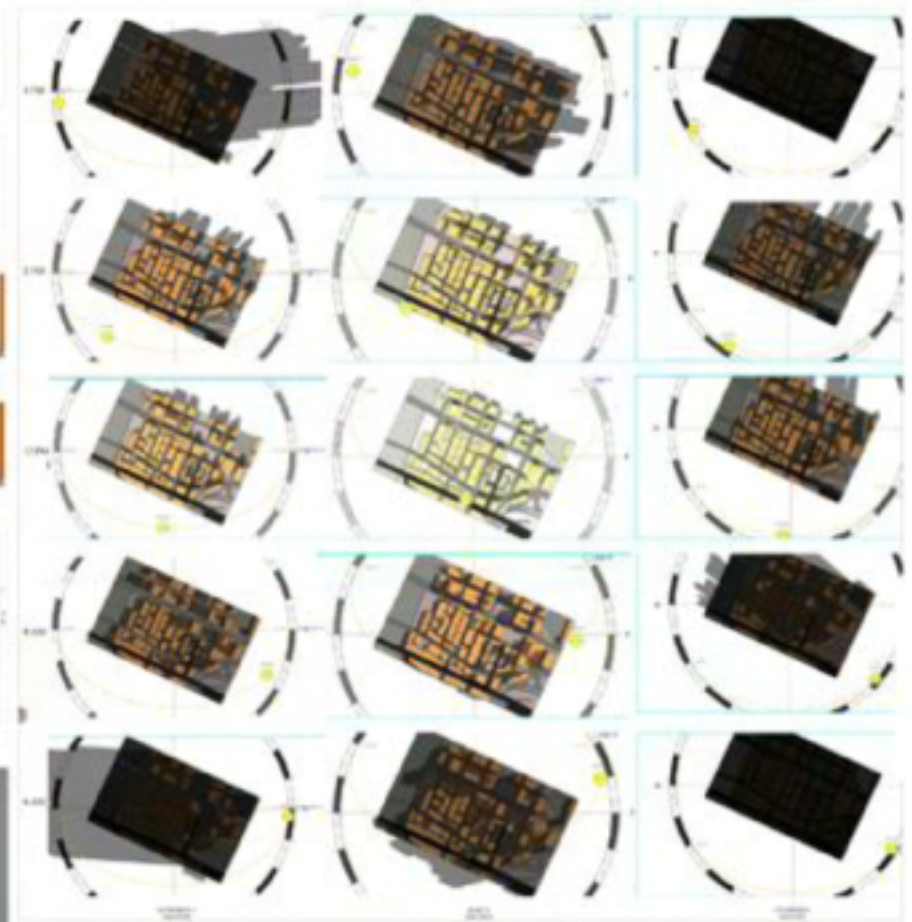
THESIS DESIGN BY ZACHARY SILVIA - ROGER WILLIAMS UNIVERSITY  
SEAPORT BOULEVARD BOSTON, MA (WITH B.R.A. REDEVELOPMENT PLAN)  
MIX-USE DEVELOPMENT FOCUSING ON COMMUNAL LIVING THROUGH VERTICAL FARMING







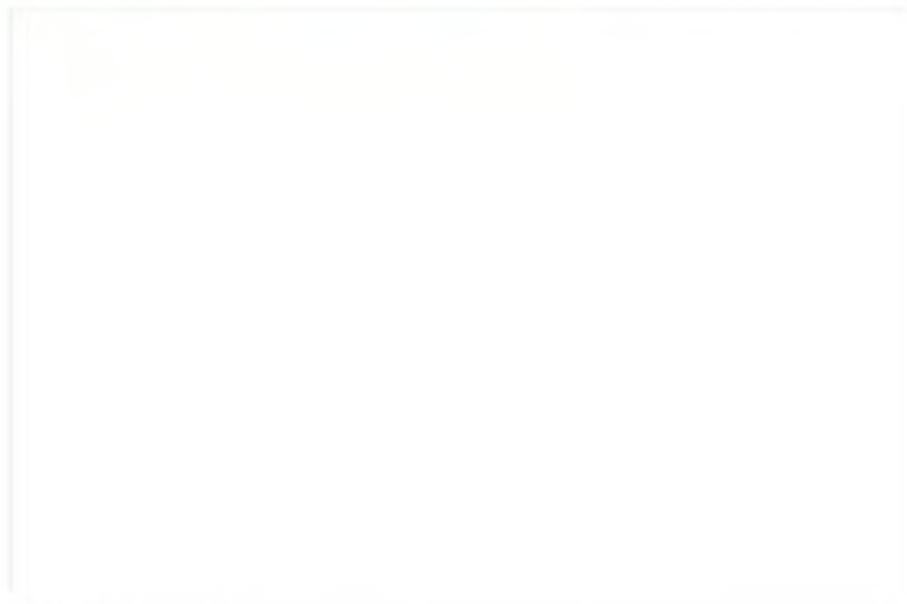
AERIAL PERSPECTIVE OF SURROUNDING PROGRAM



AERIAL VIEW OF ALLOWABLE BUILDING SIZE



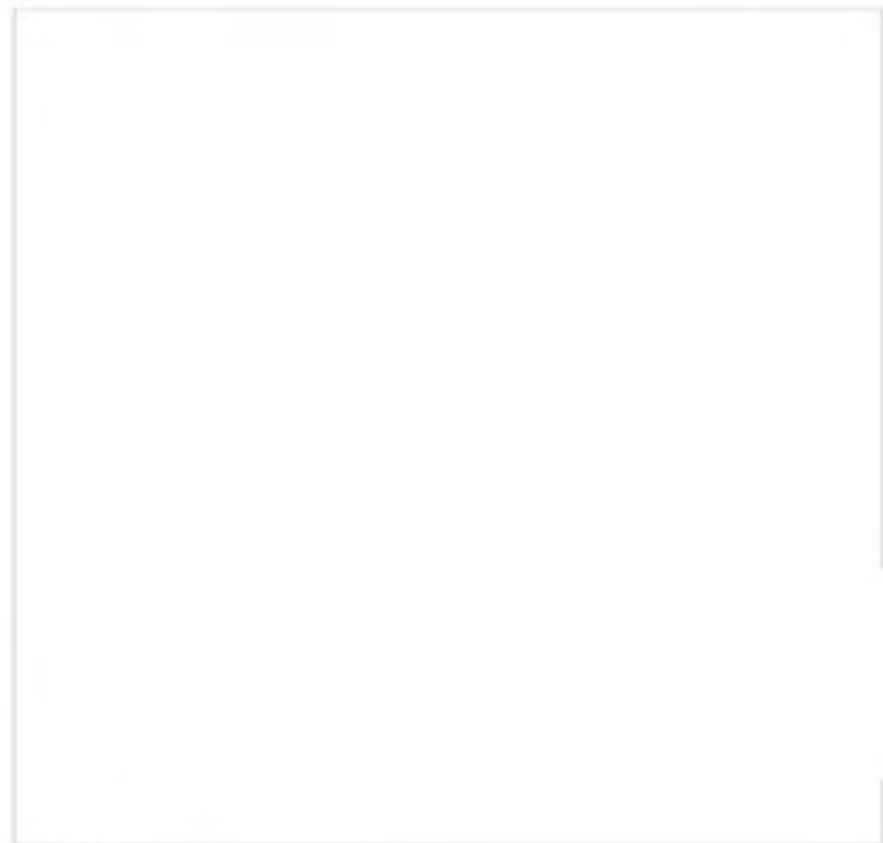
CIRCULATION AROUND ALLOWABLE BUILDING FOOTPRINT



SECOND LEVEL PLAN @ 1/8" = 1'-0"



GROUND LEVEL PLAN @ 1/8" = 1'-0"



RAMP RENDER

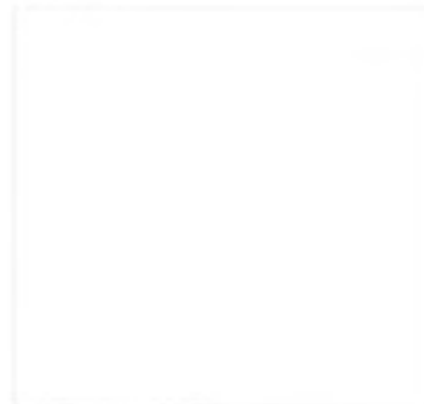
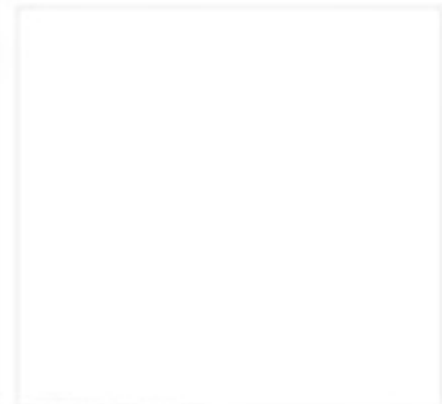


DIAGRAM PARK AND ENTRY



PARTICULAR DESIGN

**PUBLIC MEETING SPACE, MARKET, & RESIDENT'S GREENHOUSE**THESIS DESIGN BY ZACHARY SILVIA - ROGER WILLIAMS UNIVERSITY  
SEAPORT BOULEVARD BOSTON, MA (WITH U.S.A. REDEVELOPMENT PLAN)  
MIX-USE DEVELOPMENT FOCUSING ON COMMUNAL LIVING THROUGH VERTICAL FARMING





DIAGRAM

DIAGRAM

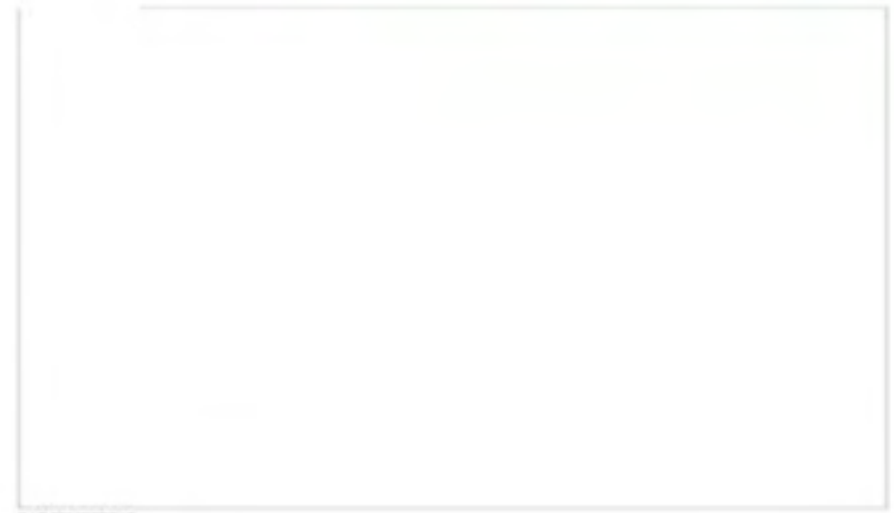


TH LEVEL PLAN @ 1/32" = 1'-0"

DIAGRAM



THIRD LEVEL PLAN @ 1/32" = 1'-0"



RAW RENDERING

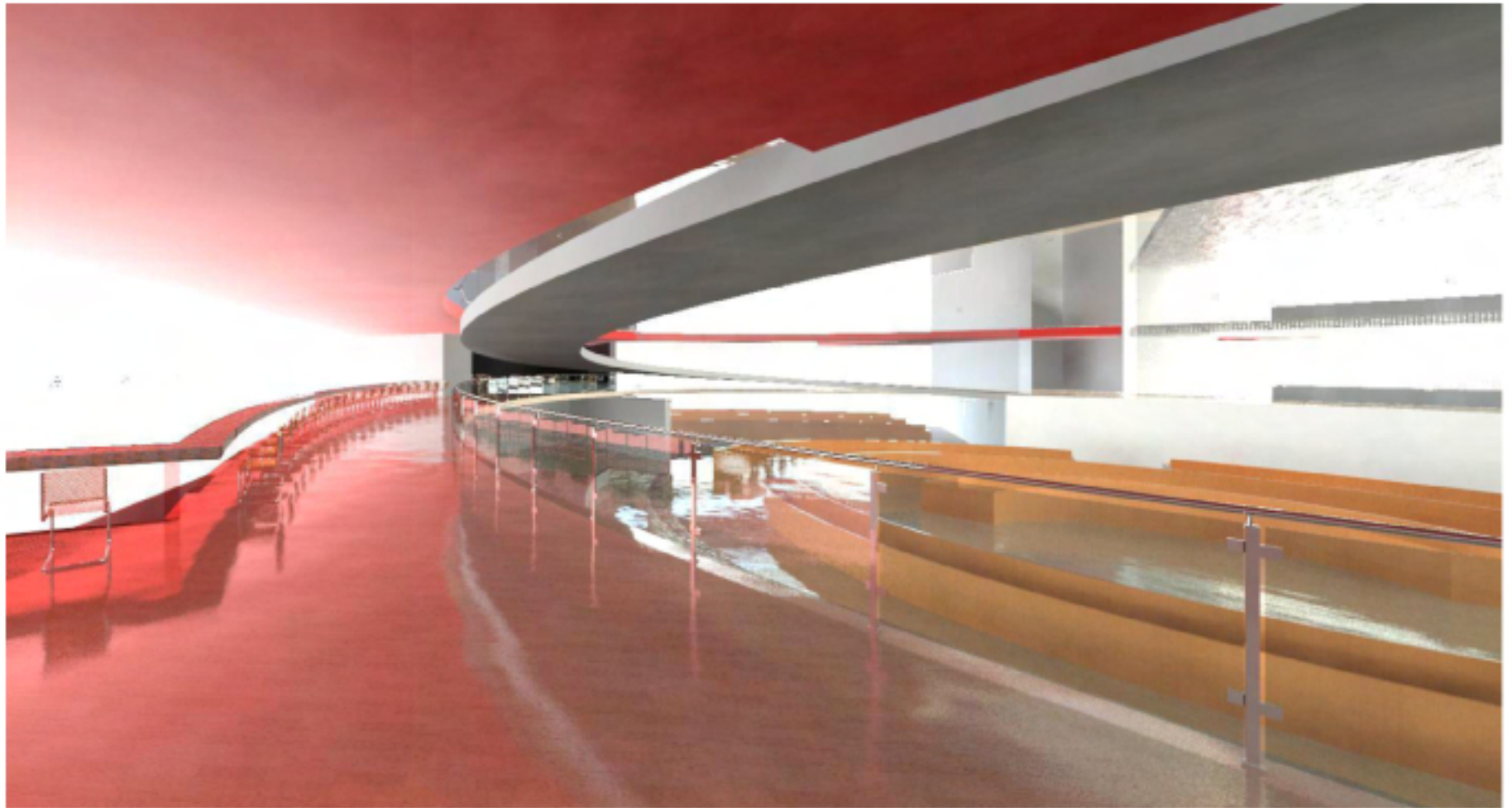


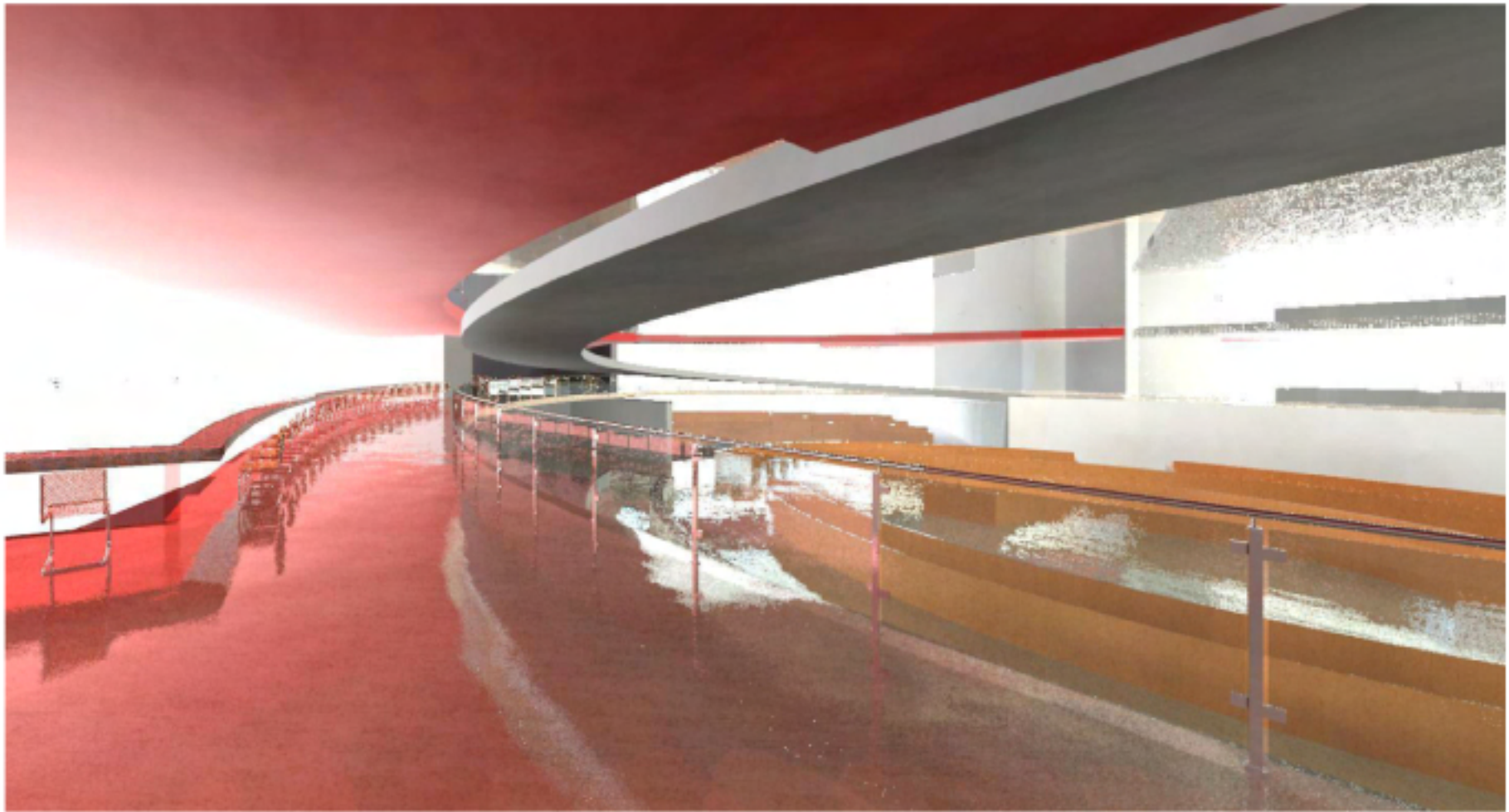
DIAGRAM PARK AND ENTRY

PARTICULAR DESIGN











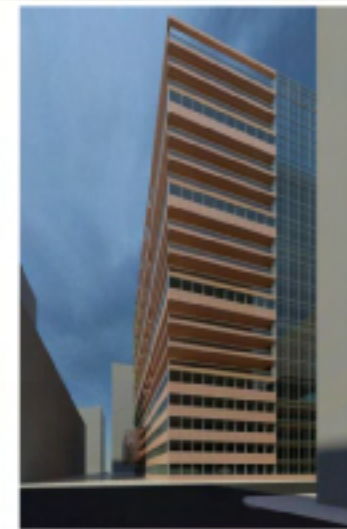
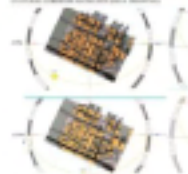
## **Appendix D- Final Presentation**

The following sheets were presented at the final presentation for the thesis project. Much work had been done to get to the final design since, which was seen in the Final Design section of the document. The vertical sheet layouts were presented on 72x36" sheets and the horizontal on 36x48" sheets. The renderings and plans are different from the final design used in the document, but show the design in its developing stage.

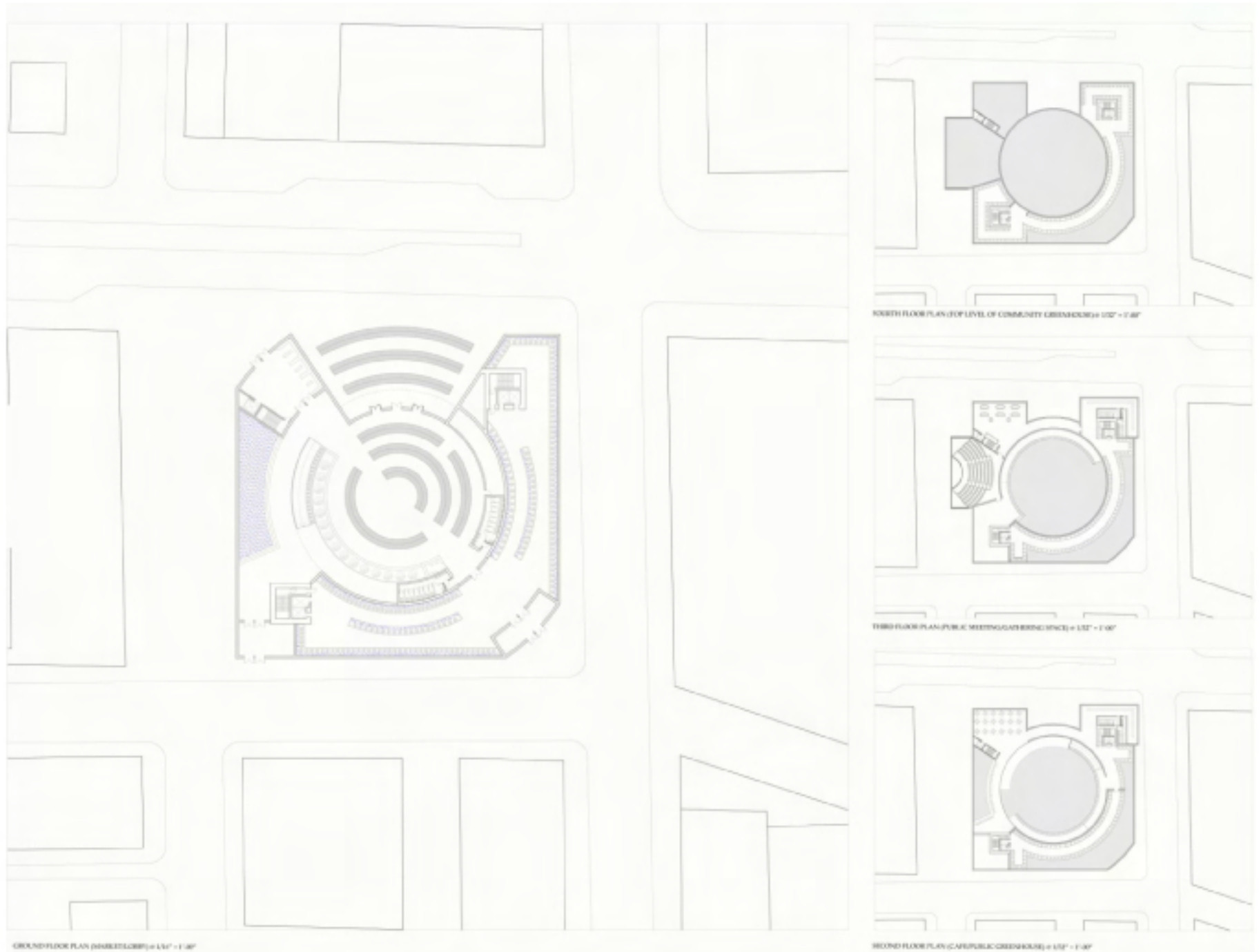
## AN ALTERNATIVE CITY LIVING

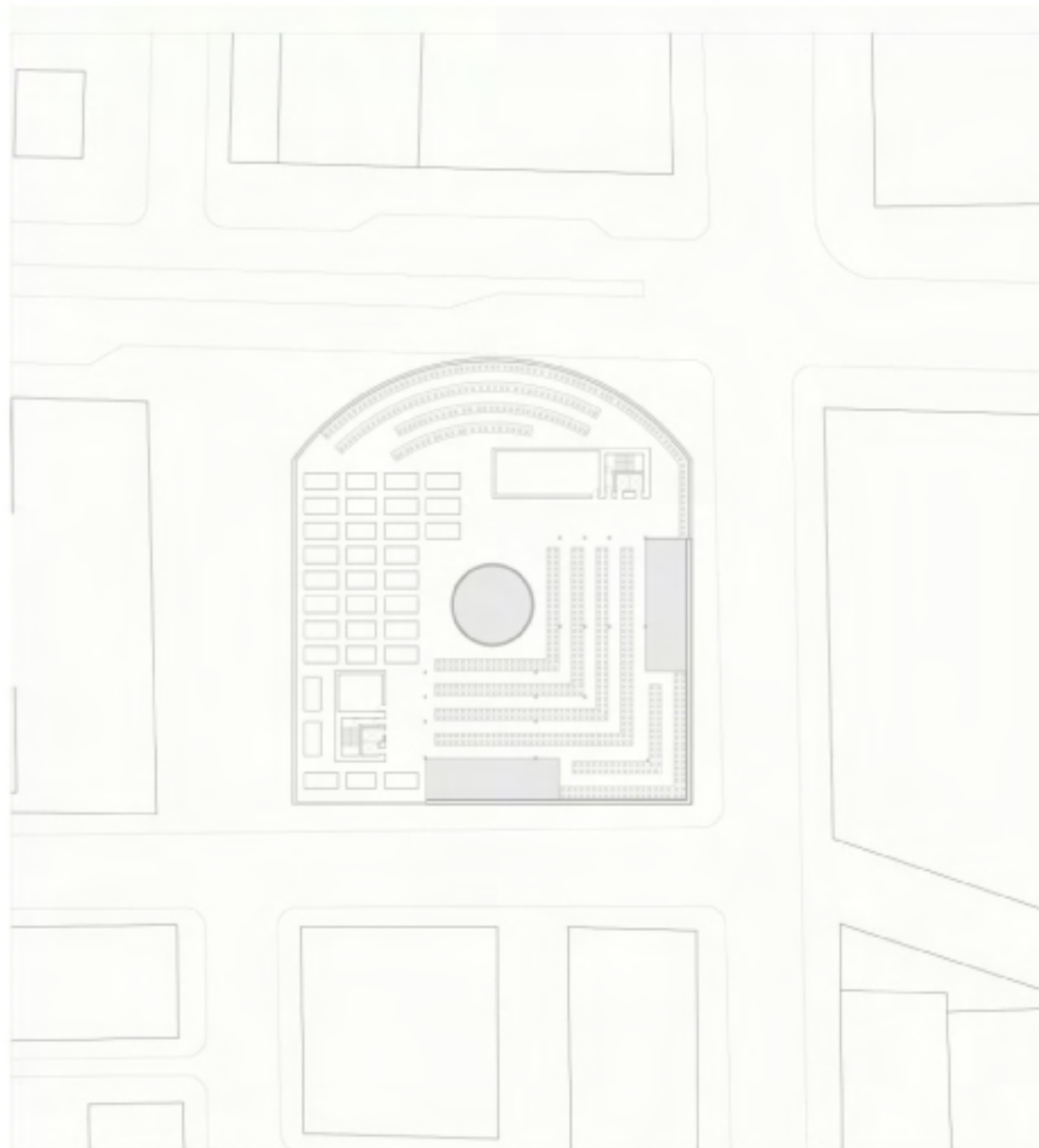
THE DESIGN OF A MIX-USE BUILDING FOCUSED ON COMMERCIAL LIVING THROUGH VERTICAL FARMING

The project is a conceptual design for a new building in the heart of the city. The building is designed to be a mix-use building, focusing on commercial living through vertical farming. The building is designed to be a mix-use building, focusing on commercial living through vertical farming. The building is designed to be a mix-use building, focusing on commercial living through vertical farming.



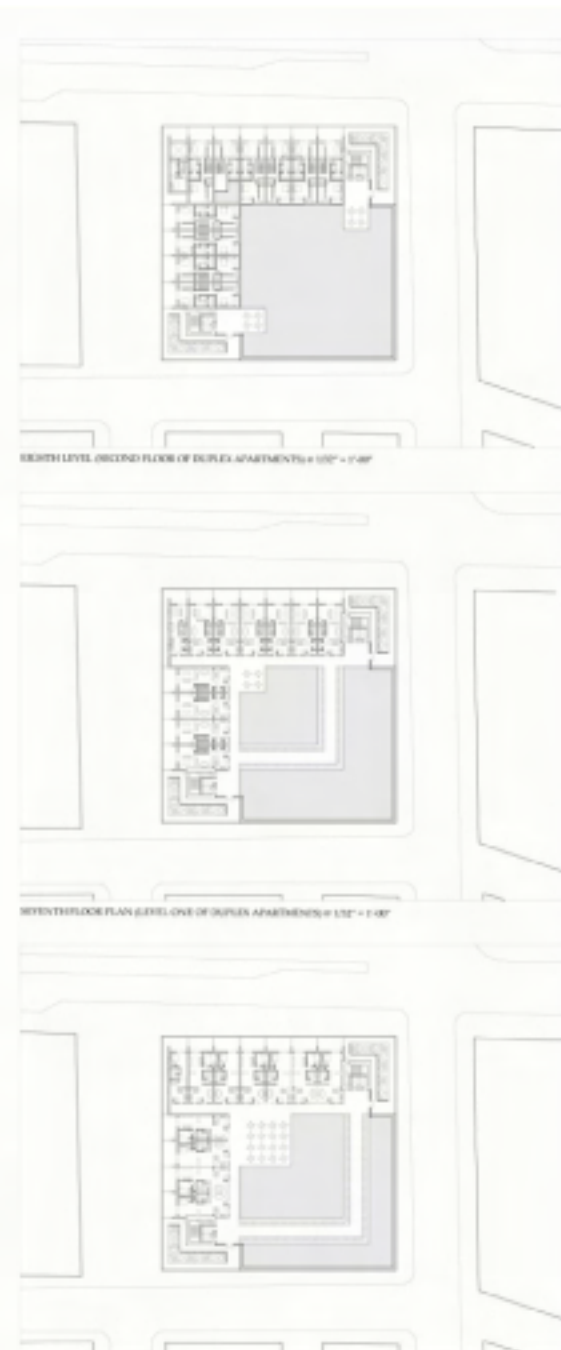






FIFTH FLOOR PLAN (AUDITORIUM ZONE OF CLUSTER) 1/4" = 1'-0"

XIII



SIXTH LEVEL SECOND FLOOR OF DUPLEX APARTMENTS 1/32" = 1'-0"

SEVENTH FLOOR PLAN (LEVEL ONE OF DUPLEX APARTMENTS) 1/32" = 1'-0"

SIXTH LEVEL PLANT AND GROWING LEVEL FROM 1/32" = 1'-0"

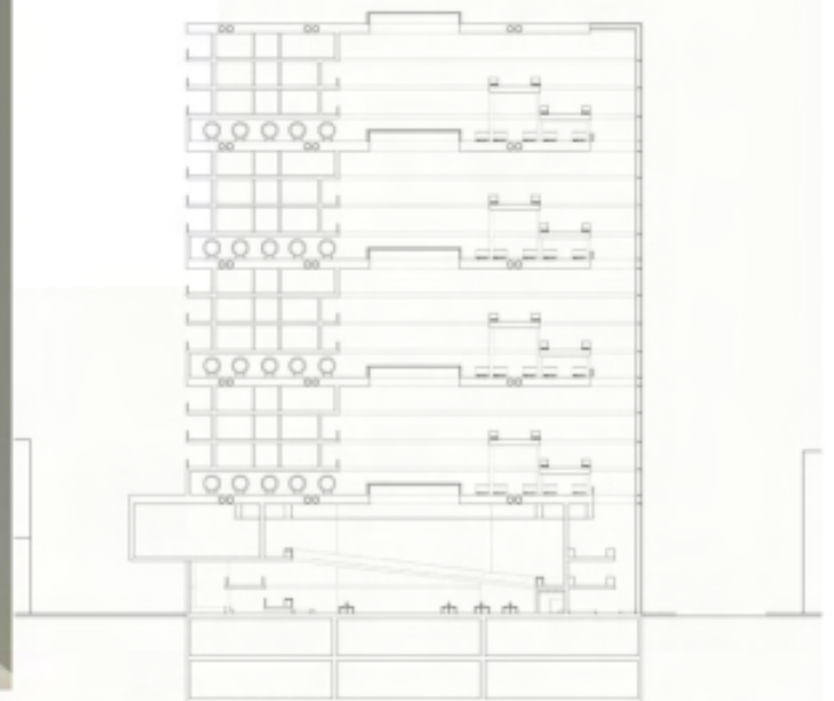




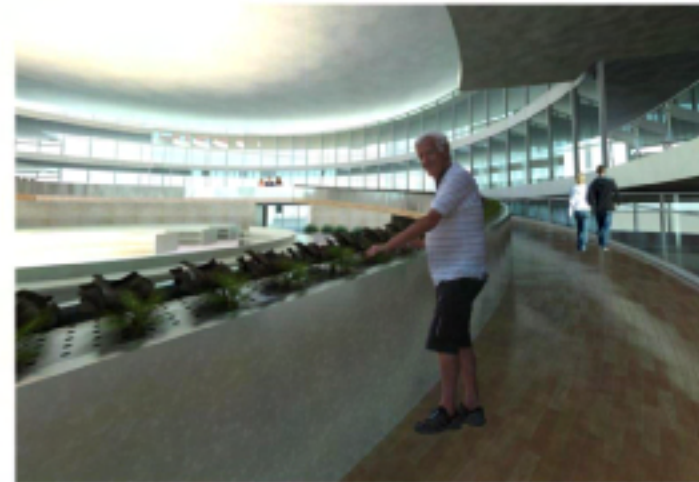
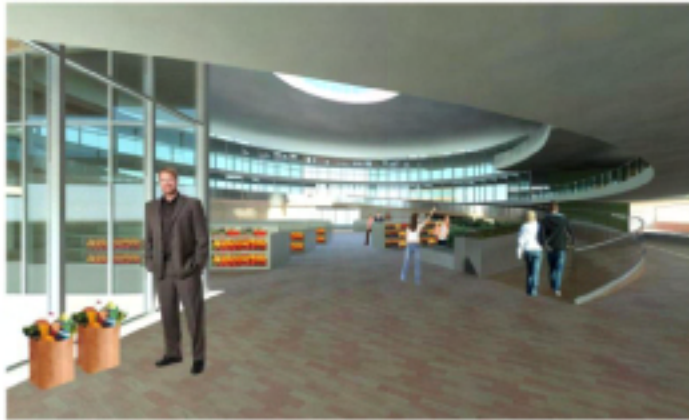
SOUTHERN CORNER (GREENHOUSE)



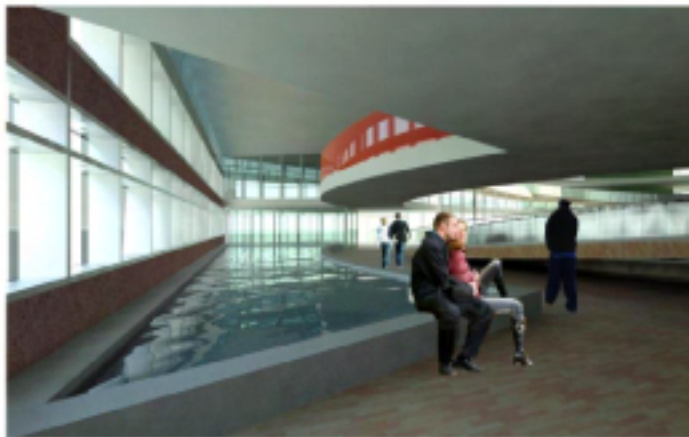
ENTERING THE MARKET



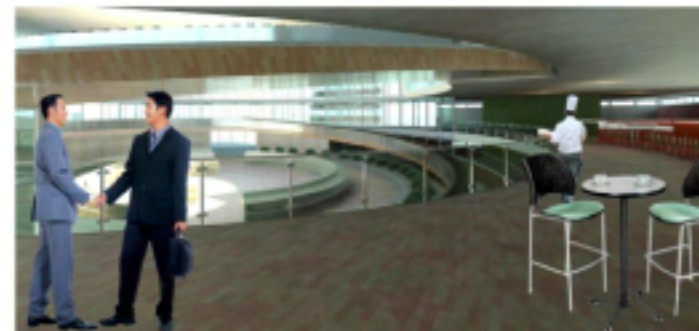
SECTION @ 1/16"=1'-00"



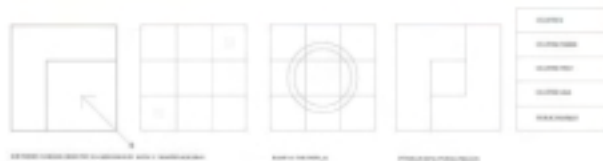
VIEW ON RAMP



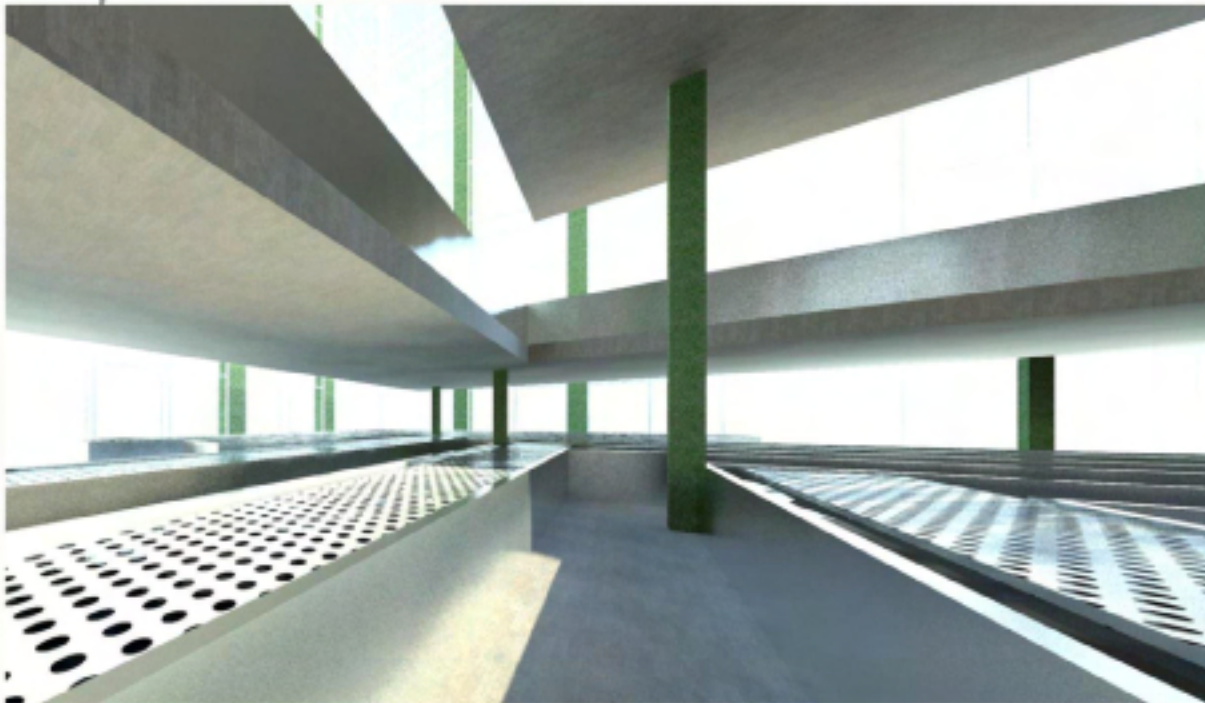
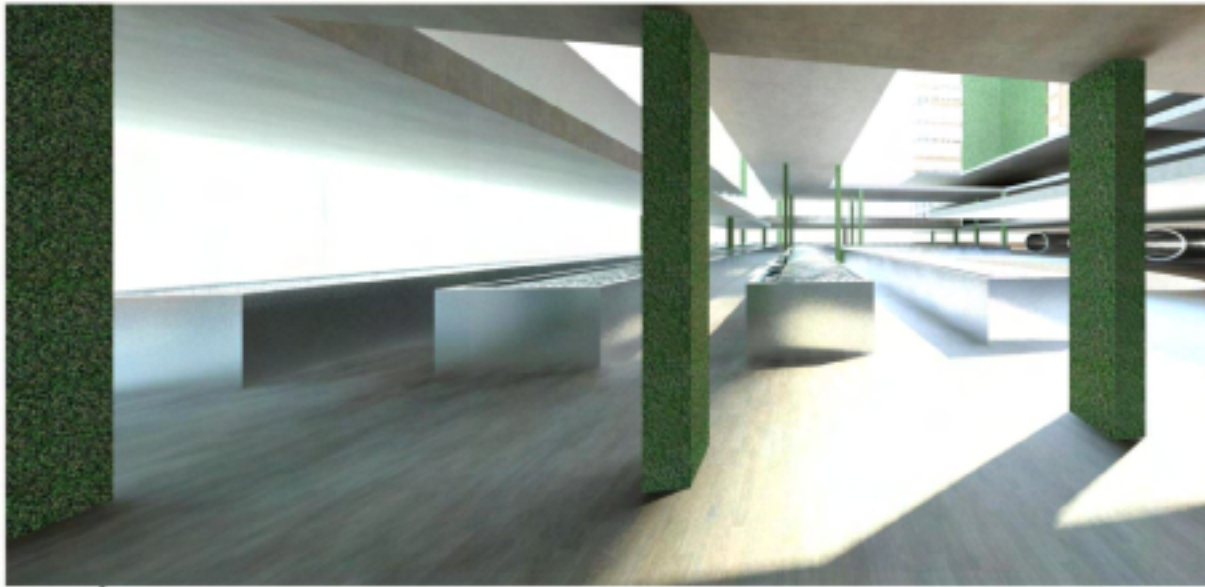
VIEW ON RAMP



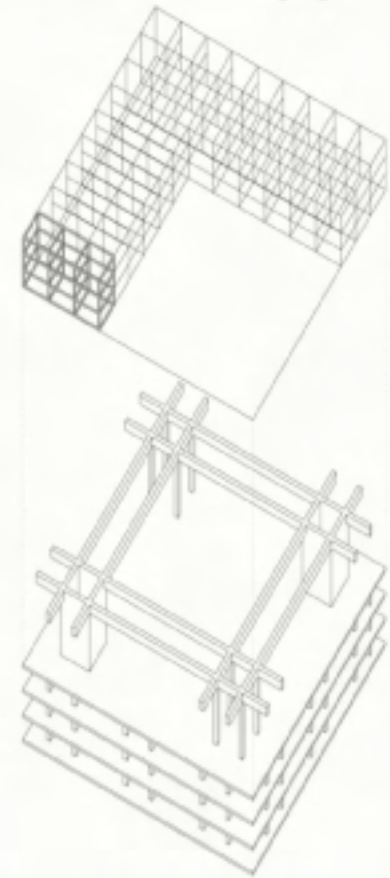
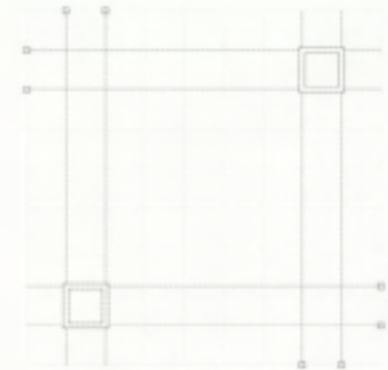
VIEW IN THE CAFE LOOKING DOWN TO MARKET



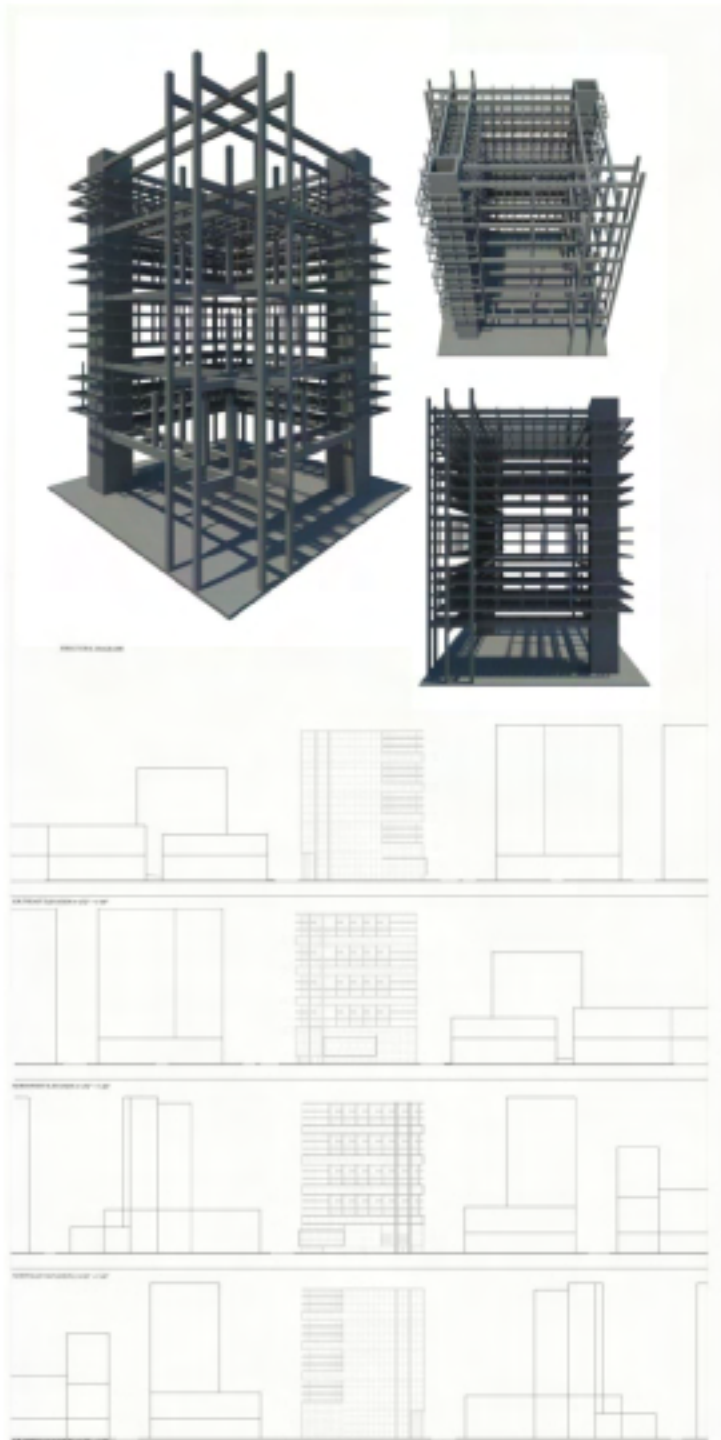




GREENHOUSE LEVELS



STRUCTURAL CONCEPT





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