# • Adaptive Reuse • Real Estate Development • Land Reclamation •

# Richard Sa Portfolio

# • Materials • BIM • Biomass Energy • Zoning • Farm -to- Table •

**Richard Sa** **MSAAD 2022**

**Graduate School of Architeture, Planning and Preservation**

**Columbia University**

## What doesit mean to practice as a contemporary architect?...

**During the last half-century the world's population has become more prosperous and grown exponentially, placing unprecedented strain on the environment that challenge the ability of the earth to sustain itself. Architects respond to these evolving challenges by creating spatial strategies, new typologies, and developing new data-driven technologies. With this comes a debate what it means to practice as a contemporary architect.**

**Architecture can be the art of unexpected combinations. More than ever the profession should create opportunity by embracing an interdisciplinary approach. These projects illustrate various approaches to design thinking through the lens of environmental impact, data-driven technology, and real estate development.**

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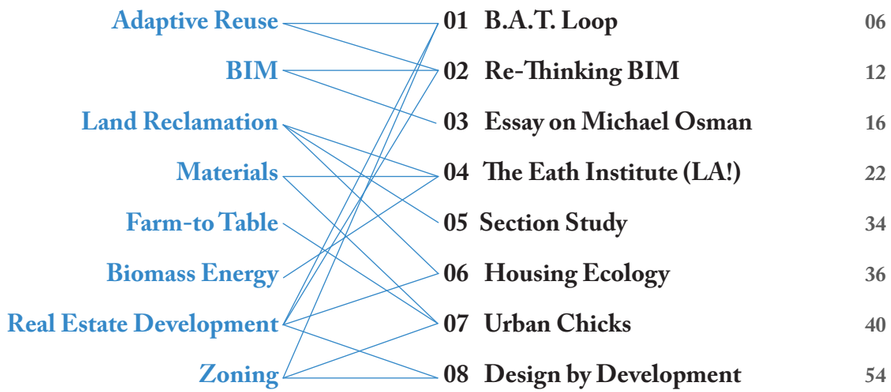


# Adaptive Reuse





**An understanding of preservation as an evolutionary process may be a solution for the contemporary city. These two project explore the adaptive reuse of the Brooklyn Army Terminal and the Long Lines Building. These projects attempt to understand-preservation to be an active process rather than a static idea.**

01

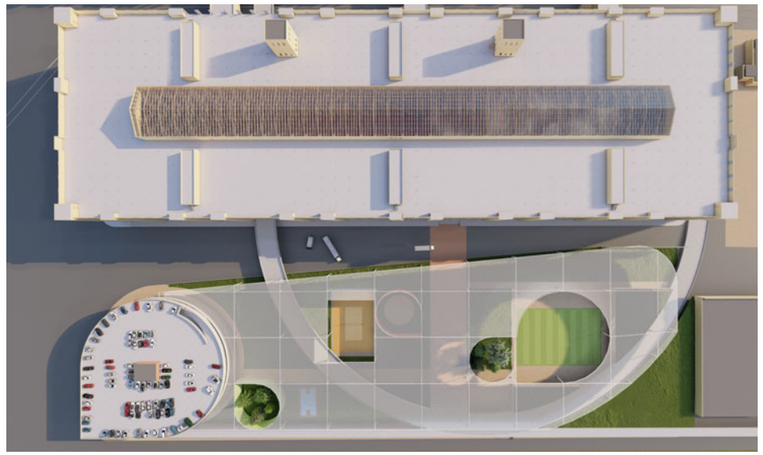
# THE B.A.T. LOOP

Brooklyn Army Terminal

LOCATION Brooklyn, New York
TYPE Master Plan
SIZE 4,000,000 sf.²
INSTRUCTOR Laura González Fierro
Summer 2021

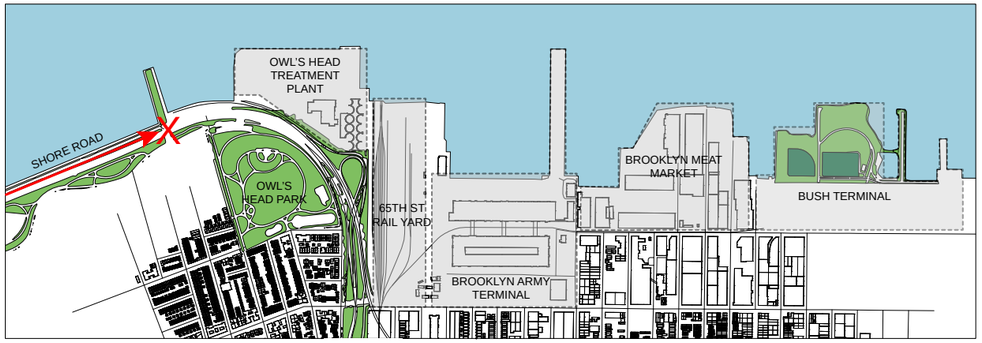
With access to parks and a recreational waterfront, higher income residents of Bay Ridge enjoy clean air and outdoor activities. Separated by highway infrastructure, the neighboring lower income district of Sunset Park lack accessibility to greenspace. The Brooklyn Army Terminal (B.A.T.) is located at the border between these two districts. The B.A.T. loop introduces a circulation route connecting communities through public space, sports, and a library. The loop encourages movement of people and knowledge as well as the movement of goods. By introducing new programs, the loop aims to be a place for exchange of knowledge and keep the Brooklyn Army Terminal as a manufacturing hub.

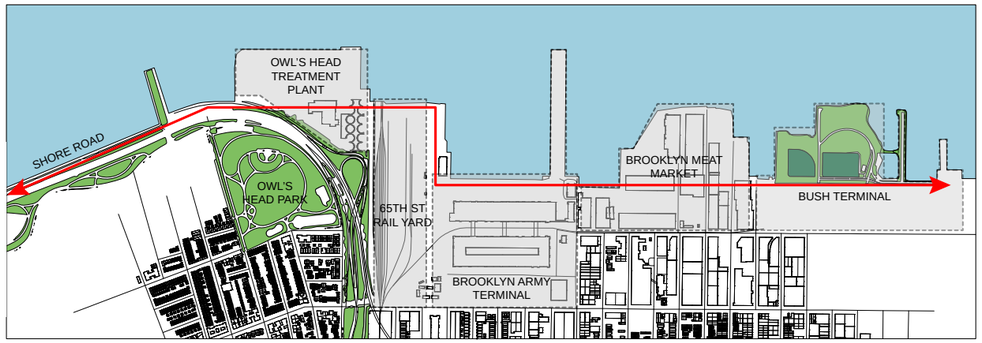




Roof Plan

Floor 1 Plan


OWL'S HEAD TREATMENT PLANT
SHORE ROAD
OWL'S HEAD PARK
65TH ST RAIL YARD
BROOKLYN ARMY TERMINAL
BROOKLYN MEAT MARKET
BUSH TERMINAL


OWL'S HEAD TREATMENT PLANT
SHORE ROAD
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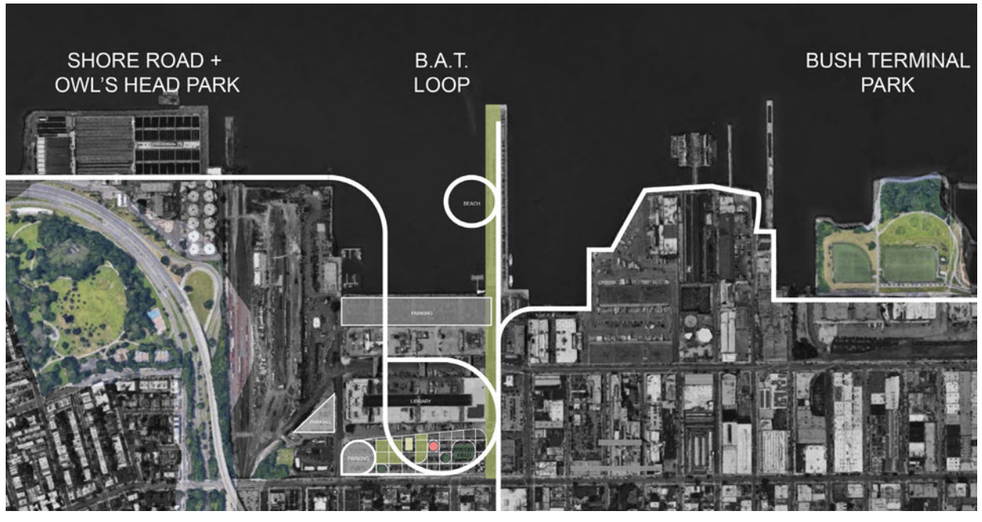
65TH ST RAIL YARD
BROOKLYN ARMY TERMINAL
BROOKLYN MEAT MARKET
BUSH TERMINAL


SHORE ROAD + OWL'S HEAD PARK
B.A.T. LOOP
BUSH TERMINAL PARK


Adapt Ability

A new axis is defined – a brick path that continues into the interior atrium space re-programmed as a public library. The axis carries the city into the grand atrium space, once used for cargo shipment. A great sunlit space for a reading room.

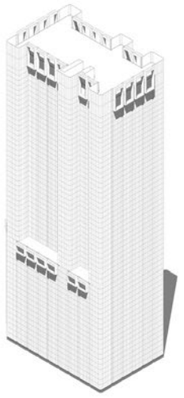
The ultimate meaning of the loop is not to be an object or a single park, but the central element that connects the community of tenants fostered at the Brooklyn Army Terminal to the city at large; a center between Sunset Park, Bay Ridge, and the waterfront.

# 02
# RE-THINKING BIM

## Conversion of Long Lines Building

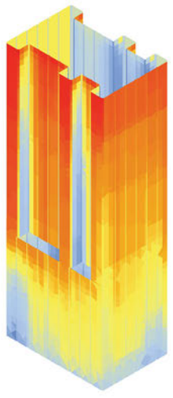
GSAPP Visual Technology Elective
Instructor: Mark Green
Partners: Ata Gun Aksu, Han Kuo
Fall 2021

EXISTING



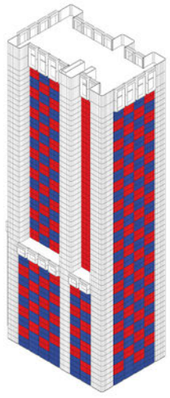
The façade at 33 Thomas Street, formerly known as the AT&T Long Lines Building, reflects the original use of the building. The windowless skyscraper was used for telephone exchange. The façade is made of precast concrete panels clad with granite.

SOLAR ANALYSIS



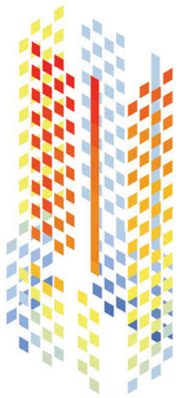
The upper floors of the facade capture most of the sunlight. In this diagram, red represents the most time exposed to the sun. While blue represents the least amount of time exposed to sun.

PATTERN



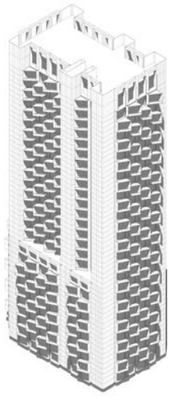
Our proposal is to convert 33 Thomas Street into a residential tower. The facade is divided into an alternating pattern to allow for flexibility in design for residential units. This alternating pattern always allows for a living room and bedroom to be next to one another.

SOLAR ANALYSIS GRID

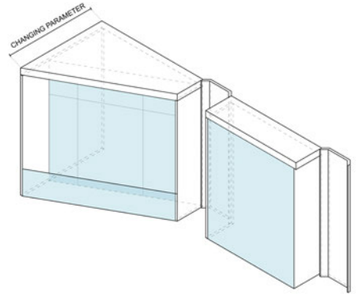


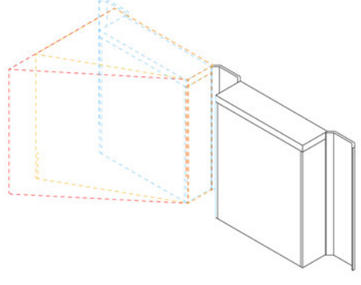
By extraciting the living room modules we are able to see how much sunlight each living room captures during the day.

RESIDENTIAL UNIT

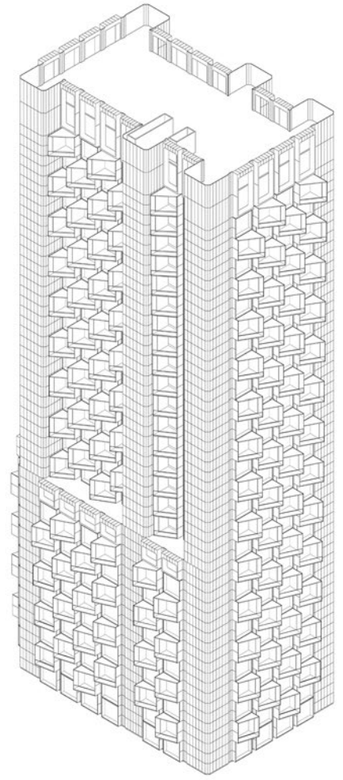


The living rooms of each unit would include a balcony. This balcony is the changing parameter within our design process. The protrusion of the balcony adjusted according to how much sunlight each space captures.

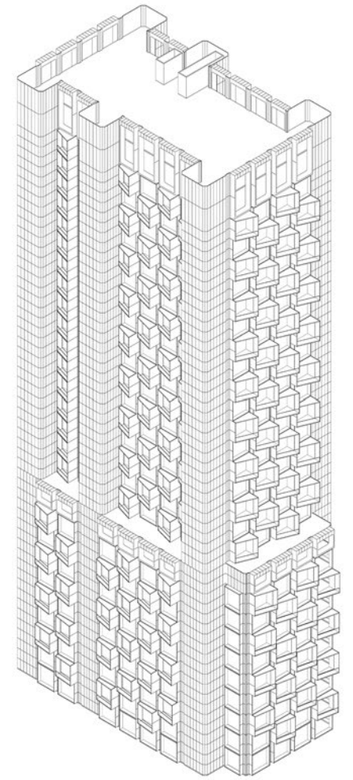


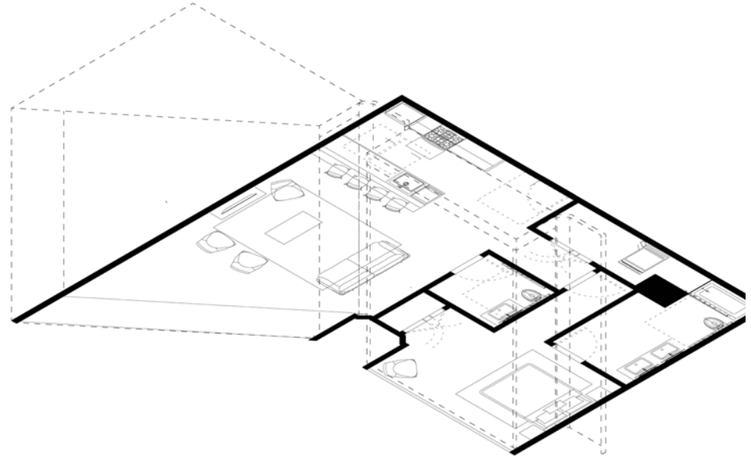




SOUTH FACADE



NORTH FACADE



# BIM





**How can data drawn from BIM tools drive design?**
**What are the limits of BIM?**

# 03
# Essay on Michael Osman

Looking at the Space Between Architects and Contractor: Past, Present, and Future

GSAPP Arguments
Instructor: Andres Jaque, Pedro Correra Fernandez
Summer 2021

With the emergence of technology and information, the role and agency of architecture is rapidly changing and adapting. Artificial Intelligence, BIM, social media are transforming practice socially, politically, and economically. To move forward architects will need to address this new emerging position through practice and discourse.  As Michael Osman points out, architects may need to take a humble approach and learn from the architects of the 19th Century. He envisions a position not of superiority but one of collaboration and engagement with other professions. As many areas of traditional labor are becoming increasingly automated, many questions on the role of the architect and contractor begin to emerge. Osman's text on specifications seeks a closer examination on the relationship between the architect and the contractor/fabricator. To further understand architectural design's discipline, it is important to look at past, present and future through an examination of the process of built works.

**Past – Master-Builder**
By looking at the etymology of the word architect, we begin to see that the role of the architect is not clearly defined. Architeckton or arkhi-tekton is the Greek word for master-builder. Today architect is defined as a producer of drawings/models and advisor for construction but not builders.



Osman notes that 19th Century industrial society begins to make a distinction between the mind and hand or art and craft. Osman speaks of the underlying assumption of a hierarchy between the creative white-collar worker and non-creative blue-collar worker and argues that written specifications served as the written document that asserts this distinction of the architect as the creative/intellectual.

**Present - "I have nothing to do with the workers"**
In recent years, discourse on the relationship between the architect and the contractor have begun to emerge in universities as architecture has become increasingly global and complex. Through technology, architects can use communication tools to work abroad in the Middle East, Asia, and Africa. Beyond physical distance, architects also face a cultural distance. Questions of ethical responsibility of the laborers in a foreign country begin to emerge. The group WBYA? (Who Builds Your Architecture?) is a coalition of architects, activists, scholars and educators ask a similar question posed by Osman: "who pays for your creativity?". WBYA? address the lives and livelihood of those who are often forgotten in the professional practice: the migrant worker. The material that the architect specifies in the form of construction documents and/or BIM model is a start to complex global network that ends with a migrant worker. In 2014, during the construction of Al Wakrah Stadium, Zaha Hadid claimed "I have nothing to do with the workers" after a journalist asked her about migrant construction worker deaths. Zaha Hadid's comments regarding the dangerous labor practices of migrant workers in Qatar reveal a disconnect many architects have from their design to the builder.

Like many other industries, automation has led to questions of a bleak future of obsolescence of the builder. “Chi She” by Archi-Union Architects uses an intricate brick pattern is laid by a robotic arm on the construction site. Although there is an innovation in the use of software and robotic arm, a traditional brick is still used as “standard” material. Do we even need bricklayers anymore?

**Future – Slow Innovation**

Currently, BIM technology, clerical work is integrated into the design process. For example, every material inputted into BIM software is associated with a cost. The architect can work in conjunction with the budget rather than waiting for a cost estimation by the contractor. In this instance “clerical data” can speed up the process making design more efficient.  In this example, data is used as a supplement for design, how can it be a driver for design? New technologies are still in early stages and have not matured. As we head into the future architects should ask how can these tools of “clerical data” move beyond efficiency and provide innovation in the field of architecture? As technology gets more advanced Osmon envisions that the “period of standardized mass production comes to its predicted end.” BIM technologies, 3D Printing, and robots will lead to “a digital future that overcomes standards through the equally efficient production of infinitely differentiated, customized creations.” Some architecture firms have attempted to use technology in innovative ways to produce customized architecture but a close examination of their execution prove that innovation is a slow process.

One such firm is O’Donnel + Tuomey. In 2014, O’Donnel + Tuomey designed the Saw Swee Hock Student Center for London School of Economics. The designed concept required a intricate use of traditional brick within the historic London context. It is a building that was designed with innovative softwares but crafted in very traditional techniques.



Therefore, innovative design techniques had to be communicated in very traditional construction document drawings. Can these new tools be communicated to builders in a way that is new and innovative?

As technology increasingly influence architectural practice, the profession will need to adapt. Architects may need to examine what parts of the practice are most valuable and relevant. Alternative practices that redefine the role of the architects will emerge as these new technologies begin to mature. Innovation within architecture is always going to lag behind tech industries because of the structures put in place in its history. Organizations like the AIA have set standards that would need to be addressed and re-examined. Another reason for this slow process is because architecture is inherently collaborative. A change in one industry is not enough. Collaborators like contractors and fabricators would also need to learn to adapt to these new technologies as well. To be relevant in the future, architects can no longer distance themselves from contractors. As Osmon writes, we must learn from history and perhaps return to being master builders.

Source:

1. OSMAN, MICHAEL. “SPECIFYING: The Generality of Clerical Labor.” Design Technics: Archaeologies of Architectural Practice, edited by Zeynep Çelik Alexander and John May, Univer sity of Minnesota Press, MINNEAPOLIS; LONDON, 2020, pp. 129–162. JSTOR, www.jstor.org/stable/10.5749/j.ctvtv938x.9. Accessed 11 Aug. 2021.

2. “Who Builds Your Architecture?: A Critical Field Guide.” Who Builds Your Architecture? (WBYA?), whobuilds.org/who-builds-your-architecture-a-critical-field-guide/.

# Land Reclamation





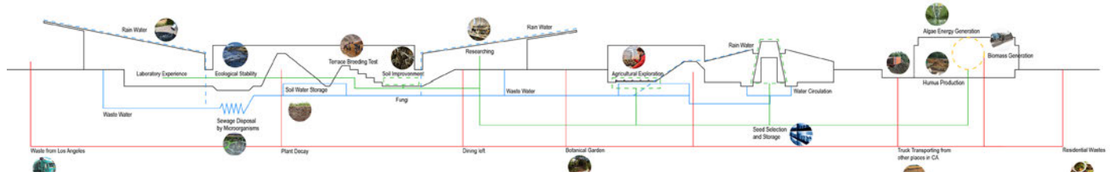
**What effect does a new development in Hong Kong have on its existing marine life ecosystem? Where does the land come from when we build new islands? How can archietcts think carefully about cut-and-fill?**

04

# THE EARTH INSTITUE (LA!)

Brooklyn Army Terminal

LOCATION Los Angeles, CA
TYPE Master Plan
SIZE 200,000 sf.$^2$
INSTRUCTOR Galia Solomonoff
in collaboration with Haozhen Yang
Spring 2022

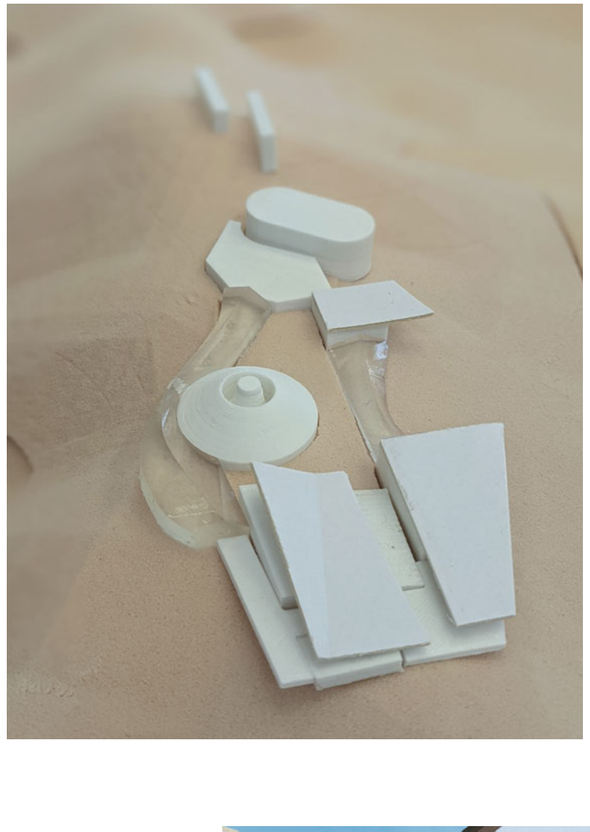


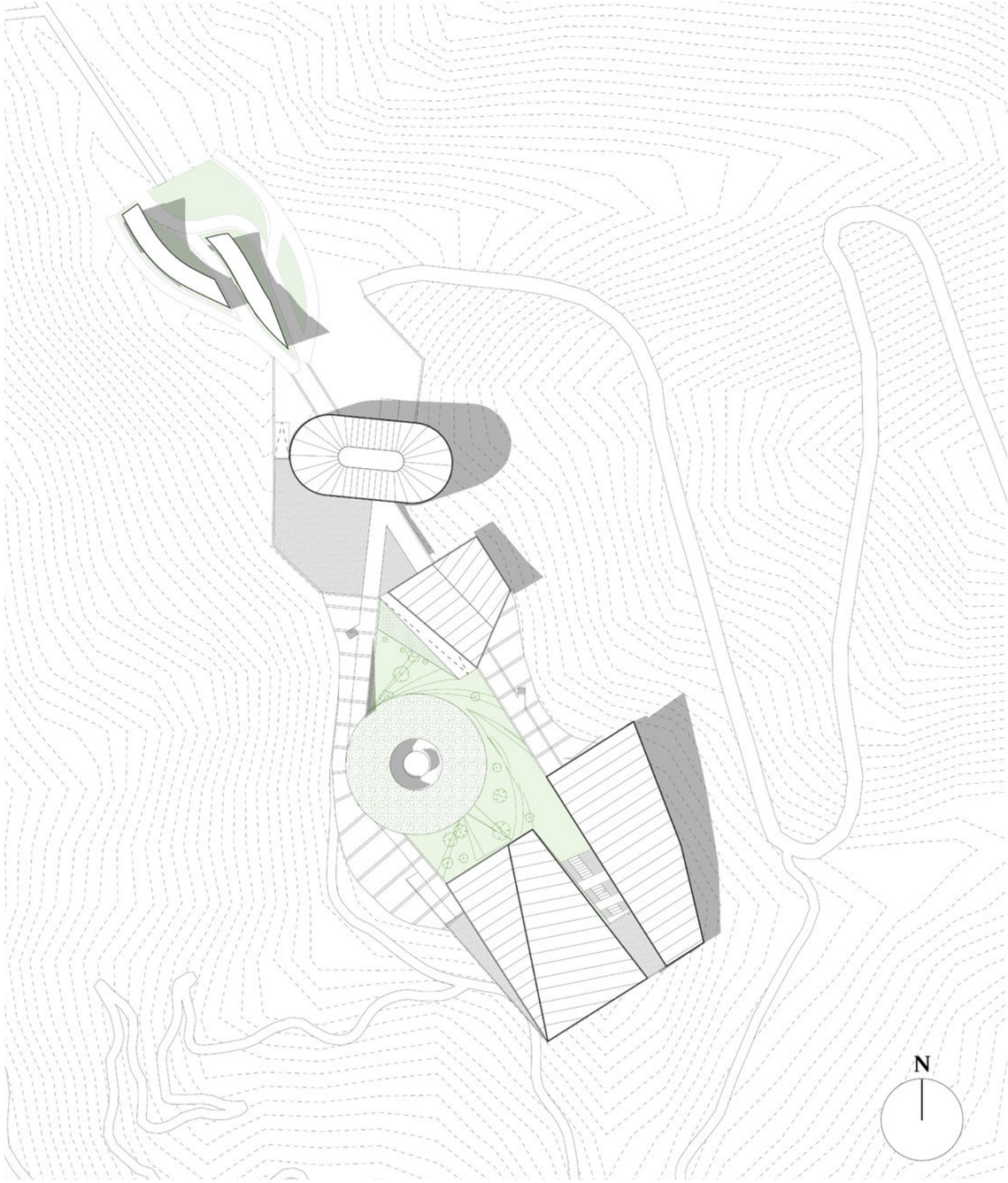

The new Earth Institute building on the hills of Los Angeles is an active campus that brings together multiple disciplines in one place. Taking advantage of the local environment and its proximity to downtown Los Angeles, this think tank is also a place of experimentation for scientists to research issues of air quality, wildfires, and drought in California.

This institution is a place for scientists and students to develop new technologies to capture CO2 emissions, reduce the use of fossil fuels in power generation, transportation and industrial processes. This is a place to develop change in every aspect of modern life from manufacturing, agriculture, and transportation. Discussions about change in every aspect of the economy would require multiple users from scientists, students, economists, and policy makers.

Our proposal introduces multiple circulation routes for these multiple users. As a place of experimentation spaces are flexible and programs overlap both visually and spatially.

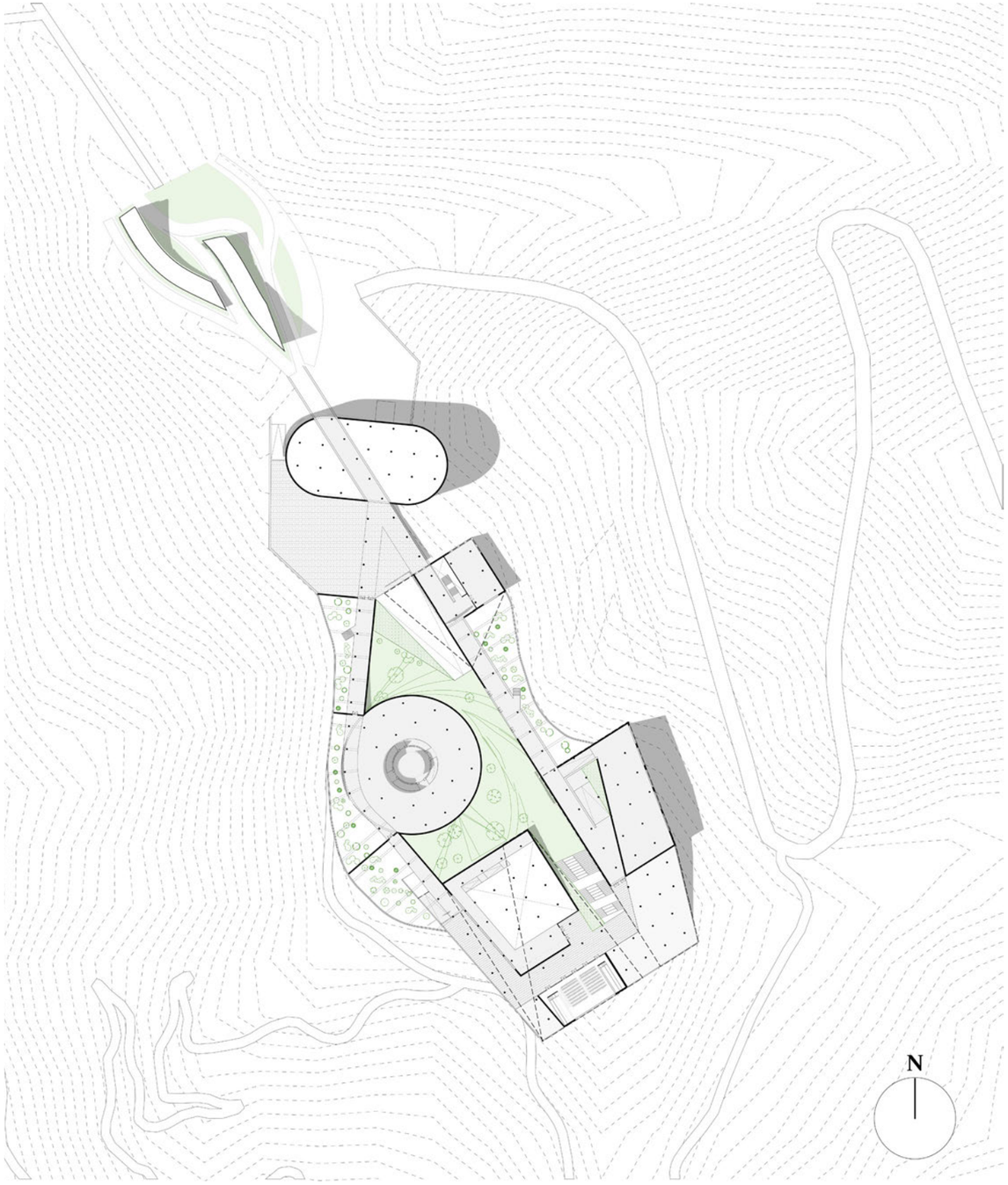




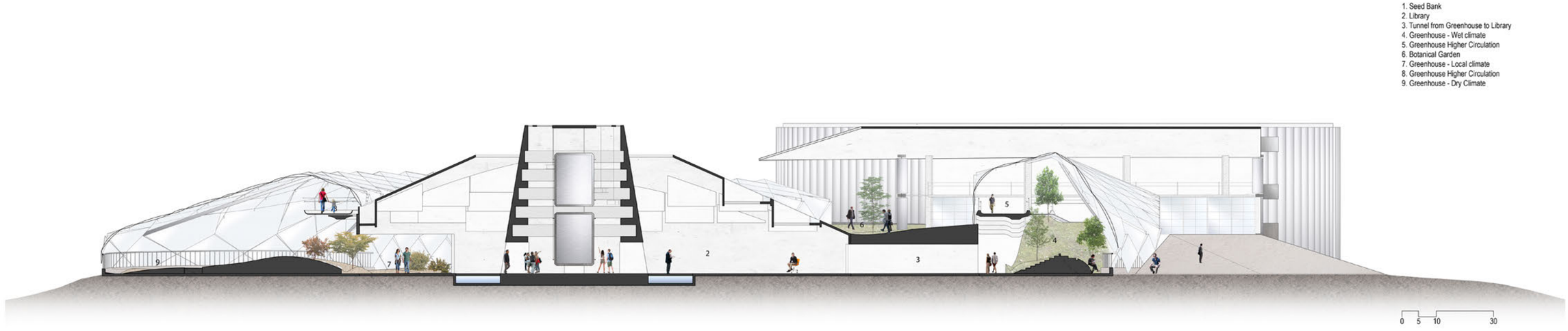


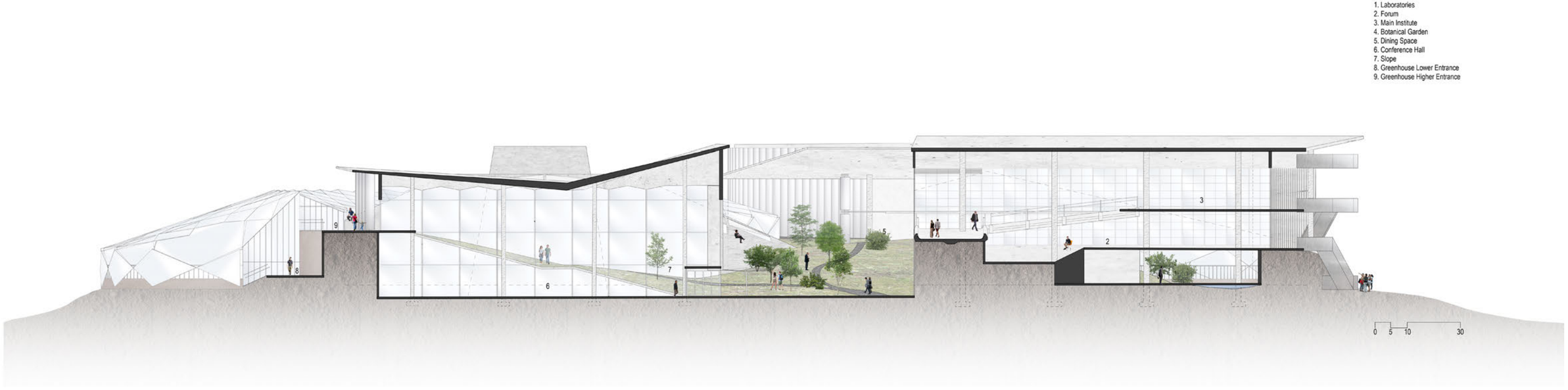

Roof Plan

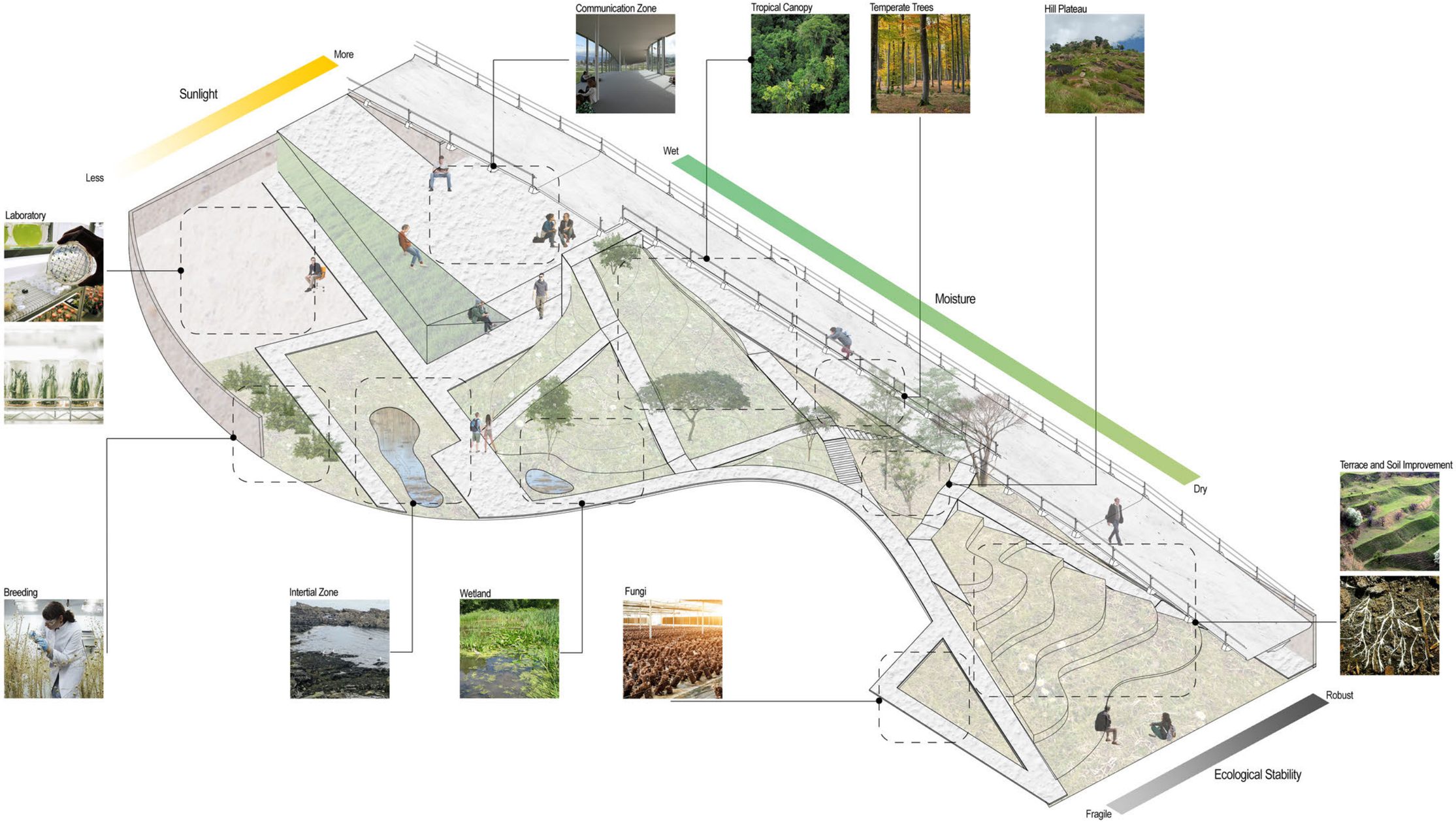


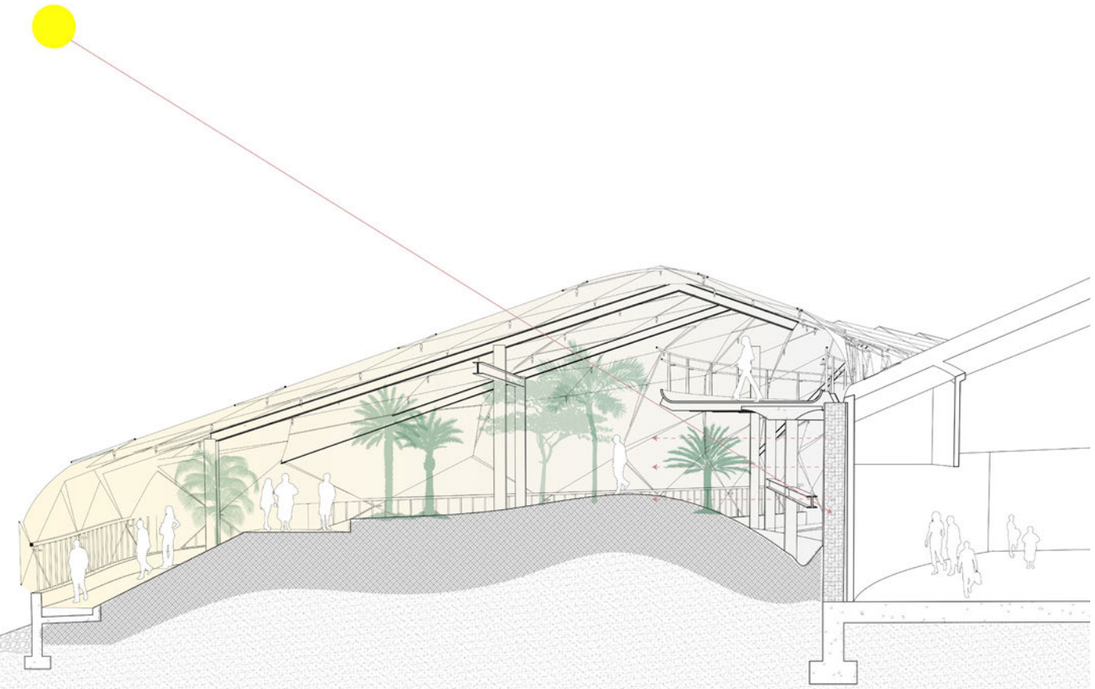



Floor 1 Plan

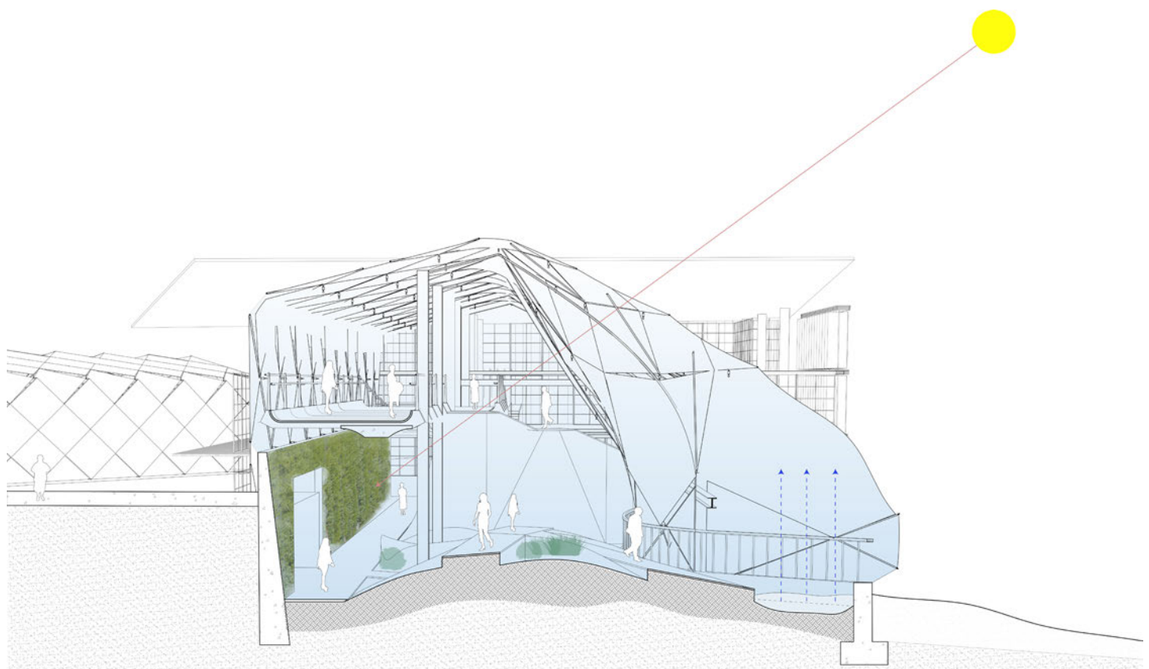

1. Seed Bank
2. Library
3. Tunnel from Greenhouse to Library
4. Greenhouse - Wet climate
5. Greenhouse Higher Circulation
6. Botanical Garden
7. Greenhouse - Local climate
8. Greenhouse Higher Circulation
9. Greenhouse - Dry Climate
0 5 10 30


1. Laboratories
2. Forum
3. Main Institute
4. Botanical Garden
5. Dining Space
6. Conference Hall
7. Slope
8. Greenhouse Lower Entrance
9. Greenhouse Higher Entrance
0 5 10 30


Communication Zone
Tropical Canopy
Temperate Trees
Hill Plateau
More
Sunlight
Less
Wet
Moisture
Dry
Laboratory
Terrace and Soil Improvement
Breeding
Intertial Zone
Wetland
Fungi
Robust
Ecological Stability
Fragile



DESERT - DRY BIOME



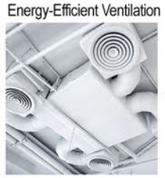
WETLAND - WET BIOME

Pertanian Hidoponik

Comminal Gardens

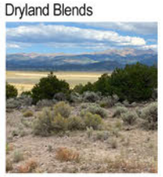
Drip Irrigation

Energy-Efficient Ventilation



Herbs

Dryland Blends

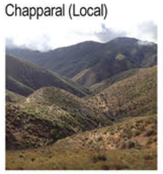


Sustainable Drainage

Rainwater Collection

Bioremediation

Chapparal (Local)



Large

Small

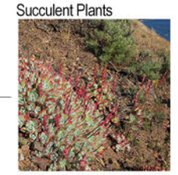
Water Consumption

Urban

Urban Relationship

Wild

Succulent Plants



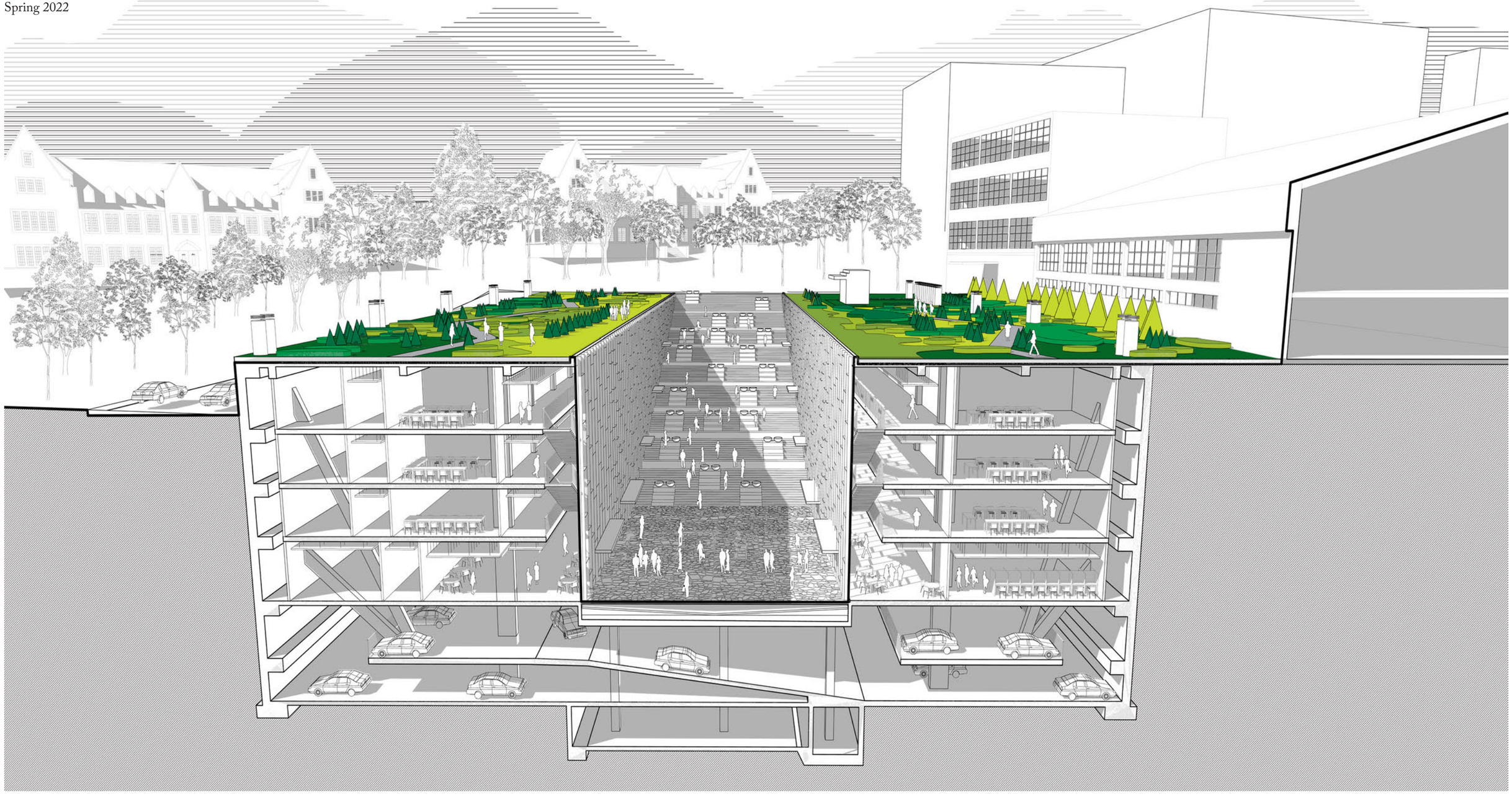
Desert Slope

Water Containers

# 05
# Section Study

Section of Ewha Women's University

GSAPP Visual Studies Elective
Instructor: Marc Tsurmaki
Spring 2022



# 06
# Housing Ecology

The Paradox of Hong Kong

GSAPP Transscalarities
Instructor: Andres Jaque, Pedro Correra Fernandez
Summer 2021

Economic and political forces have made Hong Kong a major economic hub in Asia but it comes at a price. Currently Hong Kong faces a housing crisis. With a population of 7.7 million on limited amount of land, some citizens are priced out of the housing market and forced to live in “caged homes”, shared apartments with barely enough space for one bunk bed per resident. The Hong Kong government’s solution to land scarcity? Build more land. This solution will damage the marine life and critics have suggested alternatives. As cities move towards a more sustainable future, urban planners, policy makers, and architects must understand that housing and density is an environmental issue.

Hong Kong is a city of contradictions. It is a crowded city yet 75% of the land is undeveloped natural mountain landscape. The city is attractive to business people for the economic freedom afforded by low-income taxes yet it is the most expensive city in the world to purchase property. Homeownership has become an impossible dream for many citizens. In 2018, Chief Executive Carrie Lam introduced the Lantau Tomorrow Vision, 4 artificial islands expected to provide 400,000 homes with 75% as affordable housing. The new islands are strategically located near the airport and other infrastructure to create a business gateway to other Chinese cities. Critics have suggested brownfield sites and private golf courses as alternatives to land reclamation.



Land reclamation has detrimental effects on both the local and global scale. Land reclamation requires the removal of sand or mountain from a region often less developed. The Marina Bay Sands hotel in Singapore is an example of the detrimental effects that land reclamation can have at the global scale. The Marina Bay Sands sits on sandfill excavated from mangrove forests in Cambodia, damaging an ecosystem that local people relied on. The sand was excavated and transported to serve the luxury economy of the hotel industry at the expense of the people of Cambodia. The Marinda Bay Sands serves as a precedent for the complex web of relationships between people, marine life, and the economy.

Similarly in Lantau, churned sediment and the deposition of organic and inorganic polluting materials will have a causal effect on marine food webs. More turbulent waters can decrease sunlight and affect marine photosynthesis. Polluting substances can be consumed by smaller fish and increase the food web’s toxicity. Currently the proposal for Lantau Tomorrow Vision is a shortsighted vision that has not considered where the sandfill would be excavated from. What is the alternative? Is this damage to marine life necessary to prevent people living in “caged homes”? Do we have to choose between the people of Hong Kong, the local marine life, golfing, or the forests in Cambodia?
The decision on how to move forward on the Lantau Tomorrow Vision will set a precedent for cities across the world on how to think about urbanistic issues while remaining sustainable. Urban planners, policy makers and architects must navigate the interest of the market as well as the long-term interests of the planet.

# Farm-to-Table





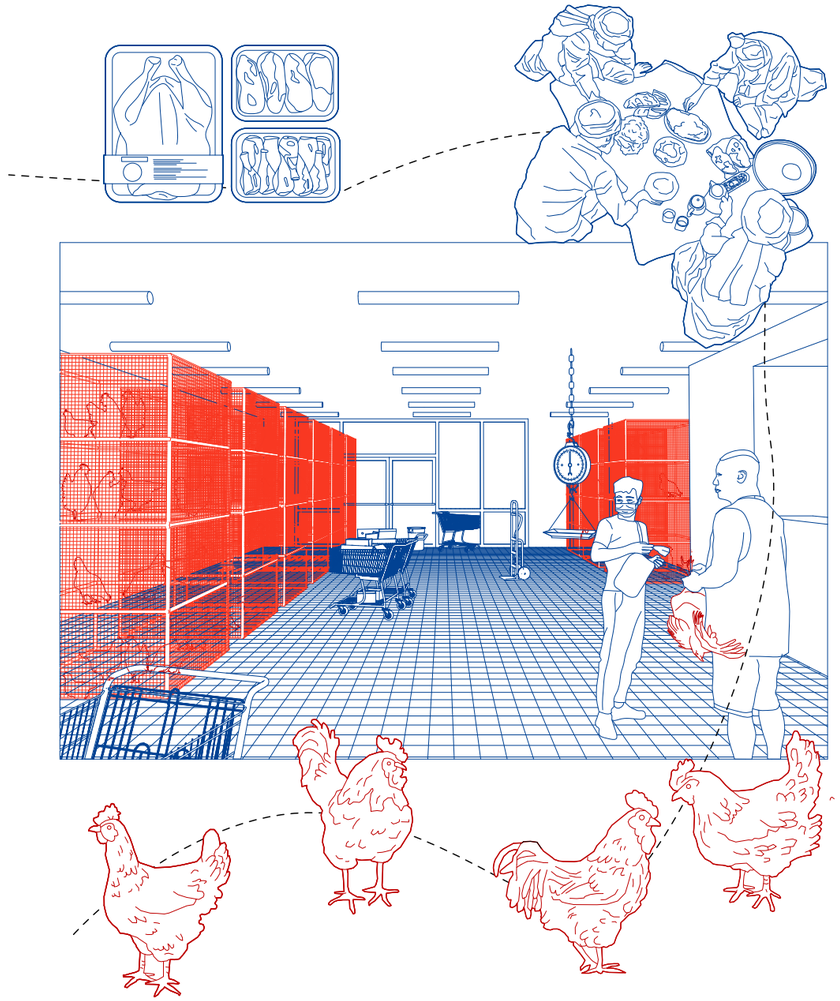
**How can we calculate energy needed for your food and measure the impact of sociability and lifestyle? Urban Chicks rethinks consumption by observing the immigrant version of farm-to-table. What is the impact of consumption in your lifestyle and how does your house, market, and community shape them?**

07

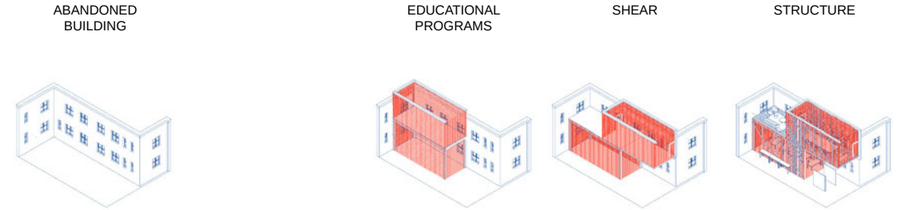
# URBAN CHICKS

## Learning from Immigrant Version of Farm to Table

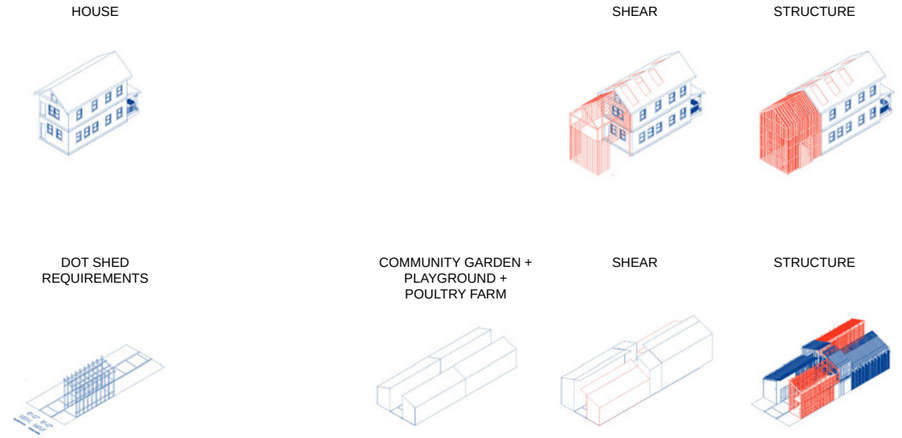
LOCATION Flushing, New York
TYPE Micro-Scale
SIZE Various
INSTRUCTOR Phu Hoang
in collaboration with Zenah Sakaamini and Joyce Zhou
Fall 2021





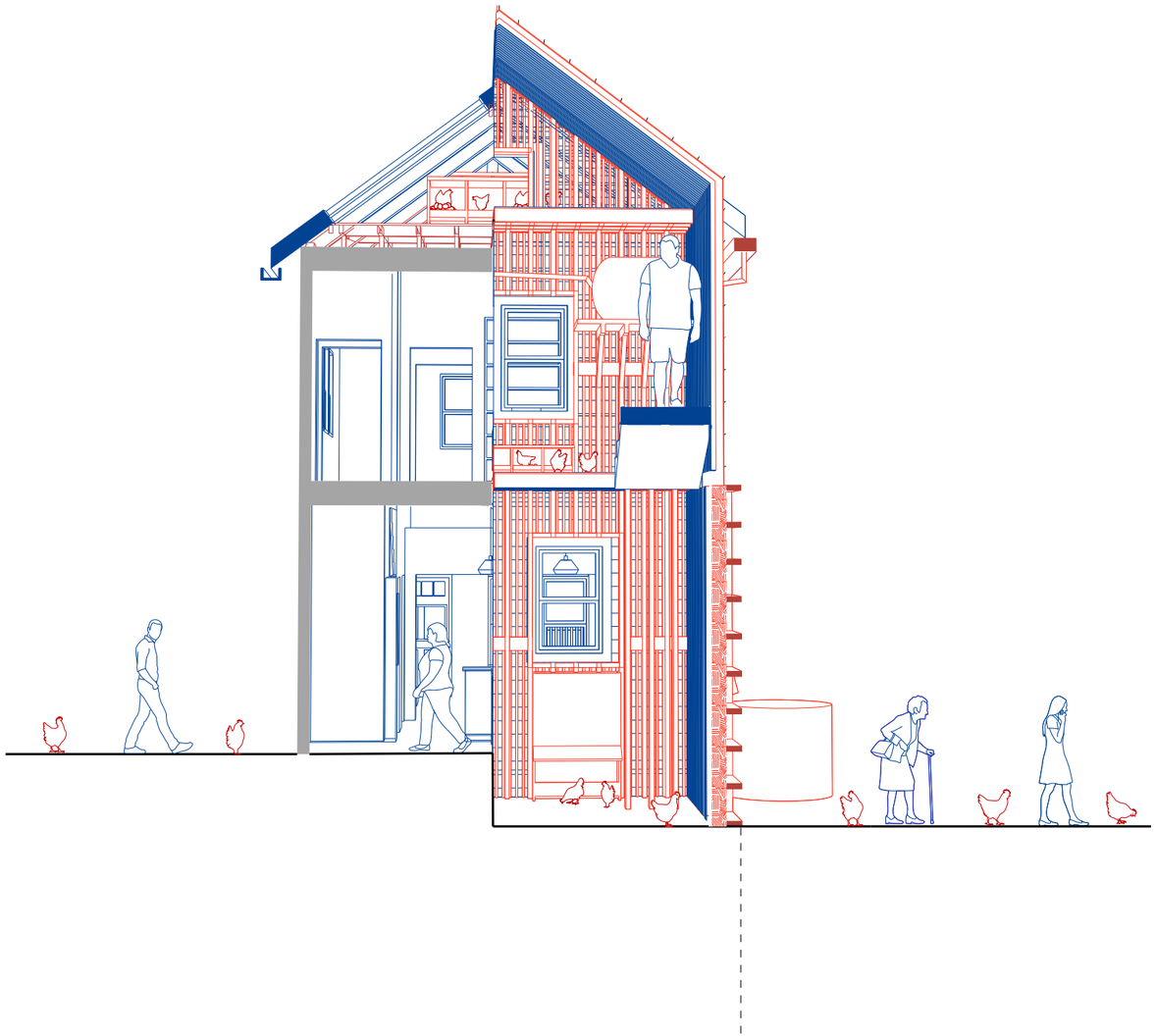




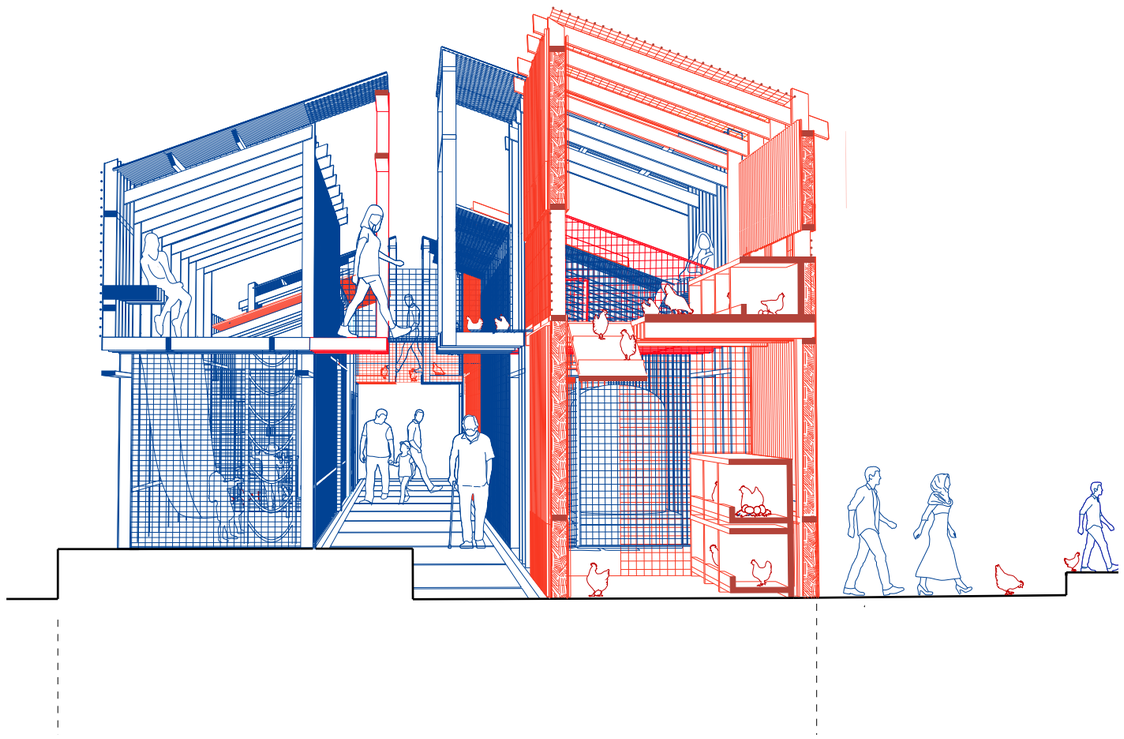


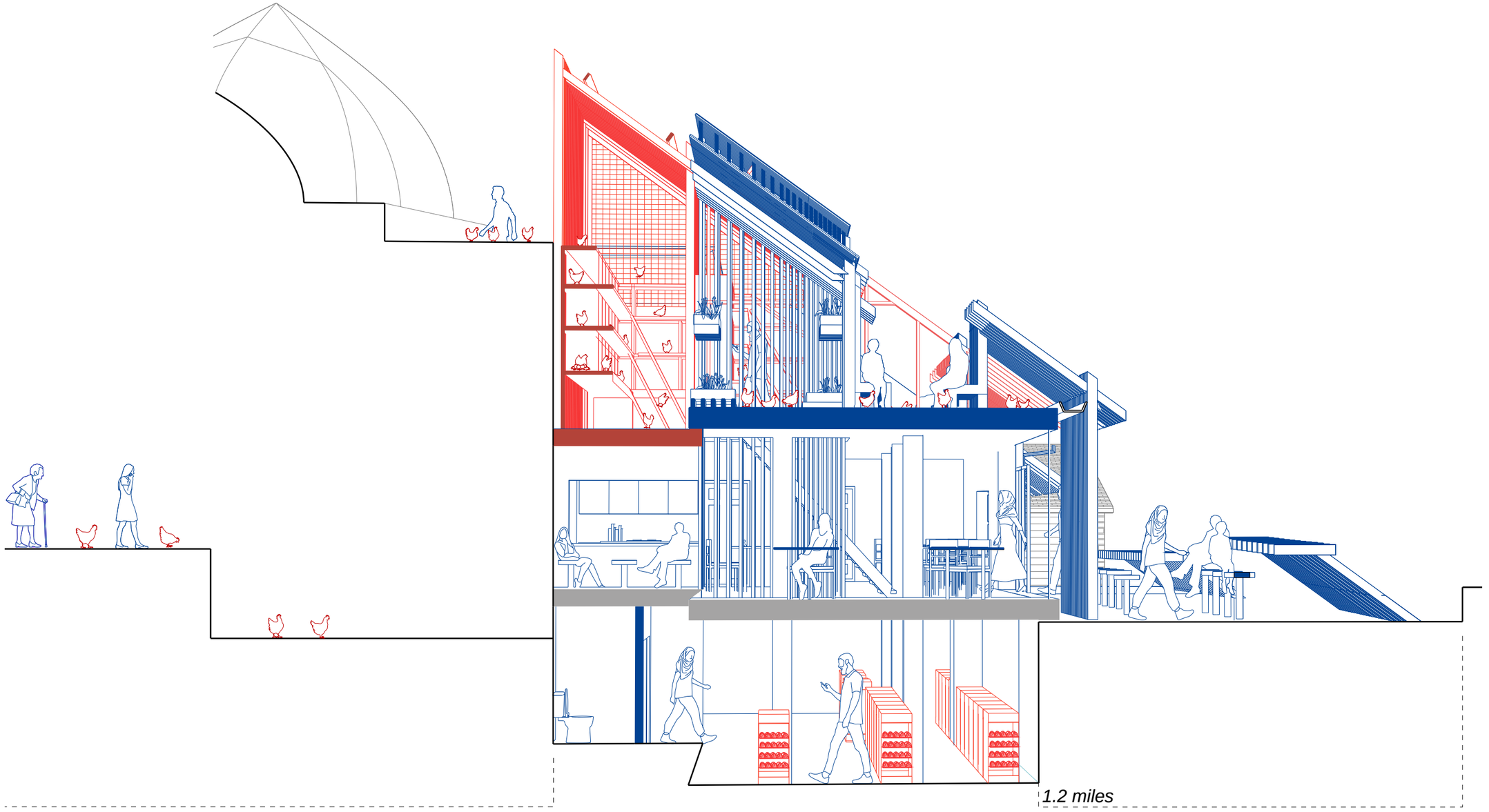

**Our proposal examines opportunities for re-introducing farms to an urban setting by producing a localized and sustainable farming solution. First, an early analysis of immigrant communities such as Afghan Muslims and Asian communities examines the relationship between non-western food consumption and environmental implications. We then identify typologies unique to Flushing Queens, finding spatial opportunities to mediate coexistence between humans and chickens allowing for a deeper understanding of an immigrant-based farm to table process.**

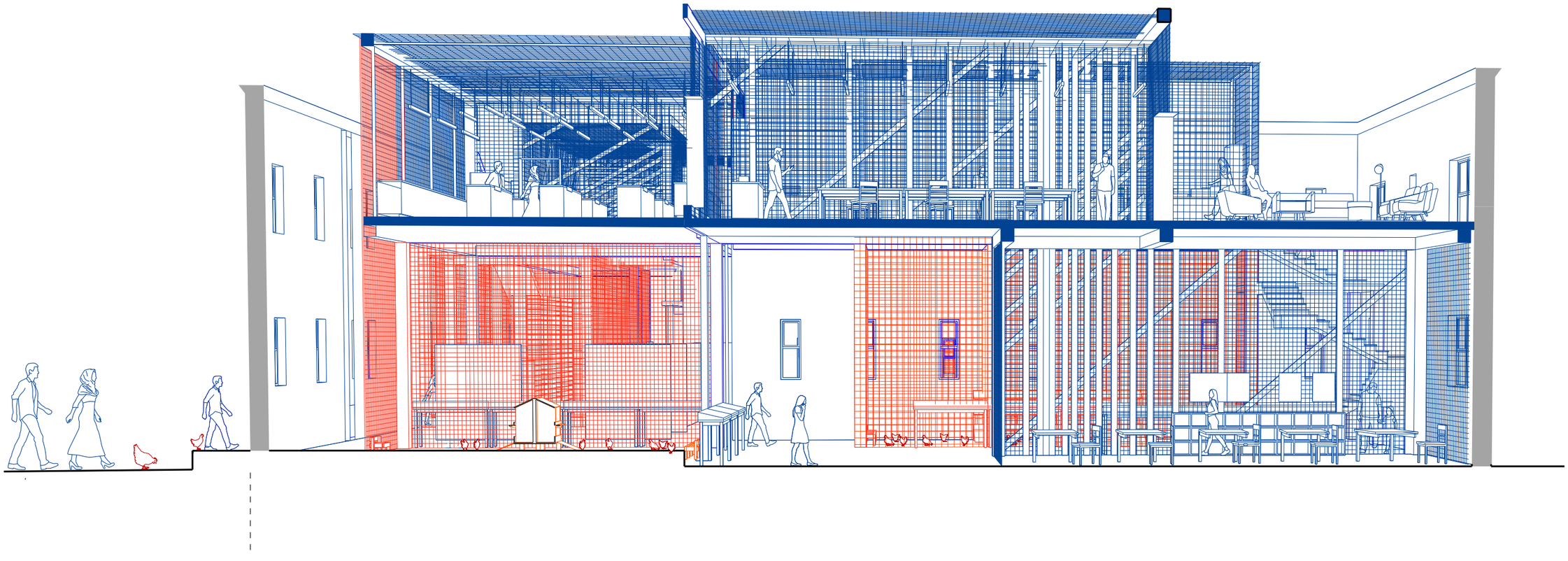
**"Non-building" architecture is explored through mesh and timber construction, emphasizing the ease and flexibility of co-existence. A typical house explores cohabitation between humans and chicken. In contrast, a community garden interweaves public human activities with chicken coops. The abandoned building then includes exhibitions and a butcher adhering to non-western poultry practices catering to Halal, Kosher, and non-faith-based meat processing. Finally, the House-Mosque serves as the table end restaurant and herb garden engaging visitors and chickens.**

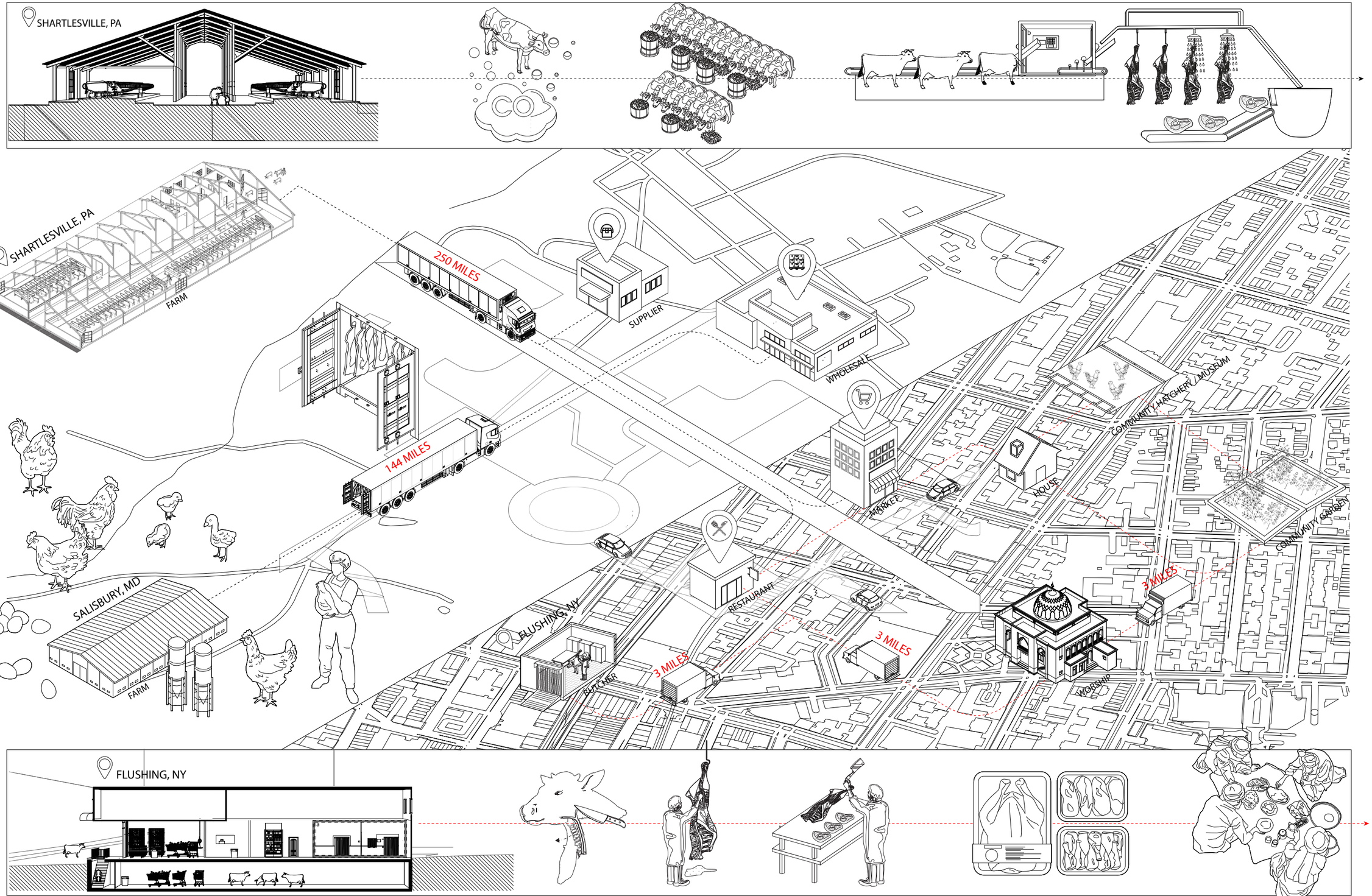







1.2 miles




SHARTLESVILLE, PA
CO
SHARTLESVILLE, PA
FARM
250 MILES
SUPPLIER
WHOLESALE
COMMUNITY HATCHERY / MUSEUM
144 MILES
HOUSE
MARKET
COMMUNITY GARDEN
SALISBURY, MD
FARM
FLUSHING, NY
RESTAURANT
3 MILES
3 MILES
3 MILES
BUTCHER
WORSHIP
FLUSHING, NY

# Real Estate Development



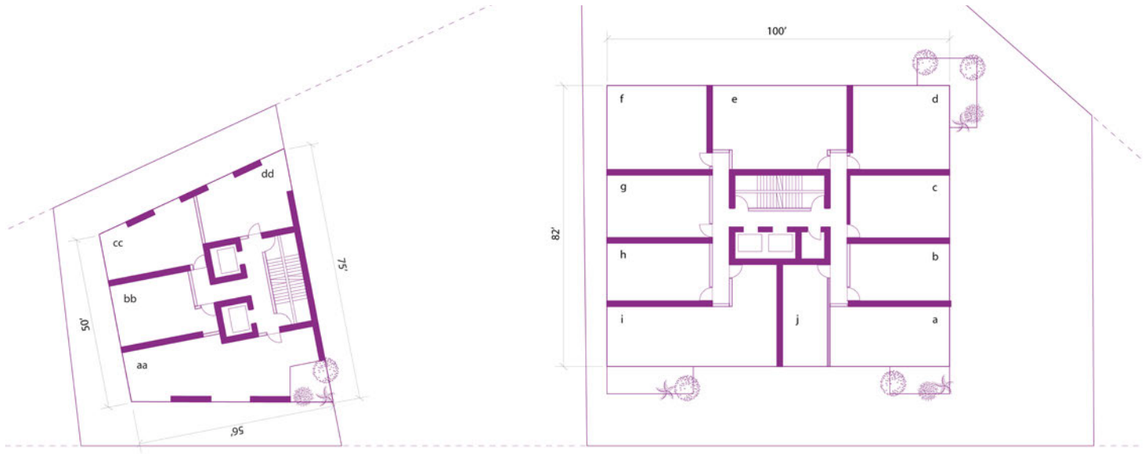


**To transform the future of cities architecture should recognize the private sector as our clients. An understanding of zoning and regulations can lead to design opportunities. How can architects challenge existing zoning regulations? What does the interests of a real estate developer have on the environment? How can regulations encourage free market competition to generate innovation and opportunity for a sustainable future?**

# 08
# DESIGN BY DEVELOPMENT

## Zoning Study in Downtown Brooklyn

GSAPP MSRed Elective
Instructor: Eran Chen
Partners: Radha Devang Kamdar, Kourosh Fathi
Fall 2021


building 1 (efficiency 78%)

aa - 1000 sf (2 bed + 2 bath)
56'W 18'D

bb - 480 sf (studio)
18'W 29'D

cc - 500 sf (alcove studio)
29'W 20'D

dd - 510 sf (alcove studio)
26'W 20'D

building 2 (efficiency 87%)

a - 620 sf (1 bed + 1 bath, small)
35'W 17'D

b - 680 sf (1 bed + 1 bath)
17'W 29'D

c - 680 sf (1 bed + 1 bath)
18'W 29'D

d - 740 sf (1 bed + 1 bath + den)
28'W 25'D

e - 930 sf (2 bed + 2 bath)
40'W 25'D

f - 740 sf (1 bed + 1 bath + den)
29'W 25'D

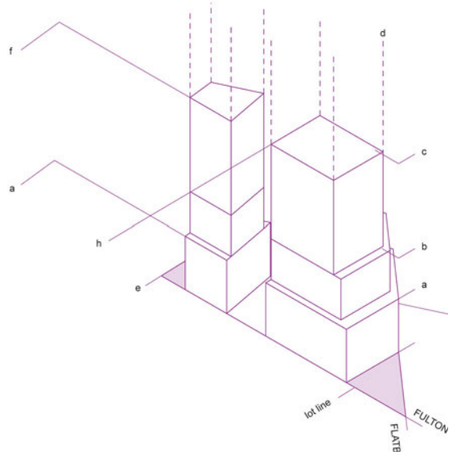
g - 680 sf (1 bed + 1 bath)
18'W 30'D

h - 680 sf (1 bed + 1 bath)
17'W 30'D

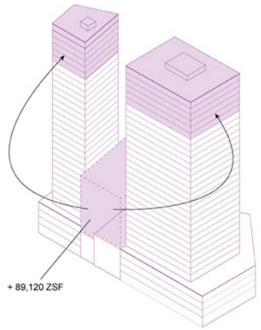
i - 1000 sf (2 bed + 2 bath)
50'W 30'D



## Zoning Analysis




### Air Rights (524,600 SF)




a - base heigh for residential uses in limited to 85' beyond which a set back of 15' is required from wide streets and a set back of 10' is required from narrow streets.

b - the tower can occupy 65% of the zoning lot up 300' in height

c - for lots above 15,000sf, the tower can occupy 40% of zoning lot area

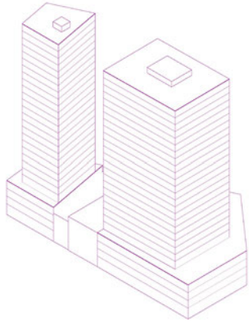
d - no height restriction

e - through lots have yard requirements

f - for lots above 15,000sf, the tower can occupy 50% of zoning lot area

total FAR = 10, residential FAR = 12

### As of Right (435,480 SF)



### Plaza