

**ARCH 2281: DESIGN FUNDAMENTALS 1**

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SPRING 2023

SCHOOL OF ARCHITECTURE

COLLEGE OF DESIGN

UNIVERSITY OF MINNESOTA

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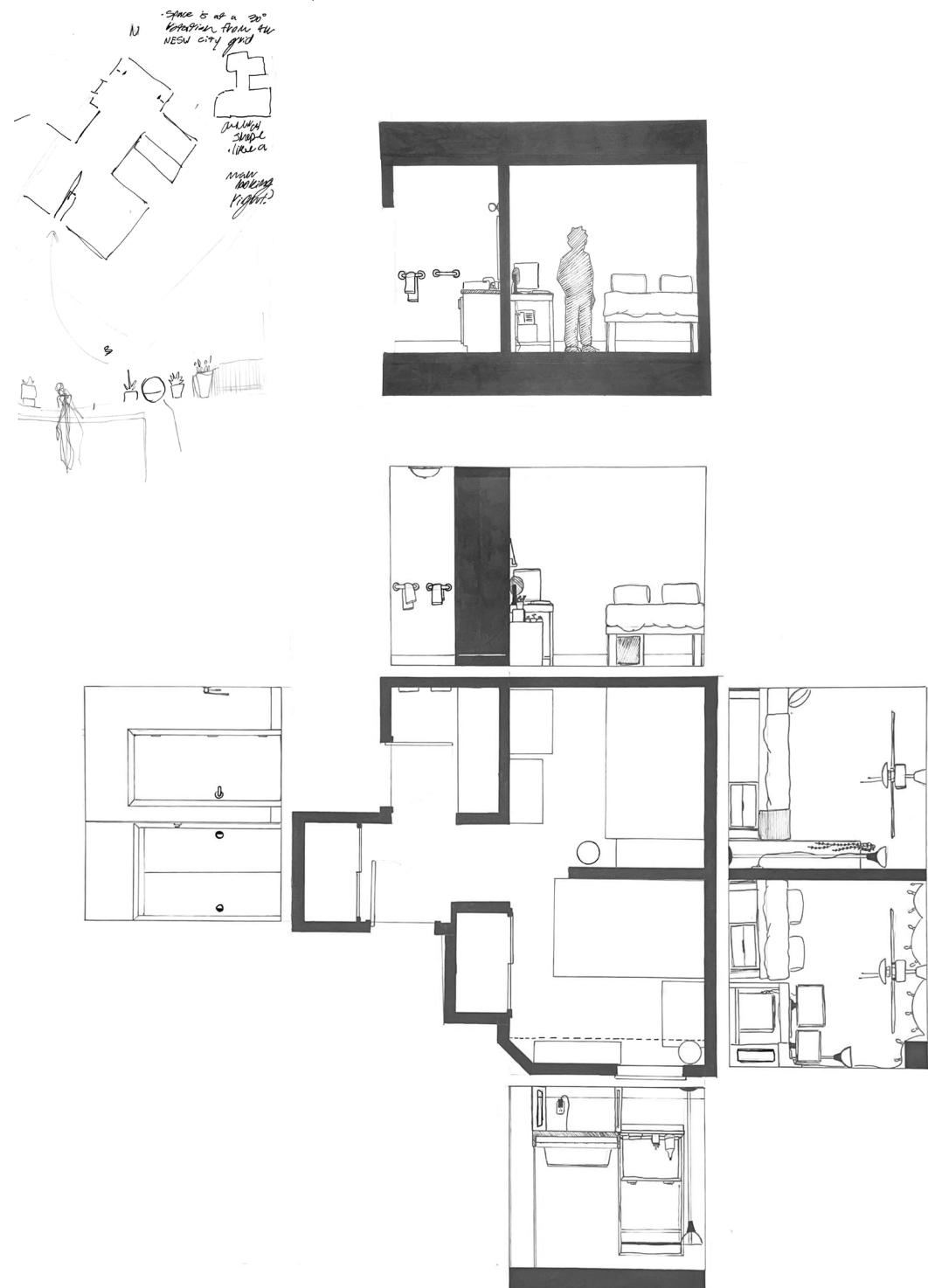
## **ASSIGNMENT 1**

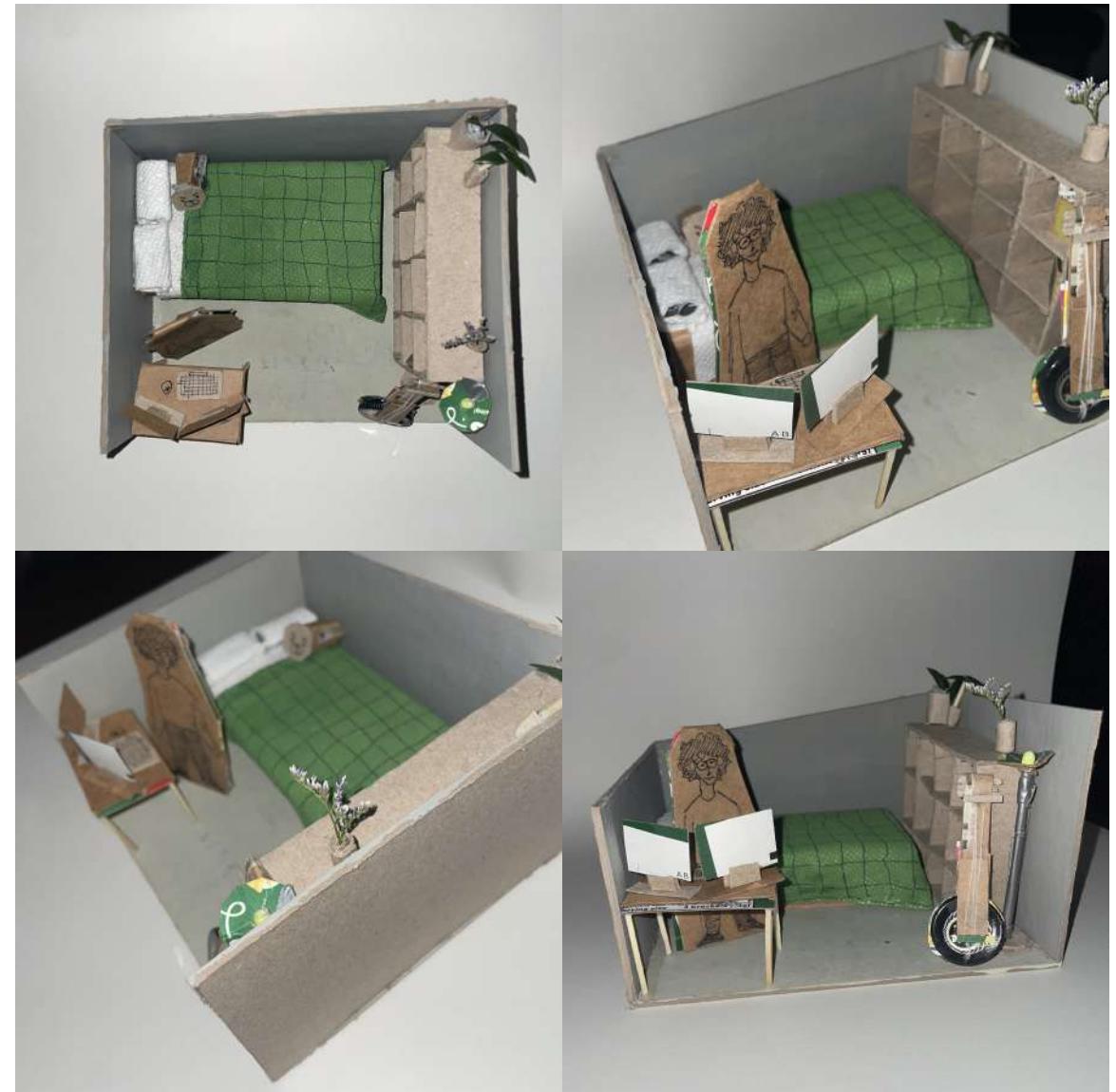
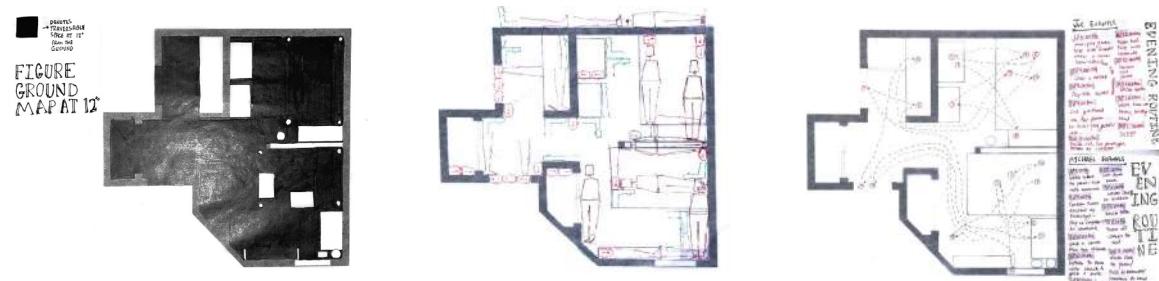
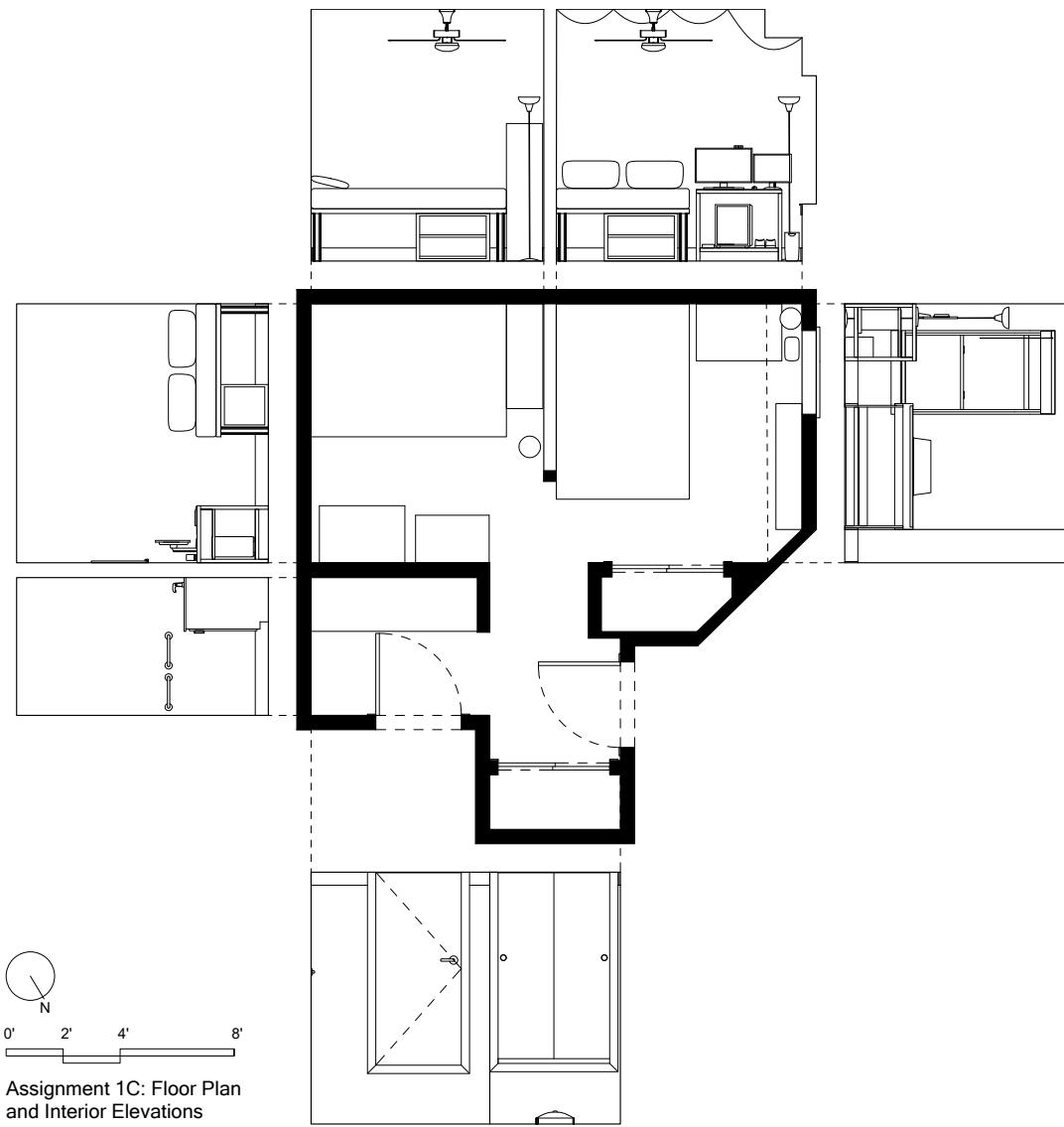
Assignment one set out to initiate us to the analysis of potential and constraints contained within a site we personally selected — for the majority of students including myself a dorm or apartment — and to develop text, photography, sketches and graphics that serve to represent the qualities of the chosen space.

The assignment initiated with each student generating an essay that served to give a detailed description of the room, a panoramic photograph of the space and sketches detailing quantifiable qualities such as the placement and dimensions of furniture or walls. We then proceeded to create a hand drawn 1/2" plan including projected elevations, an additional 1/2" plan including projected elevations made in Rhino 7, multiple maps of the space in relation to the human body and activity and graphics and models attempting to capture the atmosphere of the space.

This assignment immediately advanced my perception of space, as I quickly realized my initial perceived plan of my space was drastically different from the measured plans and sketches I had generated.

The assignment also succeeded in assisting me to develop my sketching capabilities in both physical and digital media, with the cleanliness and clarity of my work increasing over the course of completing the work of assignment one.





joe sanders, digital plan and elevation and ground maps, 2023

joe sanders, atmosphere model, 2023

## ASSIGNMENT 2

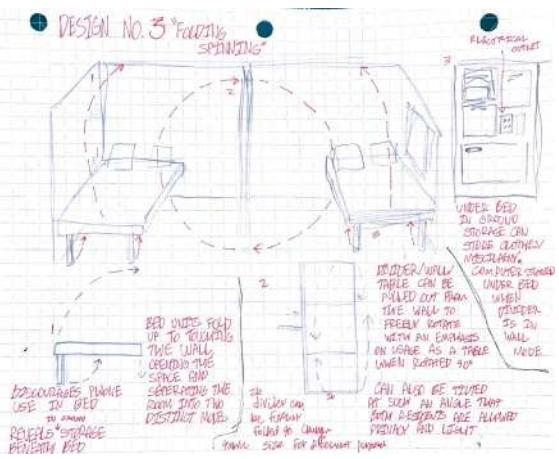
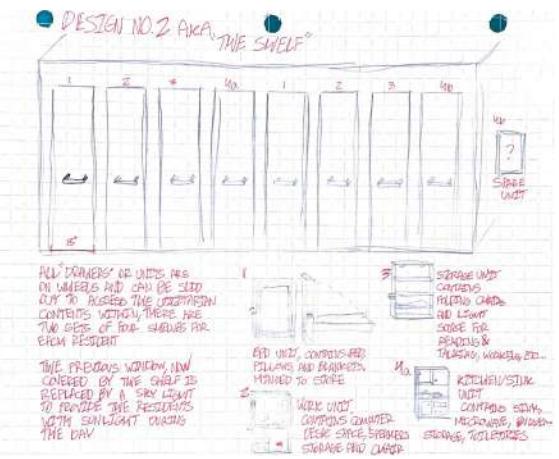
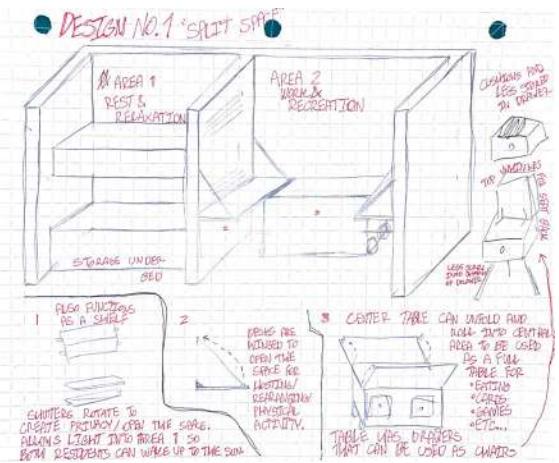
Assignment two was an exercise in design attempting to investigate, interrogate and explore our selected built environments.

The assignment was divided into two parts, an initial exploration of our room produced a 1/2" physical model and the opportunity to define the problems and opportunities provided by the space. The second part of the assignment attempted to address the issues proposed at the end of the first through the creation of three design options that address the issues developed. The three design options proposed were represented with 1/2" physical models, plans developed in Rhino 7 and a graphic.

Serving as my first foray into explorative design in design fundamentals II, assignment two broadened the scope of possible work from the first assignment and allowed me to experiment with the three design iterations.

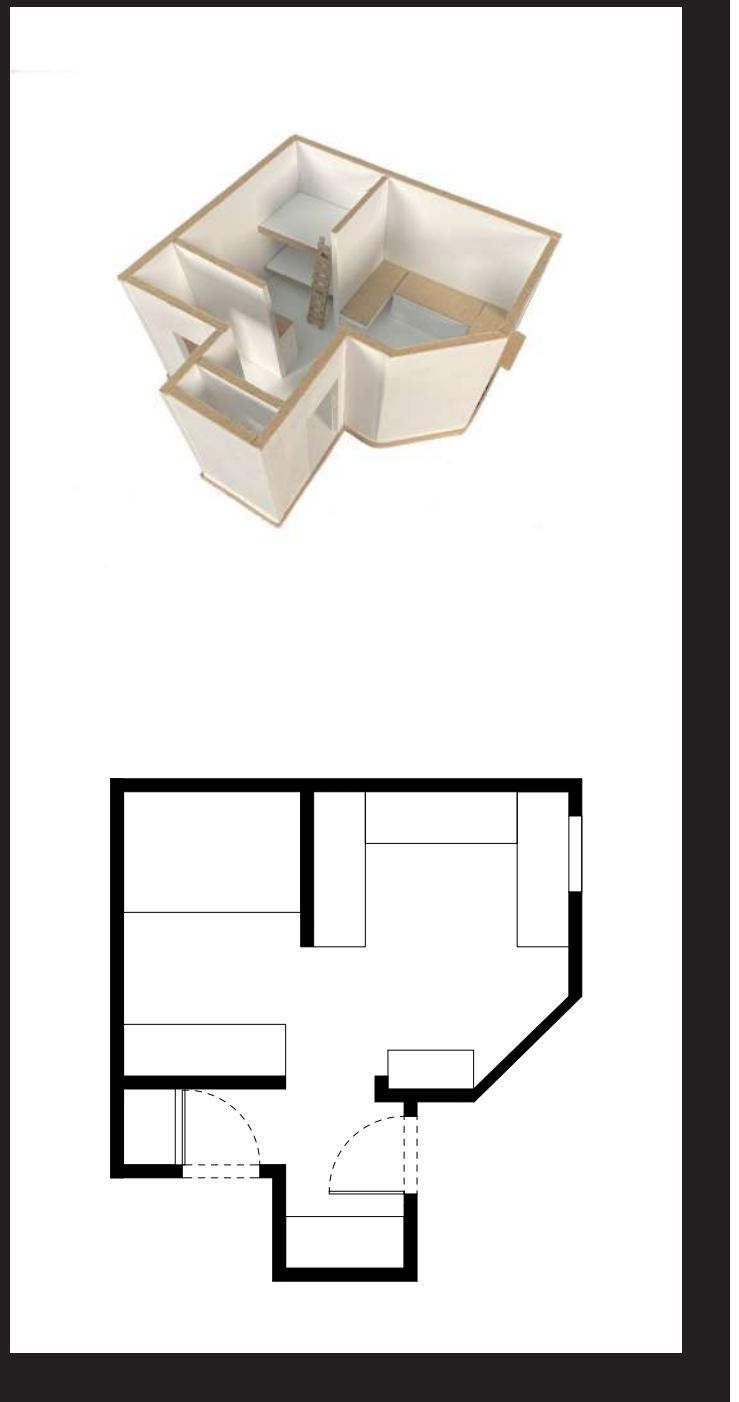
The models produced in the second half of assignment two already shows improvement from the first in rigor and clarity, I believe my modeling "style" also began to form during assignment two, and served as an important stepping stone from my initial experience towards the model produced in assignment four.

## ASSIGNMENT 2 AN APPARATUS FOR...

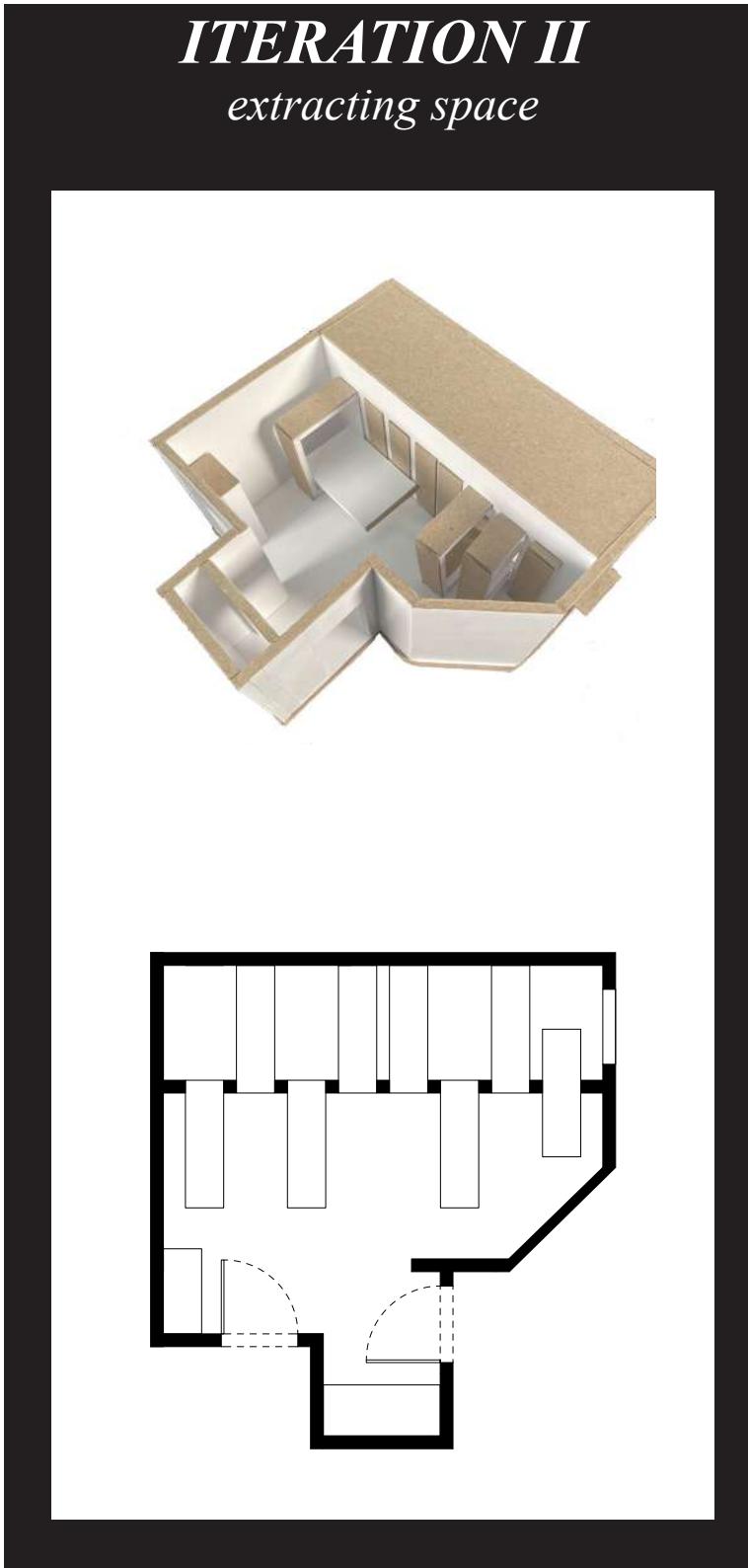


joe sanders, existing space model and design option initial sketch, 2023

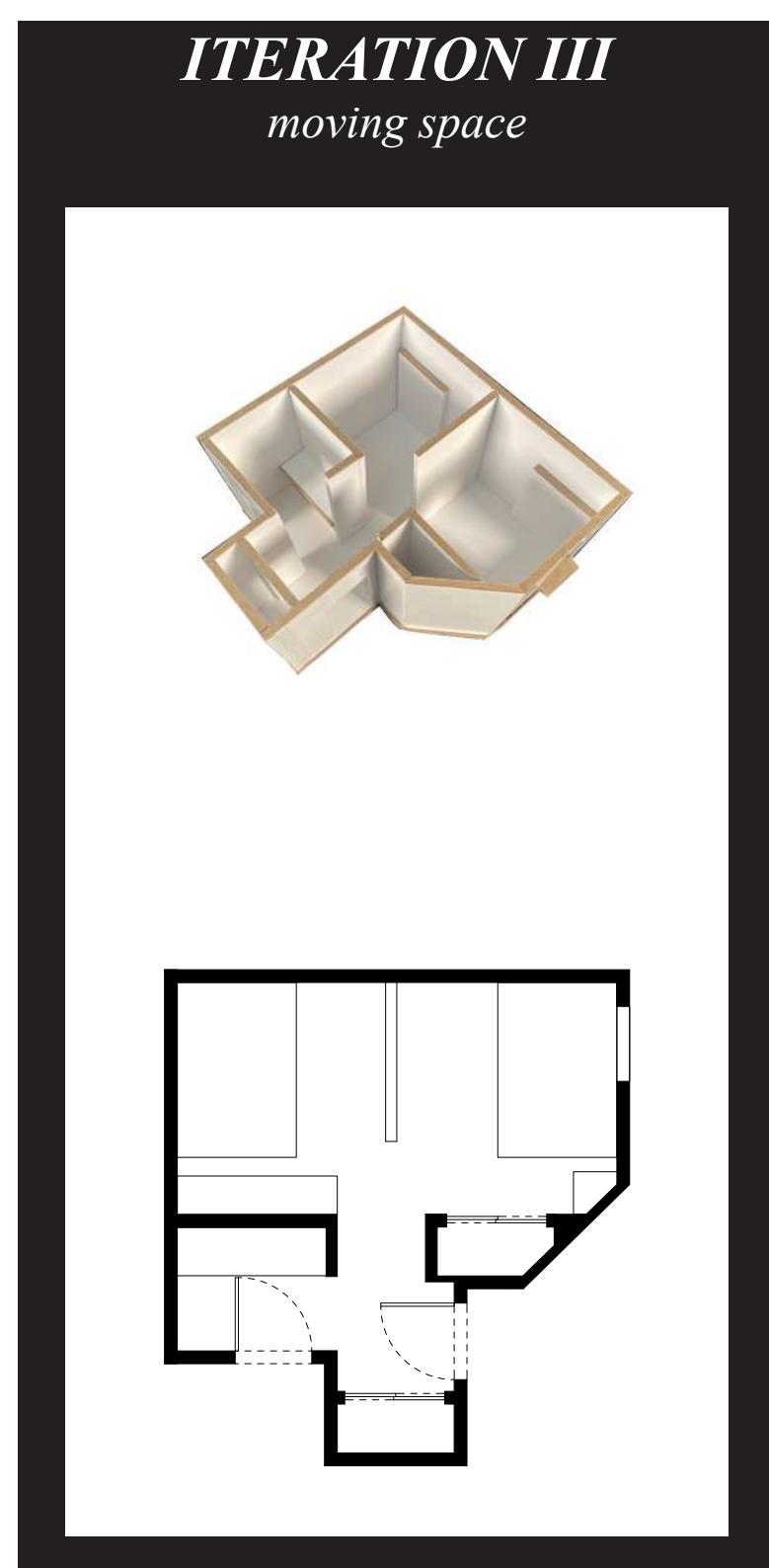
*ITERATION I*  
*dividing space*



*ITERATION II*  
*extracting space*



*ITERATION III*  
*moving space*



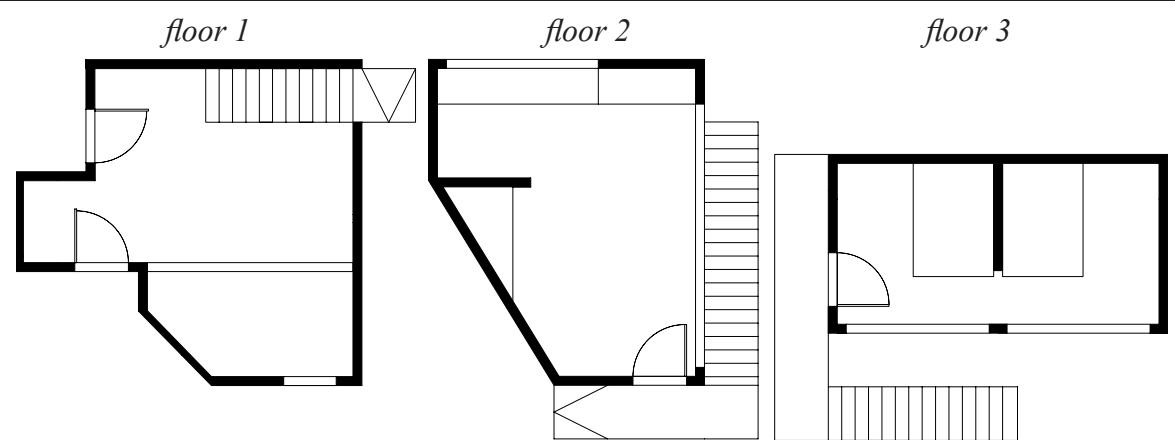
### **ASSIGNMENT 3**

Assignment three was an exercise in the observation and investigation of existing work designed by architects considered exceptionally prolific or inspirational.

The assignment consisted of an initial analysis of the assigned precedent examining the who, what, when, where and how of the structure. This research was then used to initiate the development of a one page precedent study and design option (similar to those produced in assignment 2) inspired by the precedent.

Go Hasegawa's *Pilotis in a Forest* served as my precedent study for this assignment, and was extremely valuable in helping me to unravel the potential of my existing space — primarily through pushing me to acknowledge my spaces location at the top of my building, and the utilization of scaffolding-like elements that would be expanded on in assignment 4.

While this design option isn't my favorite, I believe it stands as an important stepping point between my initial designs and the final design presented in assignment 4, specifically in terms of materiality, verticality, and the use of natural elements.



joe sanders, precedent space models and plans, 2023

### **ASSIGNMENT 3**

#### **PRECEDENT STUDY**

# PILOTIS IN A FOREST // GO HASEGAWA // GO HASEGAWA & ASSOCIATES



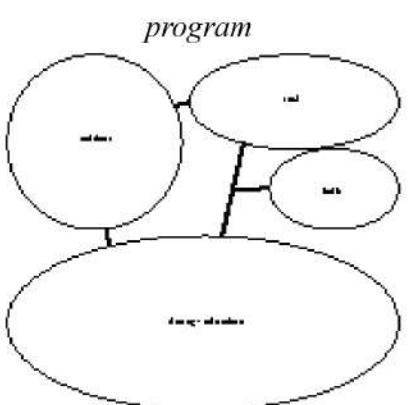
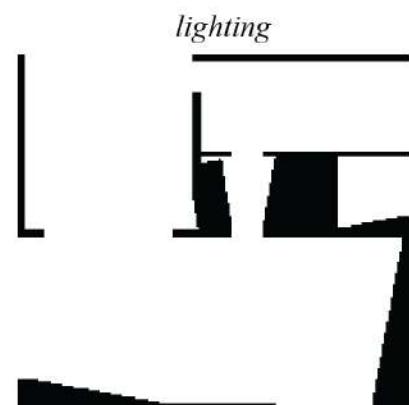
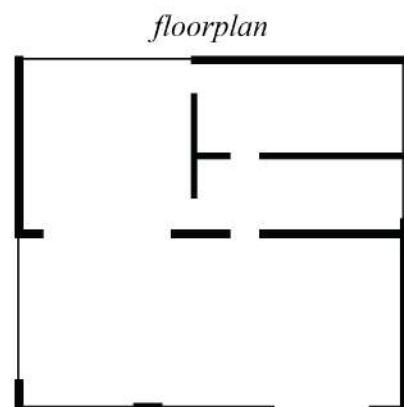
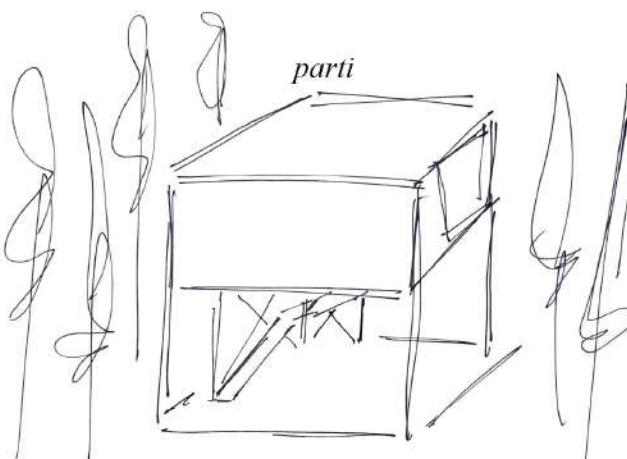
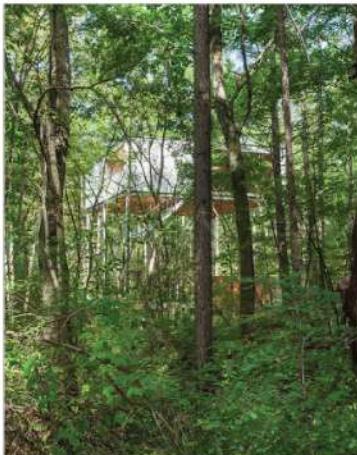
## GO HASEGAWA

Go Hasegawa is a Japanese architect currently based in Tokyo. Hasegawa was born in Saitama, Japan in 1977 and graduated with a Master of Engineering from the Tokyo Institute of Technology in 2002. Hasegawa worked at Taira Nishizawa architects for three years before establishing Go Hasegawa & Associates in 2005. Since this time he has received a number of awards - including the Shinkenchiku Prize in 2008 and the AR Design Vanguard in 2014.

## PROJECT INFORMATION

Pilotis in a Forest is a weekend house located roughly three hours from Tokyo in Gunma, Japan. The house was designed by Hasegawa & Associates through 2009 and 2010 with the project entering completion in 2010. The house was commissioned by a couple in their sixties looking to get away from their busy lives and surround themselves with the peace and tranquility of the forest. Standing six and half meters above the forest floor, the main structure of Pilotis in a Forest is held up through a series of light metallic stilts and cross braces. The raised dwelling is accessed by a set of structurally light stairs and features large frameless windows, a terrace, and louvered portions of the floor and ceiling that all work in tandem to blur the lines between indoor and outdoor space. Beneath this main dwelling is a paved area of the same proportions complete with hammock, table, benches and storage that allow this exposed area to behave as a living space to nearly the same extent as the enclosed box overhead. There seems to be a significant focus on lighting, site, and particularly materiality.

Exploring the materiality reveals a clear juxtaposition between the cold concrete and steel of the outdoors and the nearly homogenous wooden interior constructed mostly from plywood with lauan serving as a hardwood veneer. This sense of textural consistency present in the veneer helps the sights, sounds and smells of the forest to take focus while letting the interior and exterior blend together through material consistency amongst the trees and wooden paneling. The large windows and heightened profile of the structure give an express focus on view and perspective. The thin, nearly spindly steel beams supporting the structure in combination with the louvered construction lend the structure a quality of weightlessness. The simplicity present in the ideas presented in Pilotis in a Forest manage to at once allow nature to take focus while still having a distinct presence in amongst the trees.



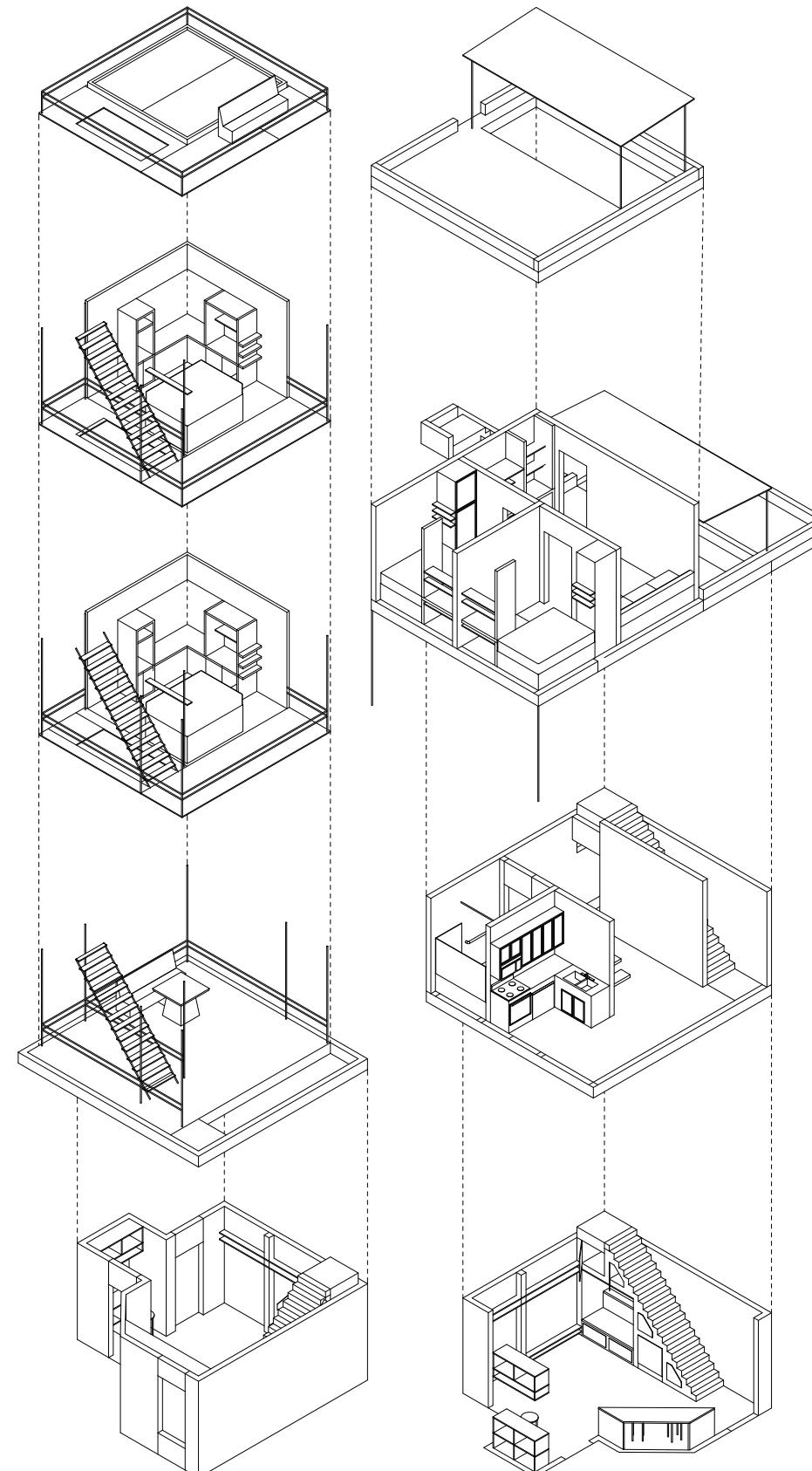
joe sanders, pilotis in a forest precedent study, 2023

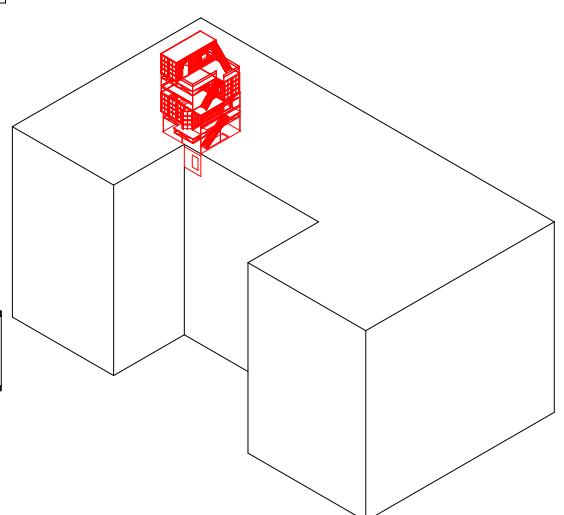
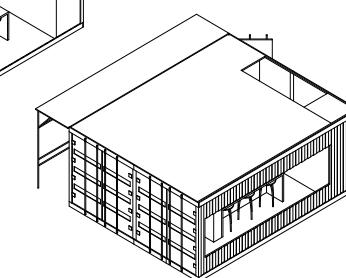
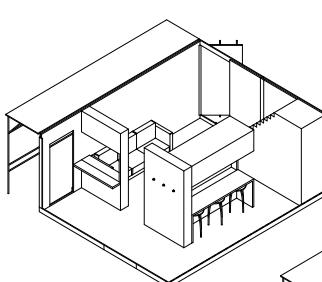
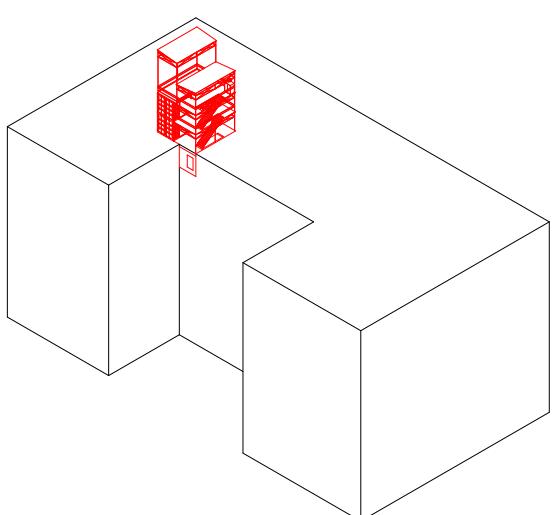
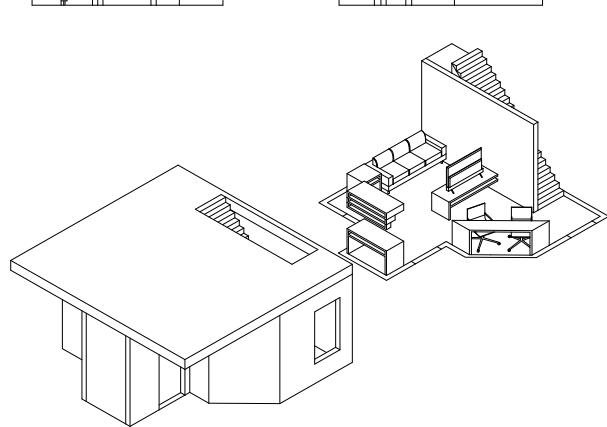
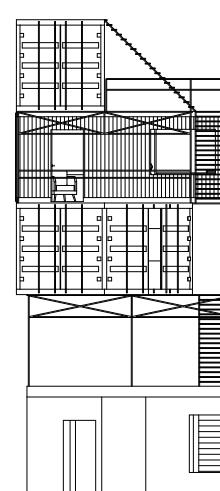
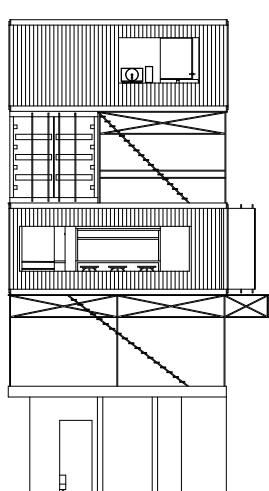
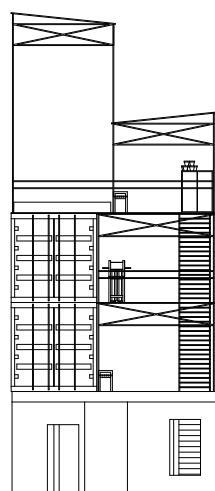
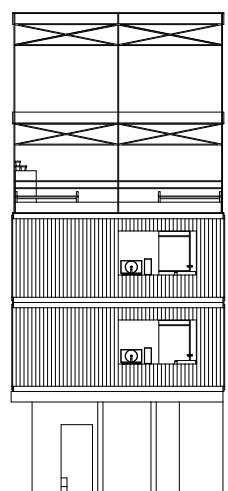
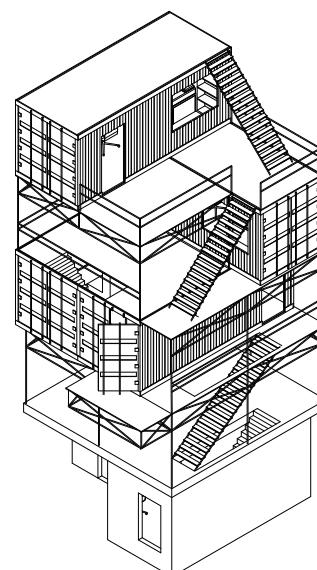
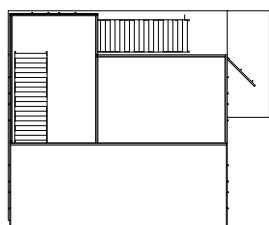
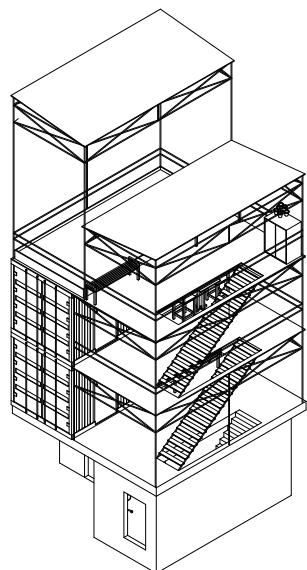
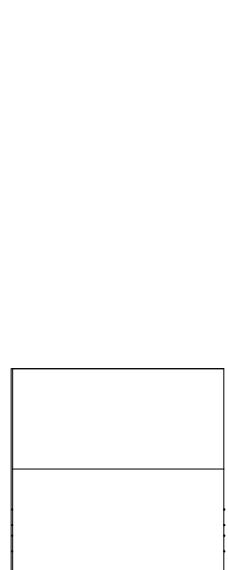
## **ASSIGNMENT 4**

Assignment four served as the culmination of all of the work done in Design Fundamentals II. The issues and opportunities developed in assignment two and the design options developed in assignments two and three were all used to develop a central idea around which several design iterations would be generated. This combination of issue and iteration would be summarized as an apparatus for growth.

The usage of growth is manifold, and was selected to attempt to address four primary points: the stifling nature of my existing space limiting feelings of personal growth, the lack of sunlight in my existing space limiting the ability to incorporate natural elements, the building of a second structure atop an existing building and at a larger level the limits rent based housing place on an individuals social and economic mobility. These concepts are all further fleshed out in both text and content in the final model and graphic developed for assignment four.

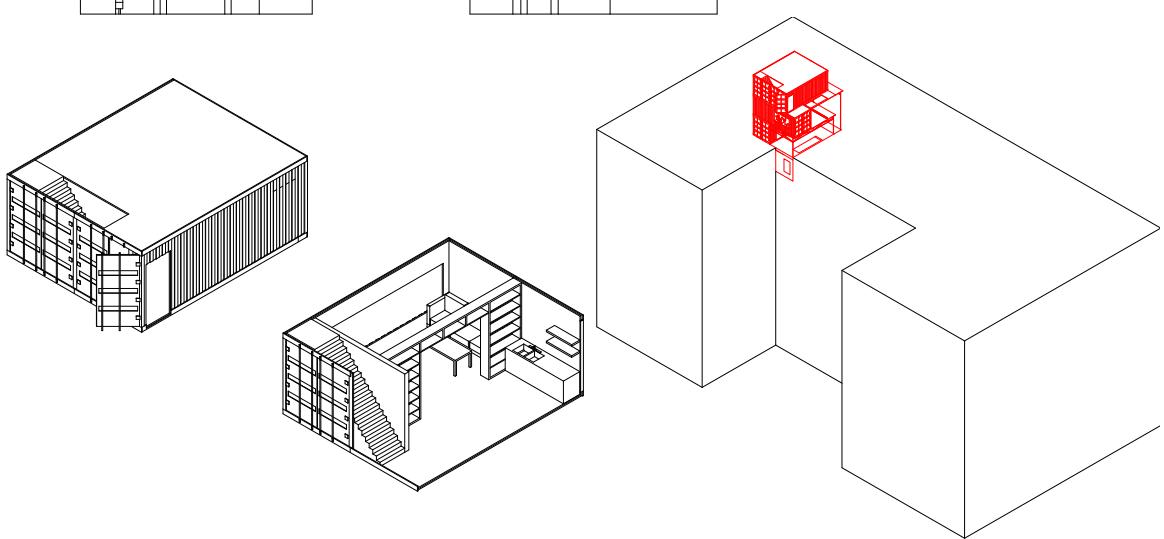
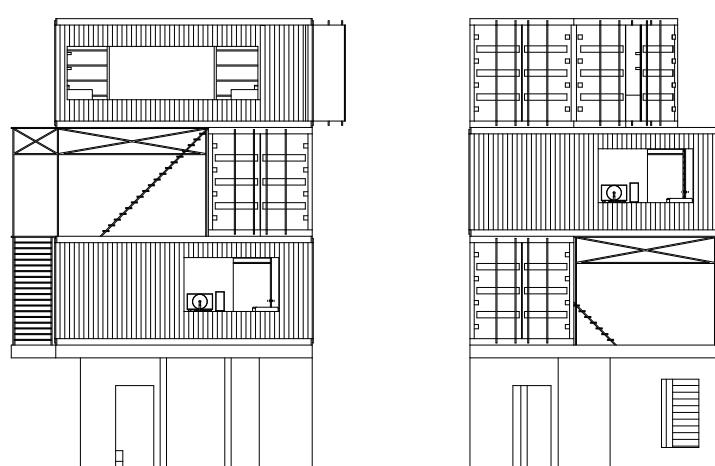
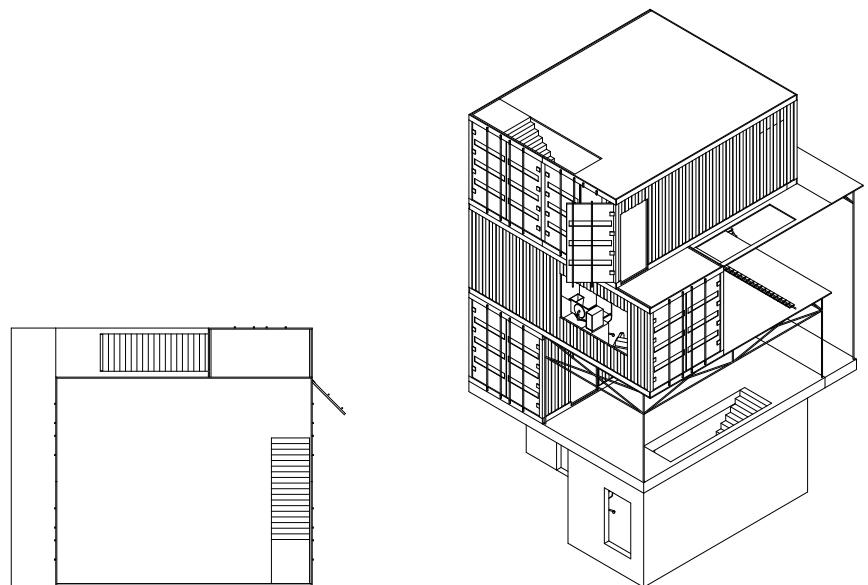
In intending to utilize the vertical space directly above my existing space I set out to create three limiting factors: keeping roughly withing the original floor plan of the space, keeping used materials cheap (aiming for a cost of under twenty thousand dollars not including construction), and ensuring construction is simple and expandable.





joe sanders, an apparatus for growth shipping crate prototypes, 2023

joe sanders, an apparatus for growth shipping crate prototypes, 2023



joe sanders, *an apparatus for growth shipping crate prototypes*, 2023

## ***ASSIGNMENT 4***

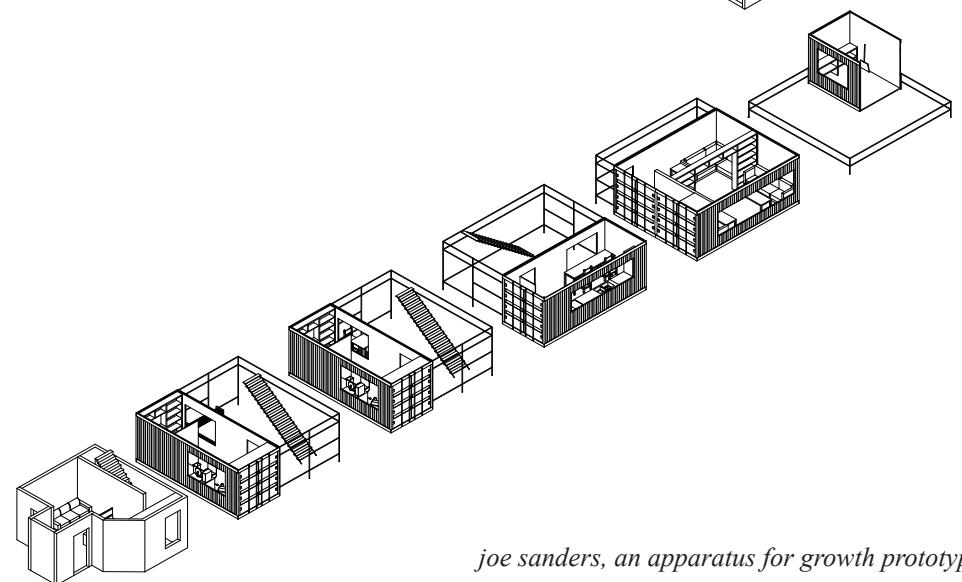
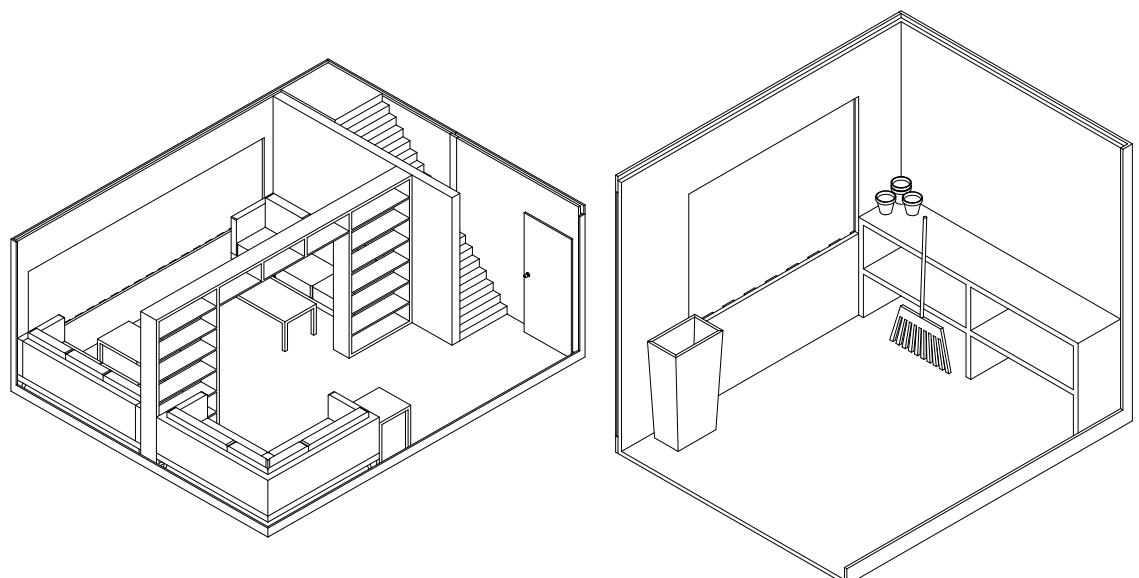
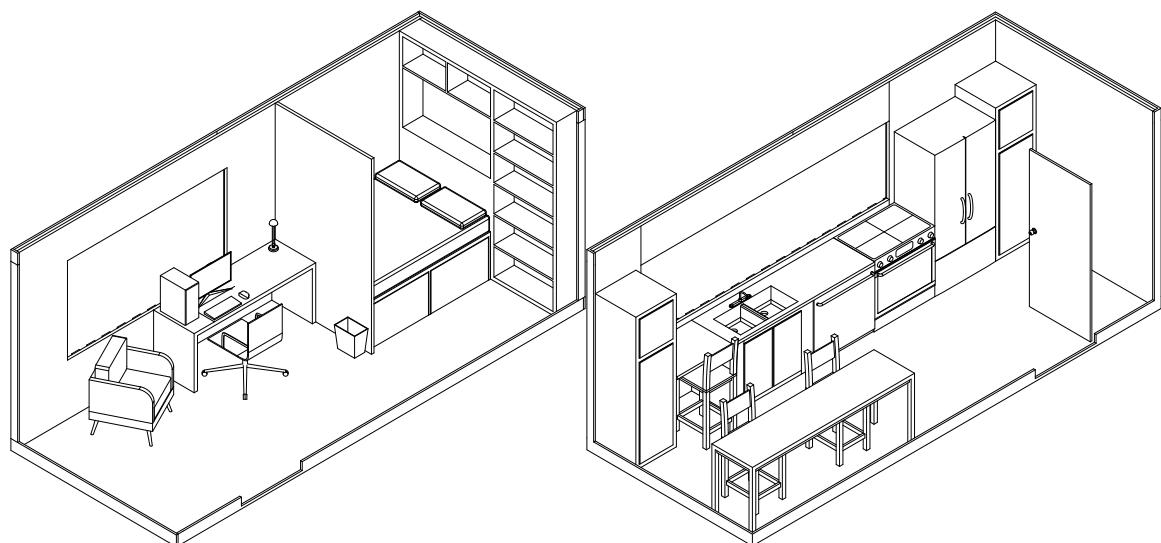
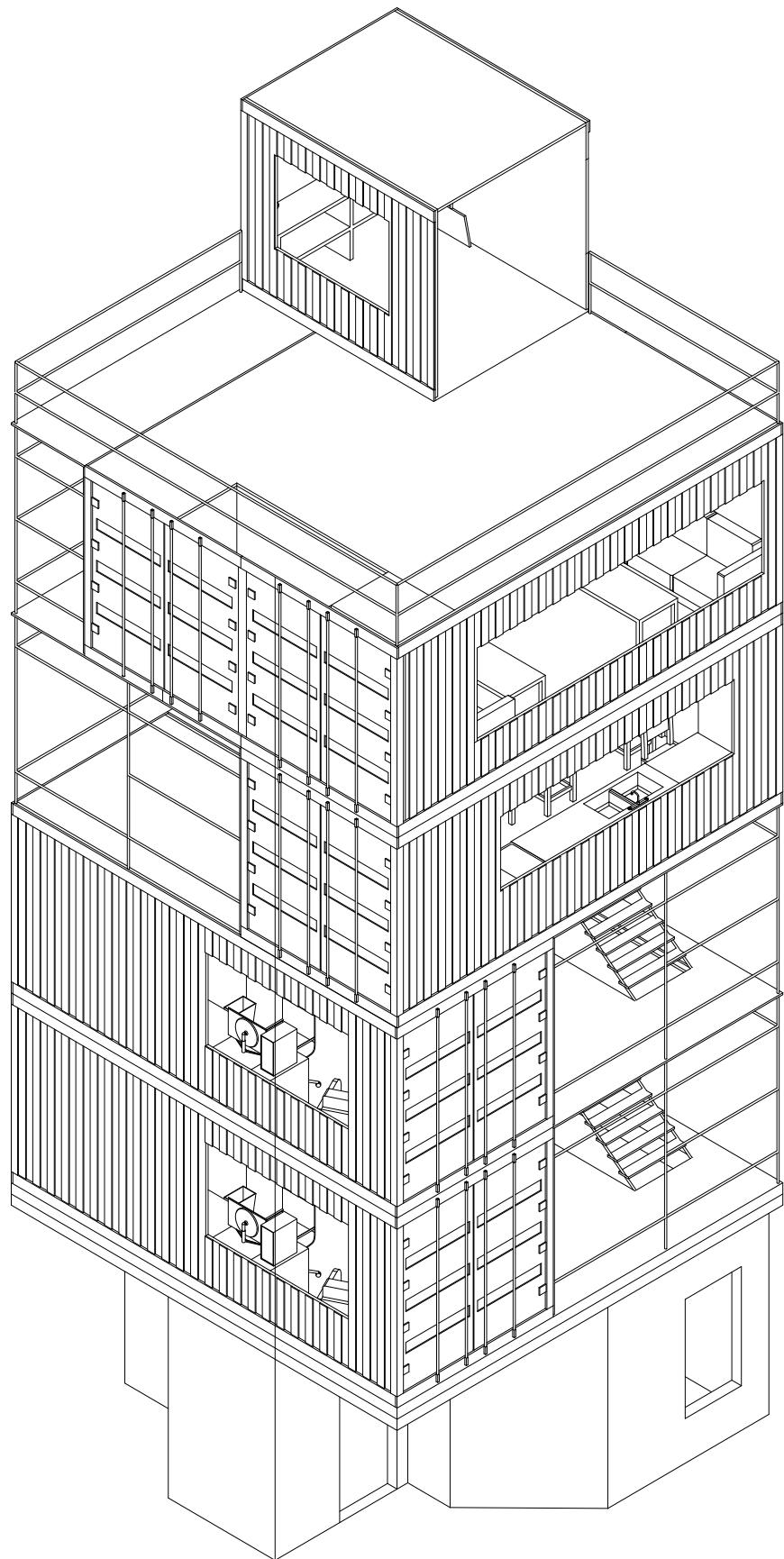
These design iterations took primarily from assignment three, attempting to incorporate verticality as a way to grow away from the existing environment I find so restraining.

The initial prototypes show a clear through-line to the final outcome, but feel far too structural and fail to stay properly withining the floor plan of the existing space.

The shipping crate prototypes represent a turning point in the design process, as I began to focus more on developing modular elements that could be rearranged, added or removed to fit the needs of their occupant. These modular elements are the core of an apparatus for growth and fulfill all of the initial goals and limitations for the piece. In this way there is no single apparatus for growth, it is instead whatever the occupant chooses to do with the modules at any given moment that defines the apparatus.

The Rhino 7 models and digital graphics produced in assignment four have set a standard for my work going forward, and manage to encapsulate both the assigned work and content I am personally passionate about.

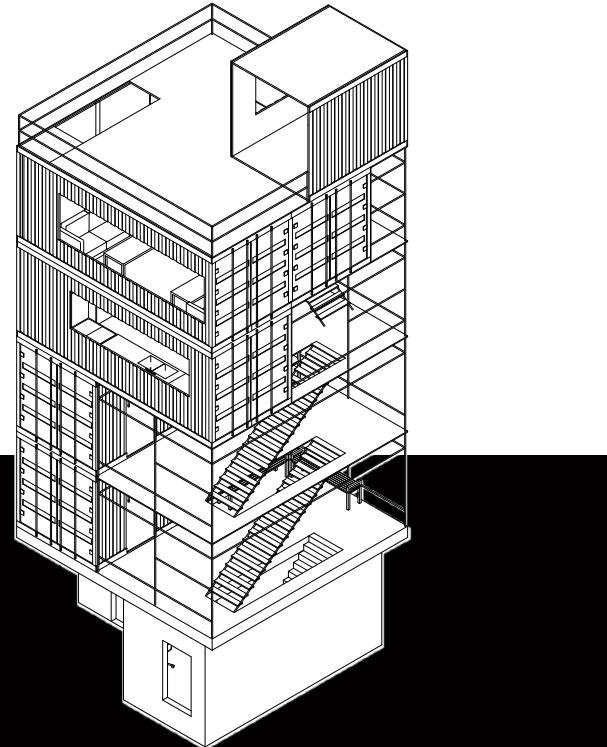
## ***ASSIGNMENT 4*** ***AN APPARATUS FOR GROWTH***



joe sanders, *an apparatus for growth prototypes*, 2023

# AN APPARATUS FOR GROWTH

ADDRESSING UNUSED SPACE UPWARDS ; MODULAR CONSTRUCTION FOR MODERN LIVING



## INTRODUCTION

an apparatus for growth is a system of modular shipping container and scaffolding elements designed to be affixed to rooftop space of low to mid rise apartment or office buildings in attempts to remedy resident complaints through personalized purpose and evolving design

## INTENTION

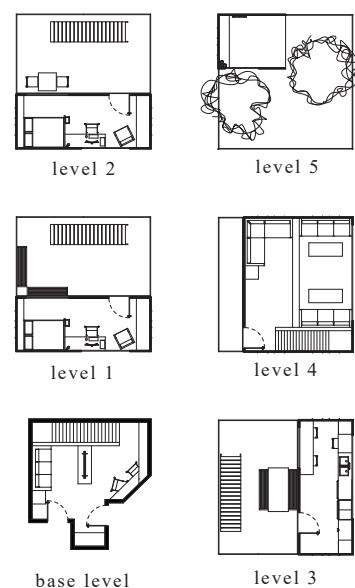
to address and utilize abundant unused space

to elevate the accessibility of design through division of construction into simple modular elements

to apply inexpensive materials to ground the project in reality and initiate conversation surrounding capital and design

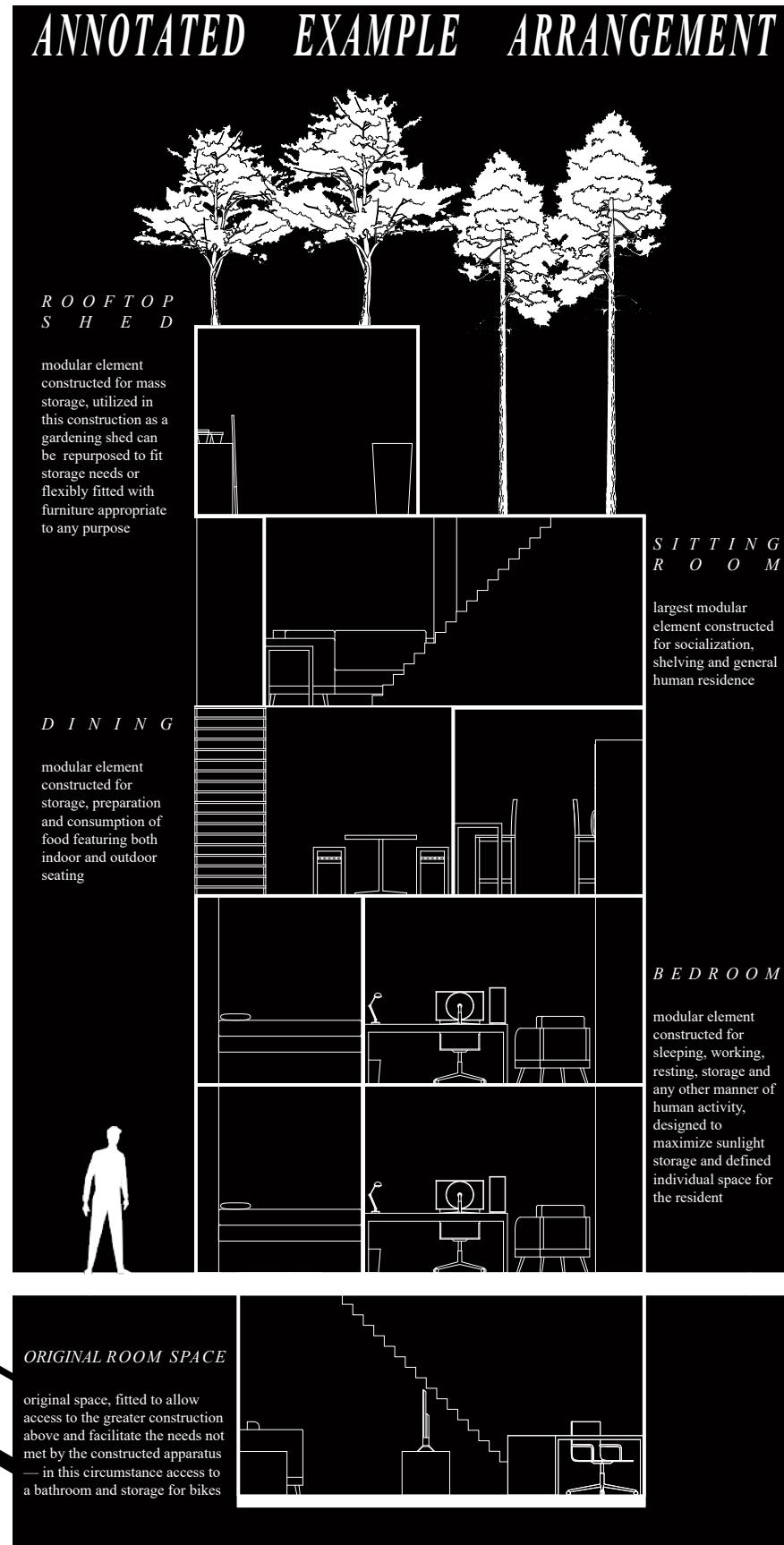
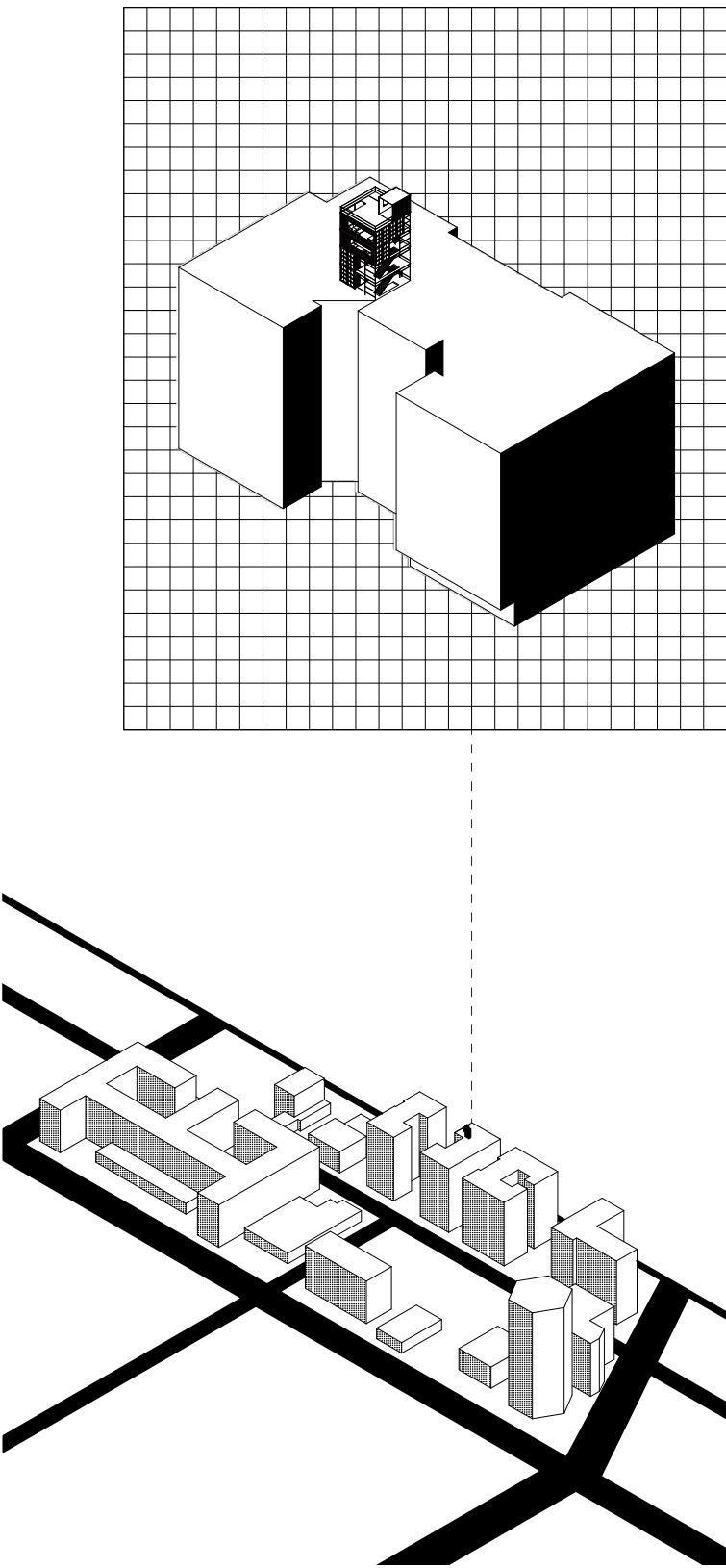
to incorporate elements that bolster self-sufficiency, independence and personal growth

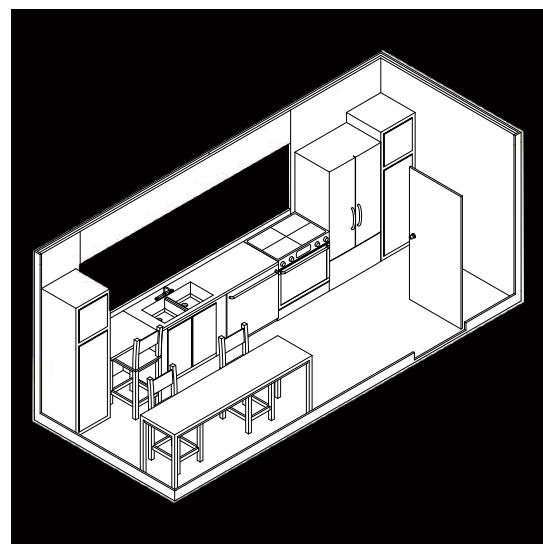
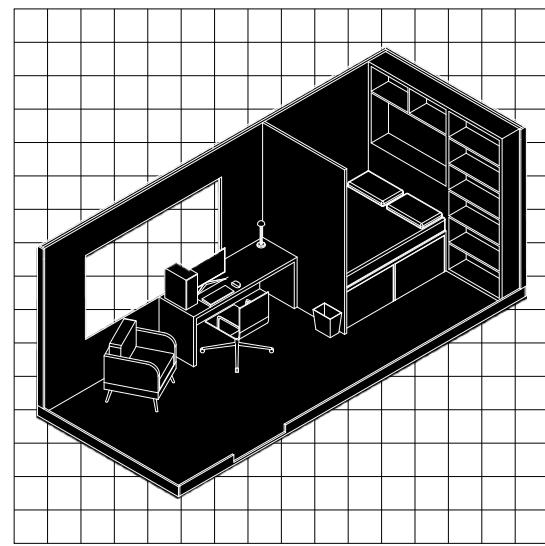
I M A G I N E D  
S P A C E



E X I S T I N G  
S P A C E







## CLOSING THOUGHTS

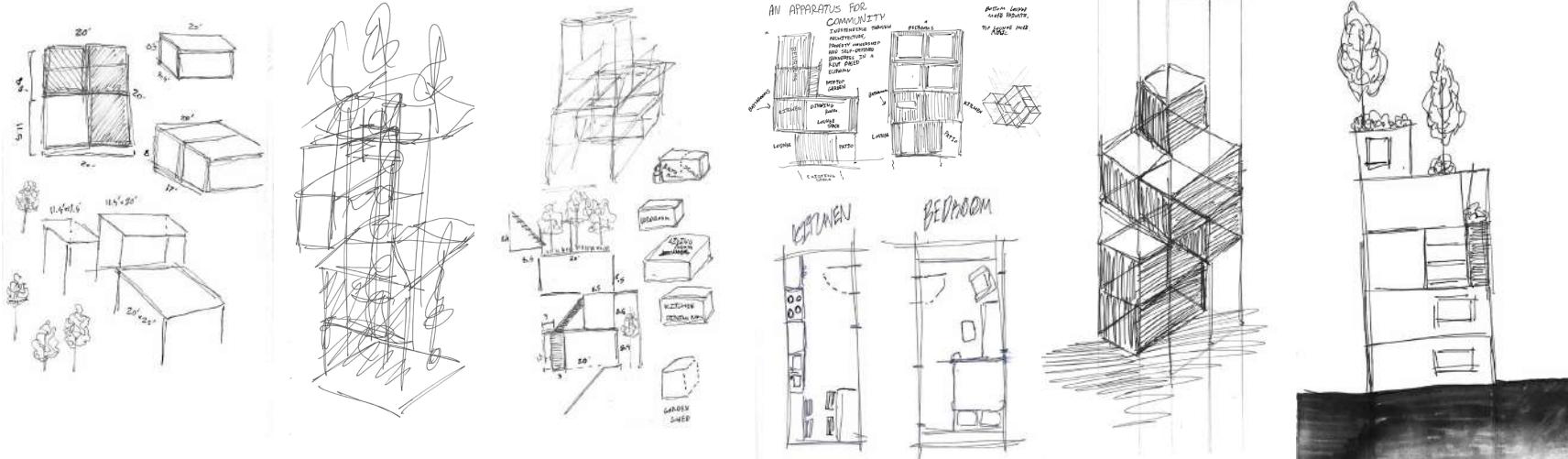
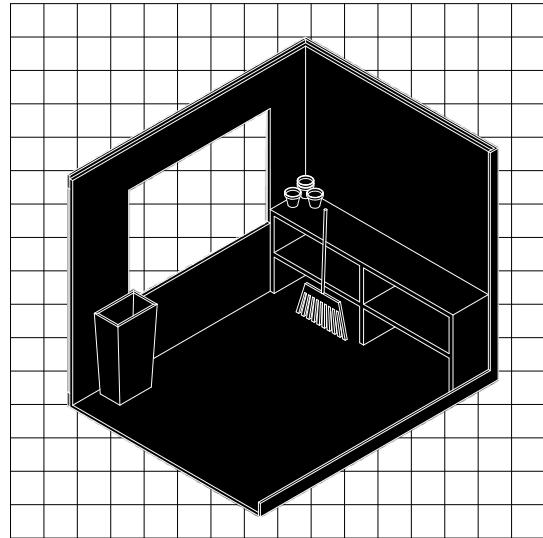
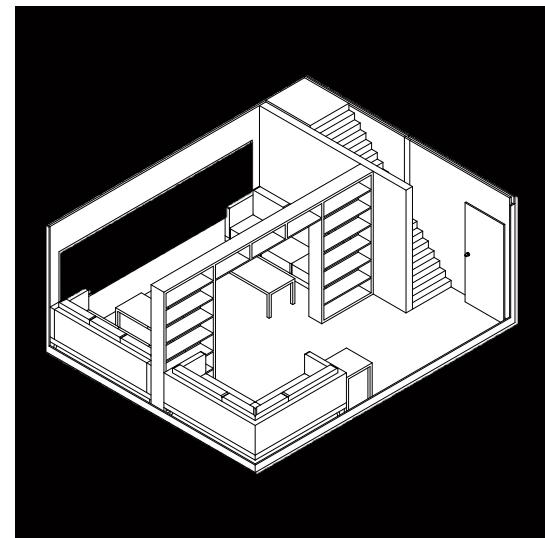
The modular structures that make up an apparatus for growth were initially intended only to address the issues I have with my personal living situation, but I quickly found my dissatisfaction with the space to be rooted in the greater emergence of modern architecture as a way to limit social and economic mobility antithetical to the architectural values of aesthetic, social, and environmental design.

With the return on wealth surpassing the return on labor, the necessities of low-income housing increase, with the amount of individuals renting their property nearly doubling in the past fifty years – from roughly 21% in 1965 to a staggering 43% in 2016.

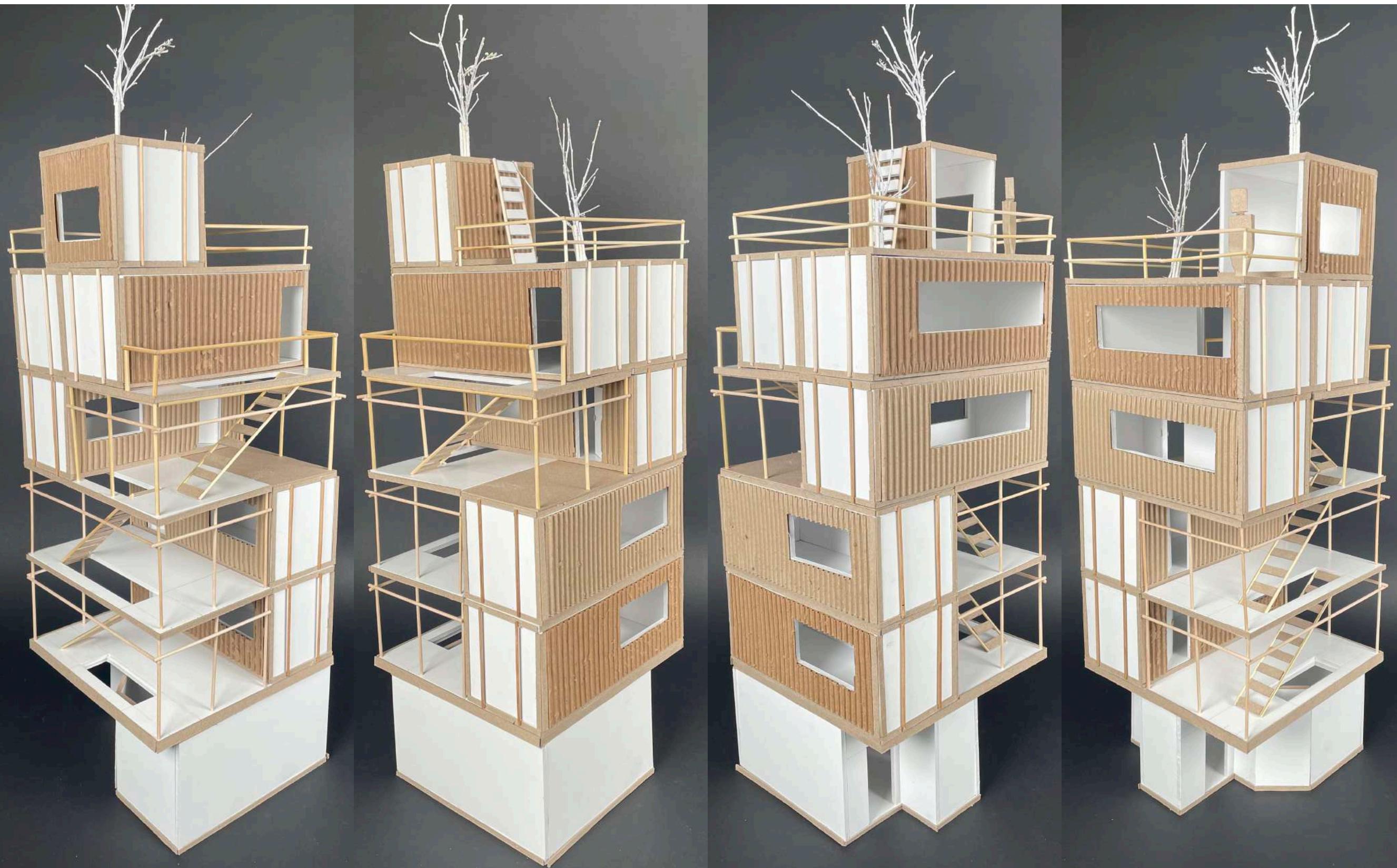
With the median down payment of a house in the United States averaging twenty thousand dollars, millions of American renters find themselves in a position where they can shoulder the financial burden of monthly house payments but lack the savings to make a down payment. This system funnels a considerable percentage of their income into renting, preventing savings and maintaining their position of low economic status. This issue is only posed to get worse with a study from MetLife Investment Management predicting institutional investors may control 40% of single family homes in the United states by 2030, further driving up rent and housing costs.

An apparatus for growth succeeds in addressing the issues of property ownership by allowing an individual to amass their owned property piecemeal, expanding as their income allows without requiring large initial investment. Cheap material and simple construction propose a city above our own, with homes atop highrises. A focus on storage, environmentalism, and function facilitates a living scenario that is not only inexpensive but inspiring.

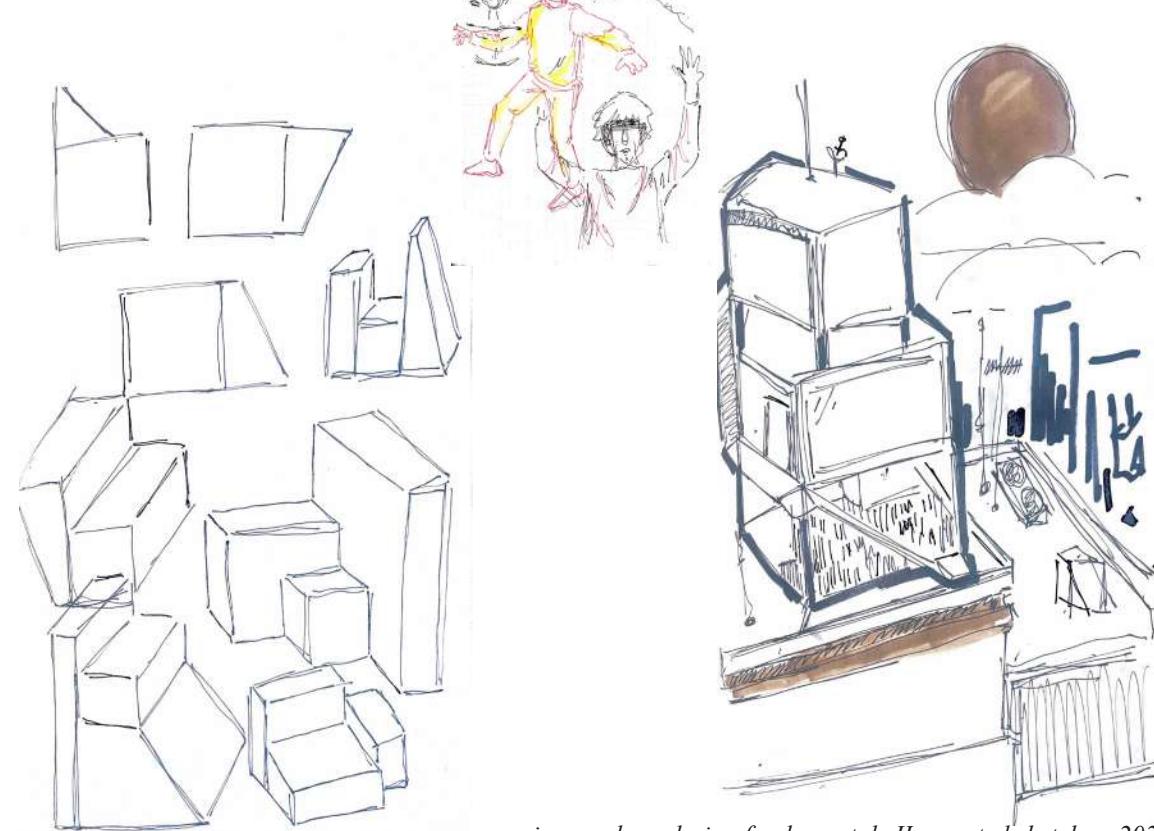
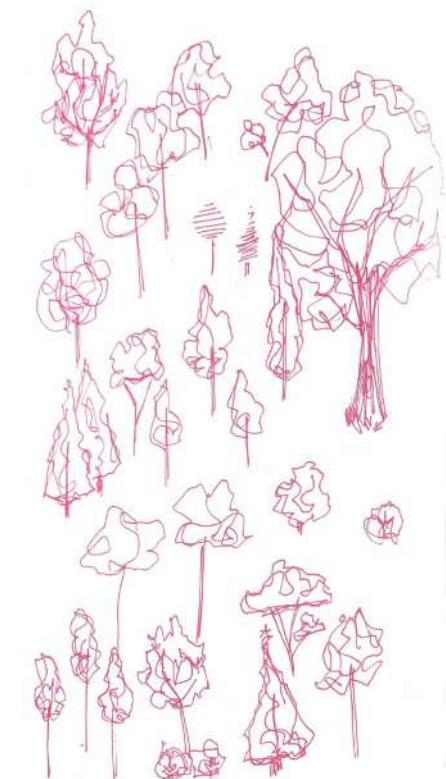
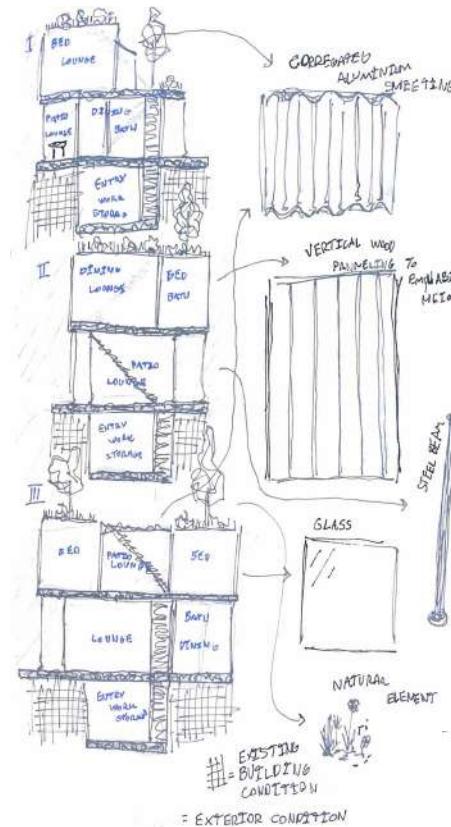
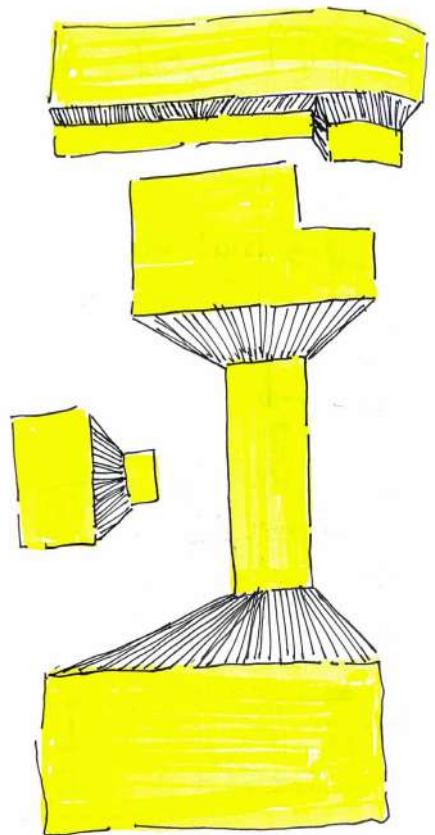
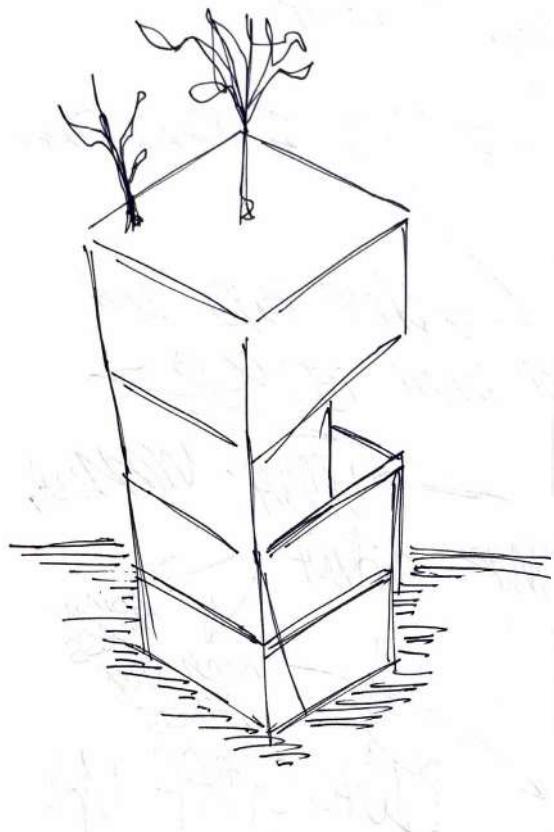
The primary failure of an apparatus for growth exists in its position amongst established architecture. Just as the most ideal structures are reserved for those that can afford them, an apparatus for growth is reserved for the top floor. While an apparatus for growth finds short term success in addressing the limited social mobility brought about in a rent-based living scenario, it fails to address the issue long term in the way a complete restructuring of constructed space with a focus on communal living and public property potentially could.



joe sanders, an apparatus for growth graphic, 2023



joe sanders, *an apparatus for growth prototypes*, 2023



joe sanders, design fundamentals II assorted sketches, 2023



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