

PORTFOLIO



Juwan Nam
Columbia University
MSAAD 2023



01

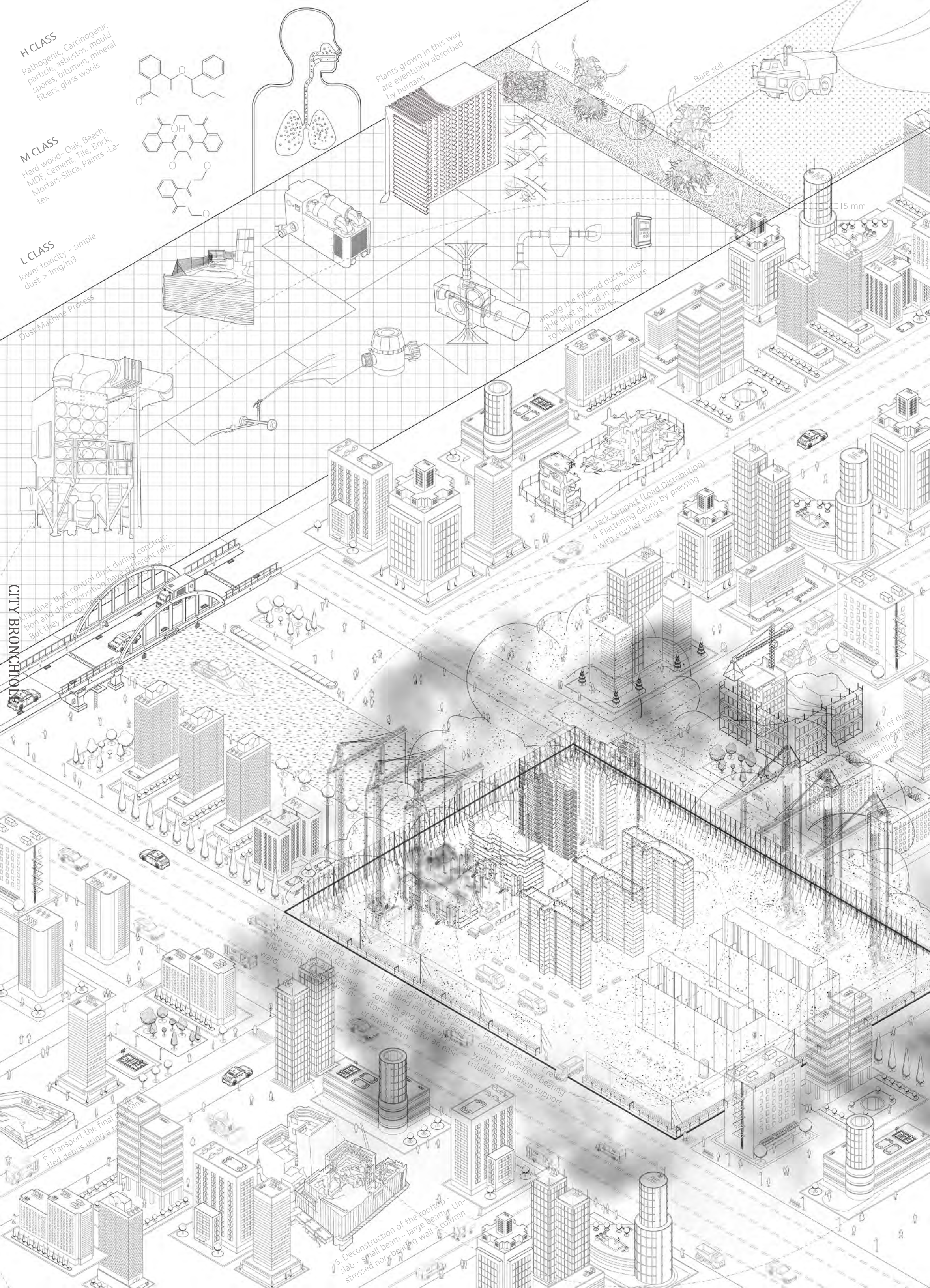
CITY BRONCHIOLE

Columbia Univ Advanced Studio V
Instructor: Nahyun Hwang
Individual Work
Fall 2022

This project is about the influence of demolition dust on the human body and the urban environment.

While I were researching the related topics about air, I noticed that dust lung has been a very common occupational disease especially in Asia, where a large number of development and redevelopment happens. The toxic airborne dust spreads everywhere around the site and damages the human body and the environment. It is very commonly happening around us, railways, factories, mine caves etc.

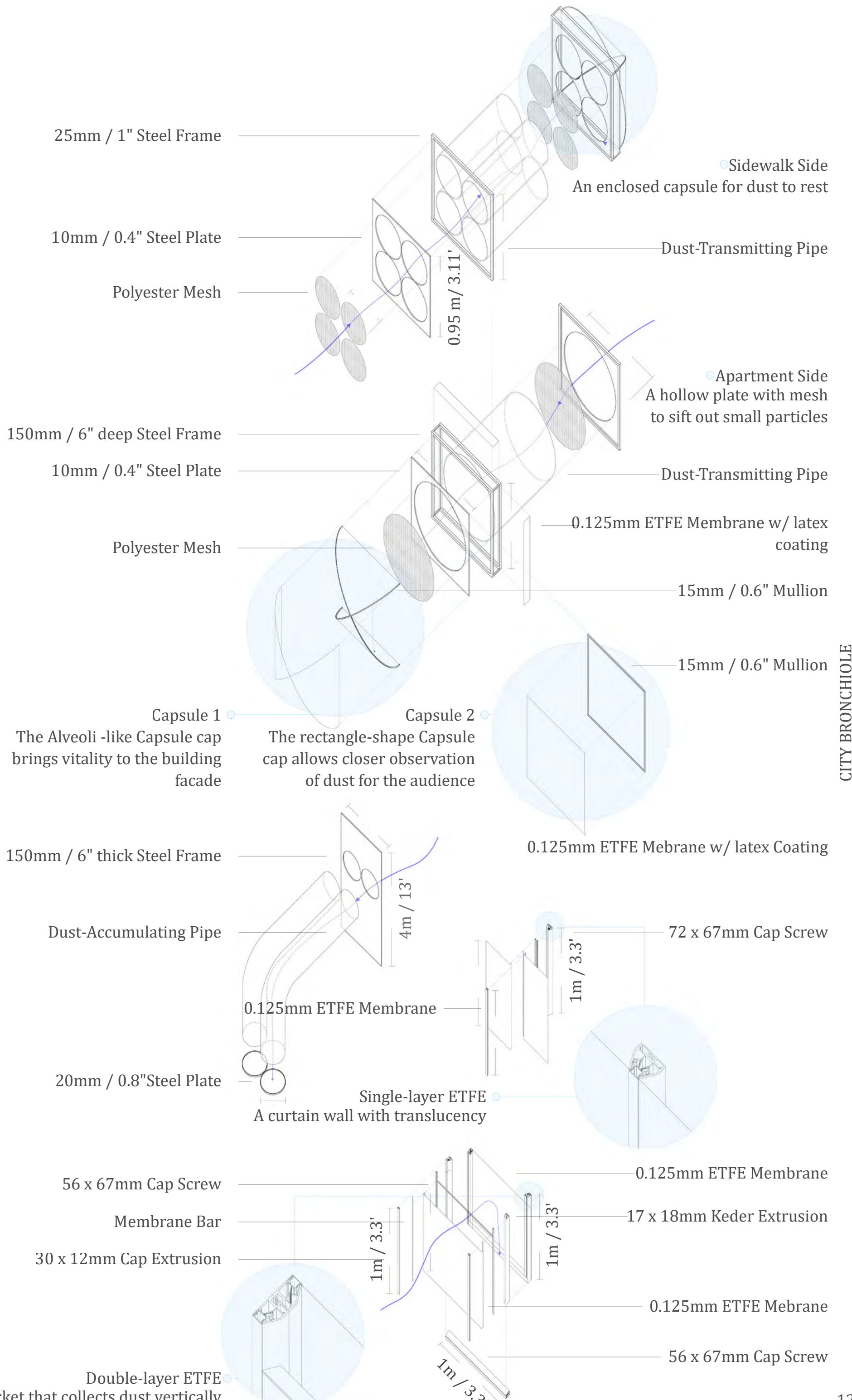
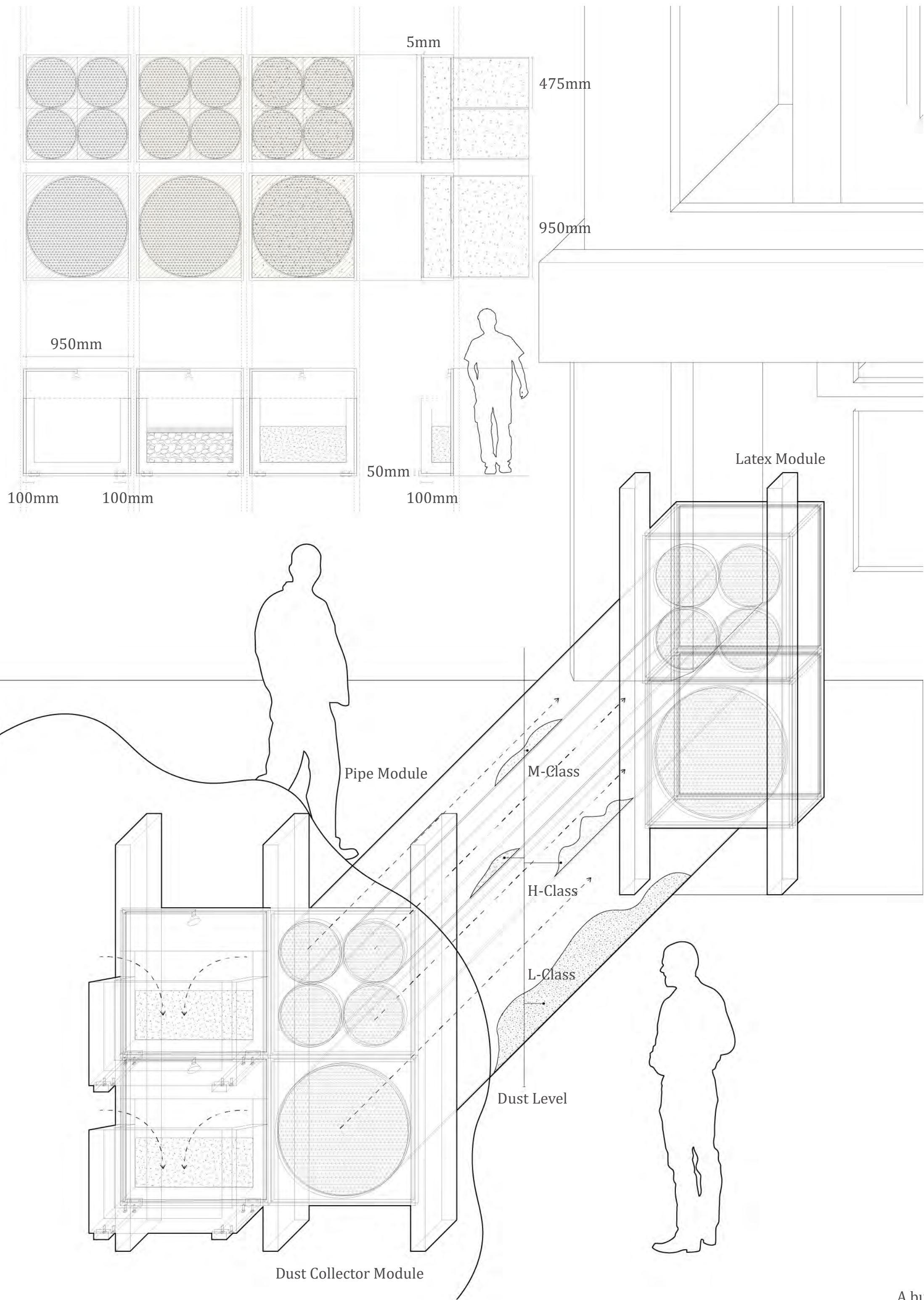
This analysis started from the research and investigations on construction sites and the political and economical phenomenon behind it.

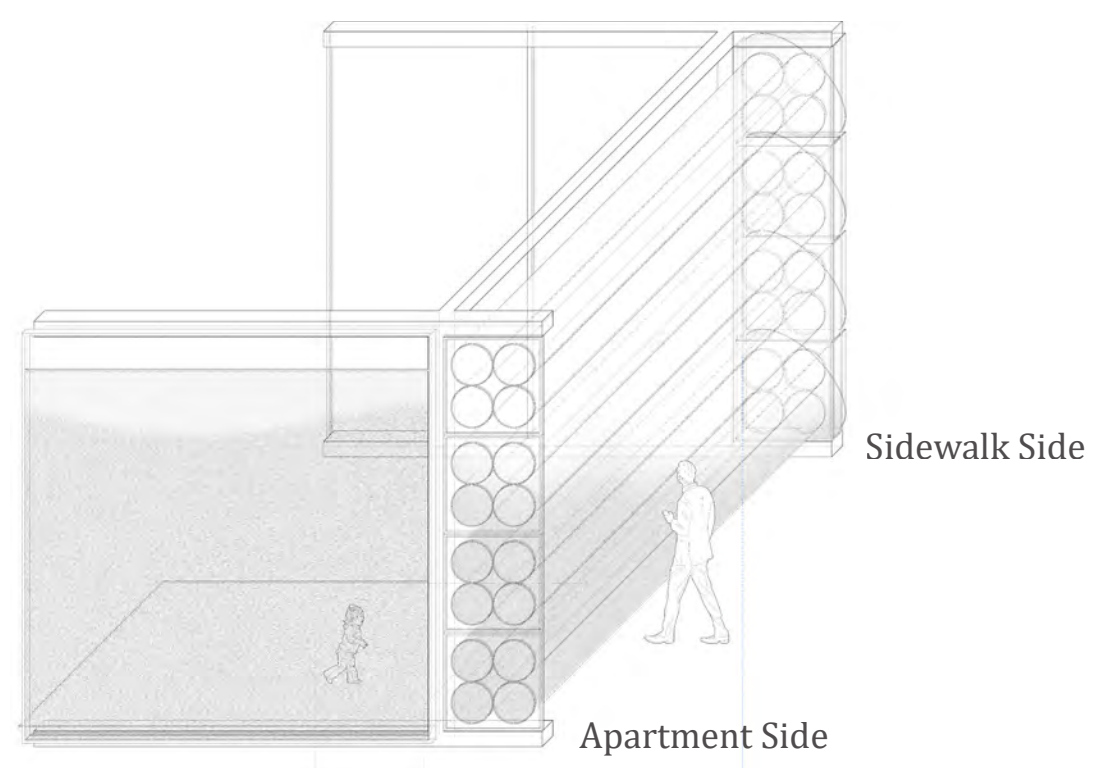


This analysis drawing attempted to visualize the process of JAEGAEBAL in old apartment complexes.

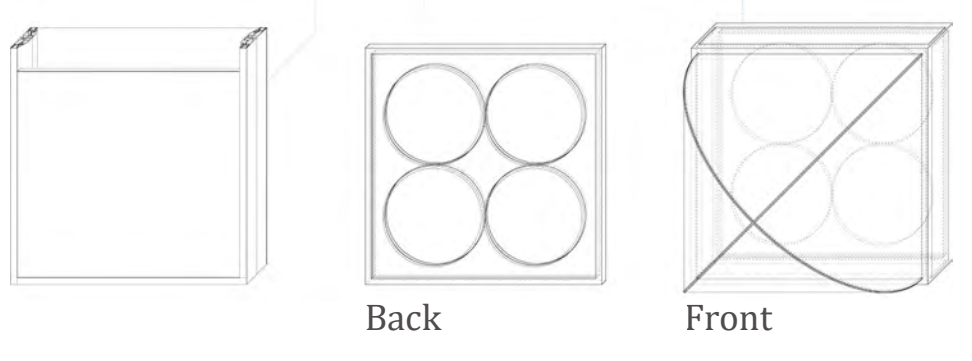
JAEGAEBAL means the process of the owner of the apartments demolishing their building and rebuild it on the same area. And this is the urban analysis illustrating the frequency of JAEGAEBAL in Seoul. Among all types of demolition, implosion is the easiest but the most harmful way. It leads us to notice and focus particularly on implosion demolition.

Outside of the implosion-demolished building, there are three types of fences. The first is the tall scaffolding fence that allows workers to remove any dangerous and unnecessary structures, such as the facade, from the building. The second is the dust barrier, to prevent pedestrians from the dangerous construction site and block the dirt from the city. The third fence is the pedestrian walkway, to keep people from being injured by the falling pieces.



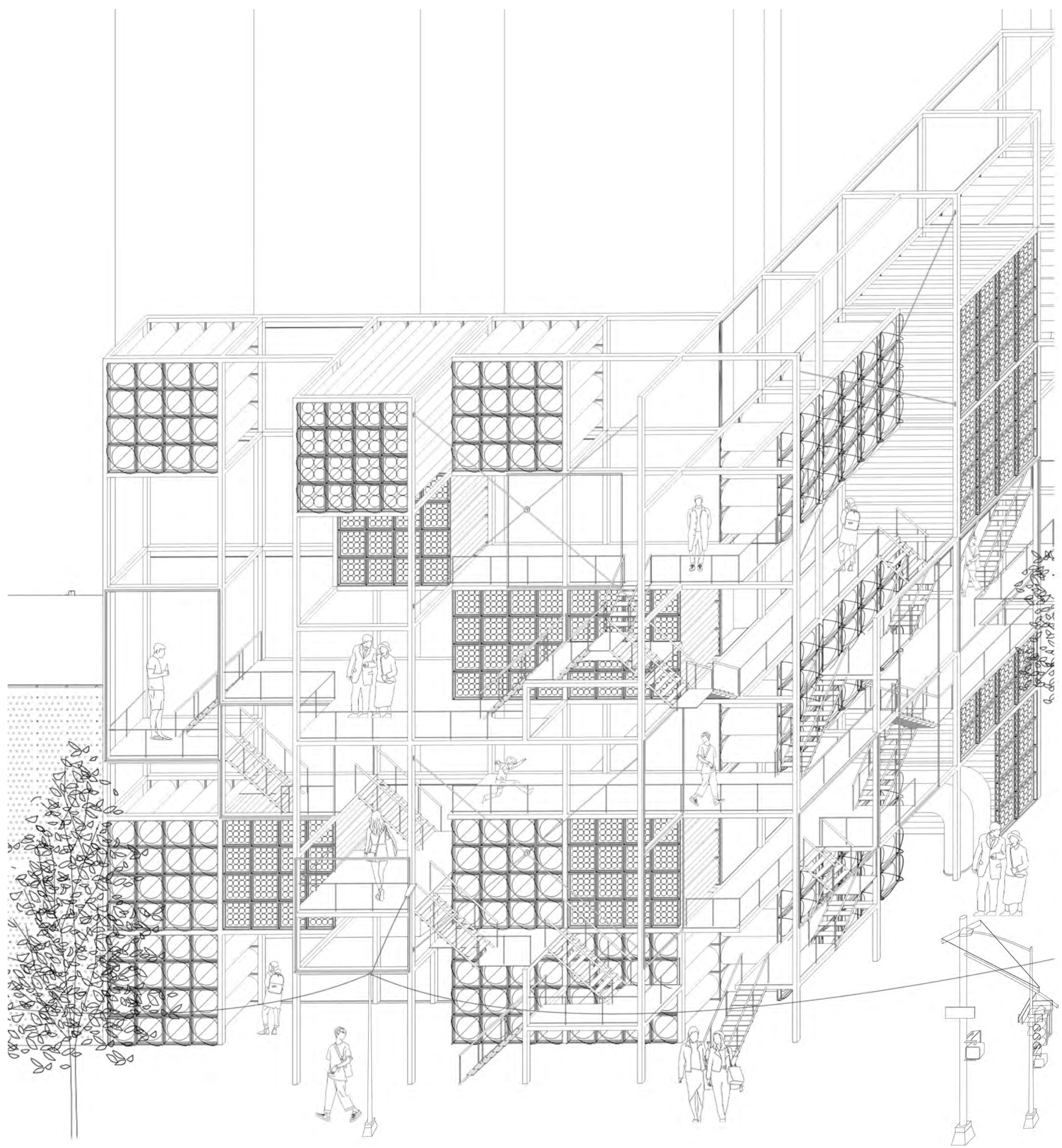


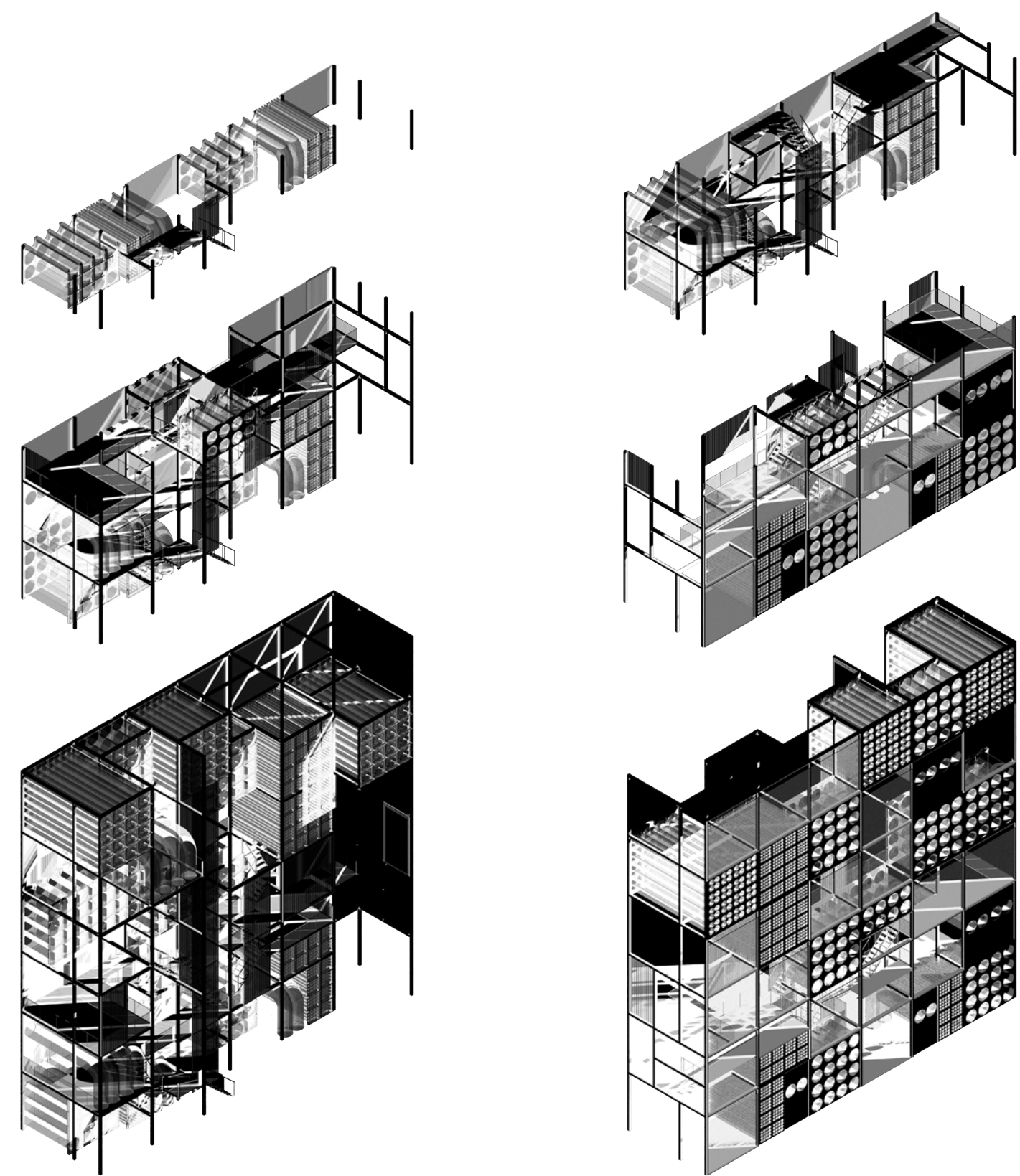
Dust Visualizing Module



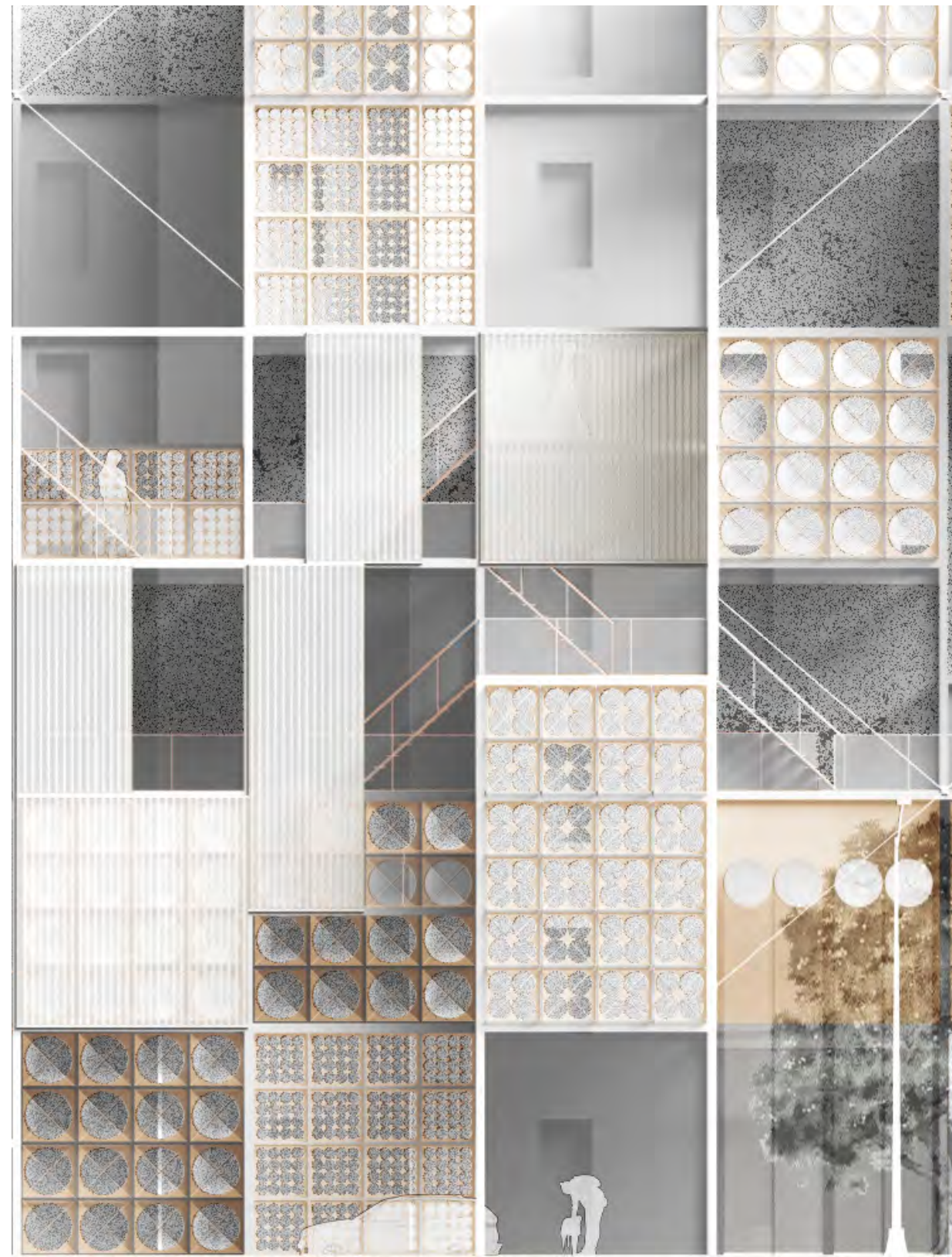
The dust from implosion on the demolition site will be distributed around the site and gets collected or transmitted via layers in the different modules.

The dust collector showcases the dust in all sizes vertically. The dust visualization module's layers allow it to sift different sizes of dust: Inhalable Particles, Thoracic Particles, and Respirable Particle.



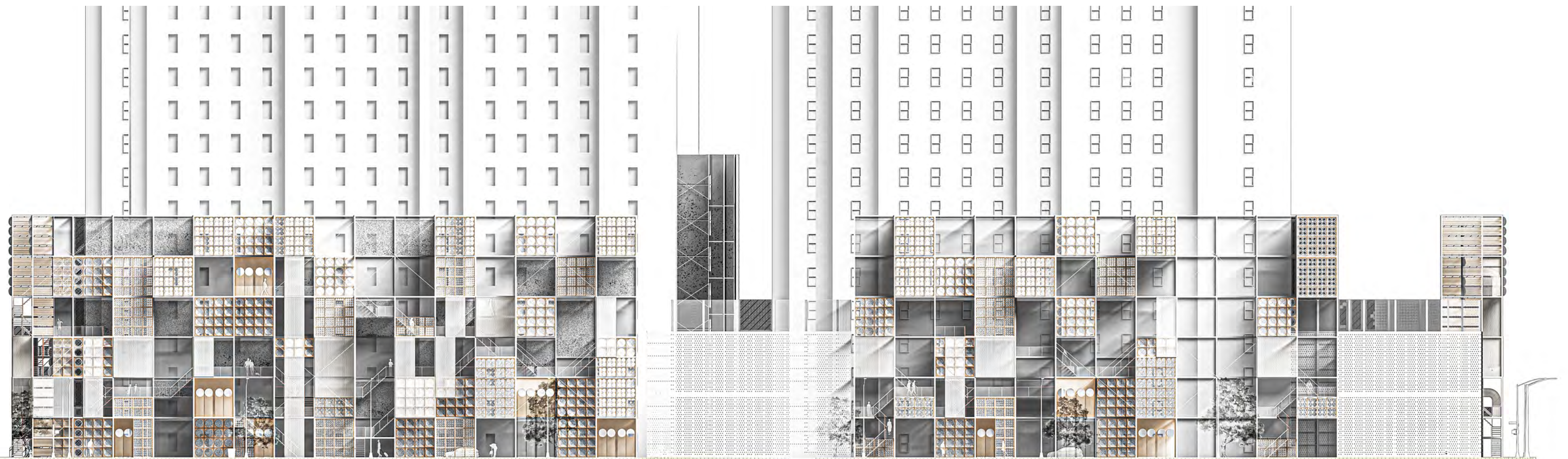


I tried to express how our intervention memorizes, visualizes, and shows dust to people. When implosion occurs, dust is diffused by gravity and wind, and the diffusion range is determined by the weight of the dust molecule. Dust enters the wall through layers in the modules and remains at different locations. The pipes are also different in size to vary the effect of dust landing. The audience in the wall experience the specialized dust generated from people's desire for 'JAEGAEBAL'. The narrowness of stairs and platforms allows the audience to focus more on the dust and inner site.



The dust being collected will reflect on the facade, the etfe module becomes darker and the capsules stand out. It shows a timeline of demolition gradually and allows people from further distance to notice it.

As the modules are randomly arranged in the building, the circulation generated from it becomes flexible. It is a meandering pathway that allows people to walk all the way around the site. And the translucency of materials gives people semi-private spaces to enjoy their own moments.





The original fences connect the walls to prevent people from entering the site.

The overall structure works as a translucent layer between the dirty site and the clean, organized urban area. Its aesthetic attracts people's attention and reinforces the influence of the demolition site on the city and people's daily life.



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CAVE BUREAU

Columbia Univ Advanced Studio IV
Instructor: Kabage Karanja & Stella Mutegi
Individual Work
Summer 2022

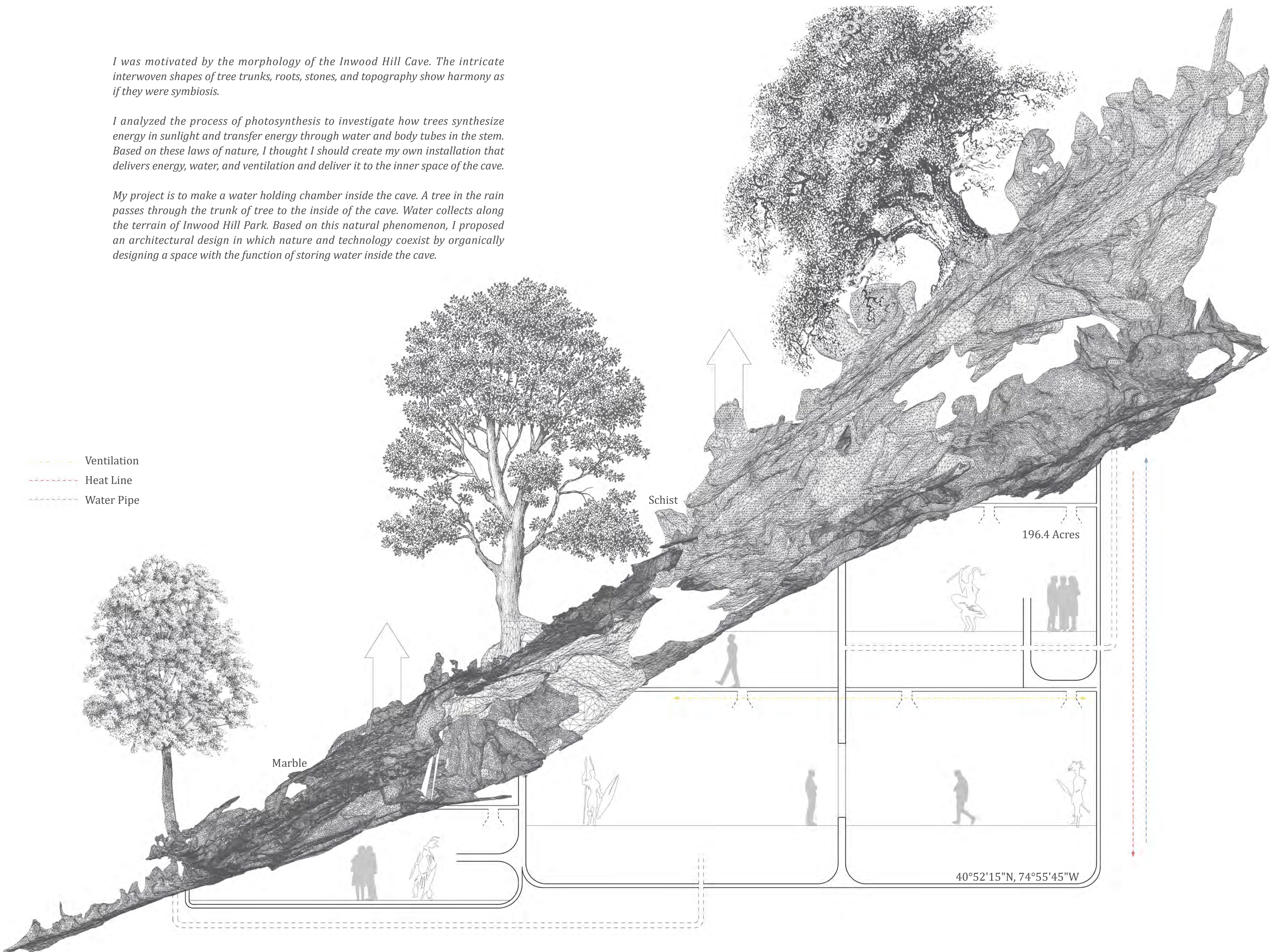
From an architectural and broader city reinscribing standpoint, this studio extended its 'grammars of geology' to re-assess, re-evaluate, re-dress and re-imagine museum mapping and making in the age of the Anthropocene.

It cautiously harnessed and recalibrated these tools to address the museum from the perspective of present-day evolving customary practices. That is, from the artifactual formations of new objects of meaning and transcendence. The studio re-assessed practices of 'museum' re-reading to factor in the nuances of human trauma, resistance, and healing on the multiple socio-geological and architectural scales necessary to shape what a museum and, by extension, the re-reading of 'civilisation' in this epoch could and probably should be.

I was motivated by the morphology of the Inwood Hill Cave. The intricate interwoven shapes of tree trunks, roots, stones, and topography show harmony as if they were symbiosis.

I analyzed the process of photosynthesis to investigate how trees synthesize energy in sunlight and transfer energy through water and body tubes in the stem. Based on these laws of nature, I thought I should create my own installation that delivers energy, water, and ventilation and deliver it to the inner space of the cave.

My project is to make a water holding chamber inside the cave. A tree in the rain passes through the trunk of tree to the inside of the cave. Water collects along the terrain of Inwood Hill Park. Based on this natural phenomenon, I proposed an architectural design in which nature and technology coexist by organically designing a space with the function of storing water inside the cave.



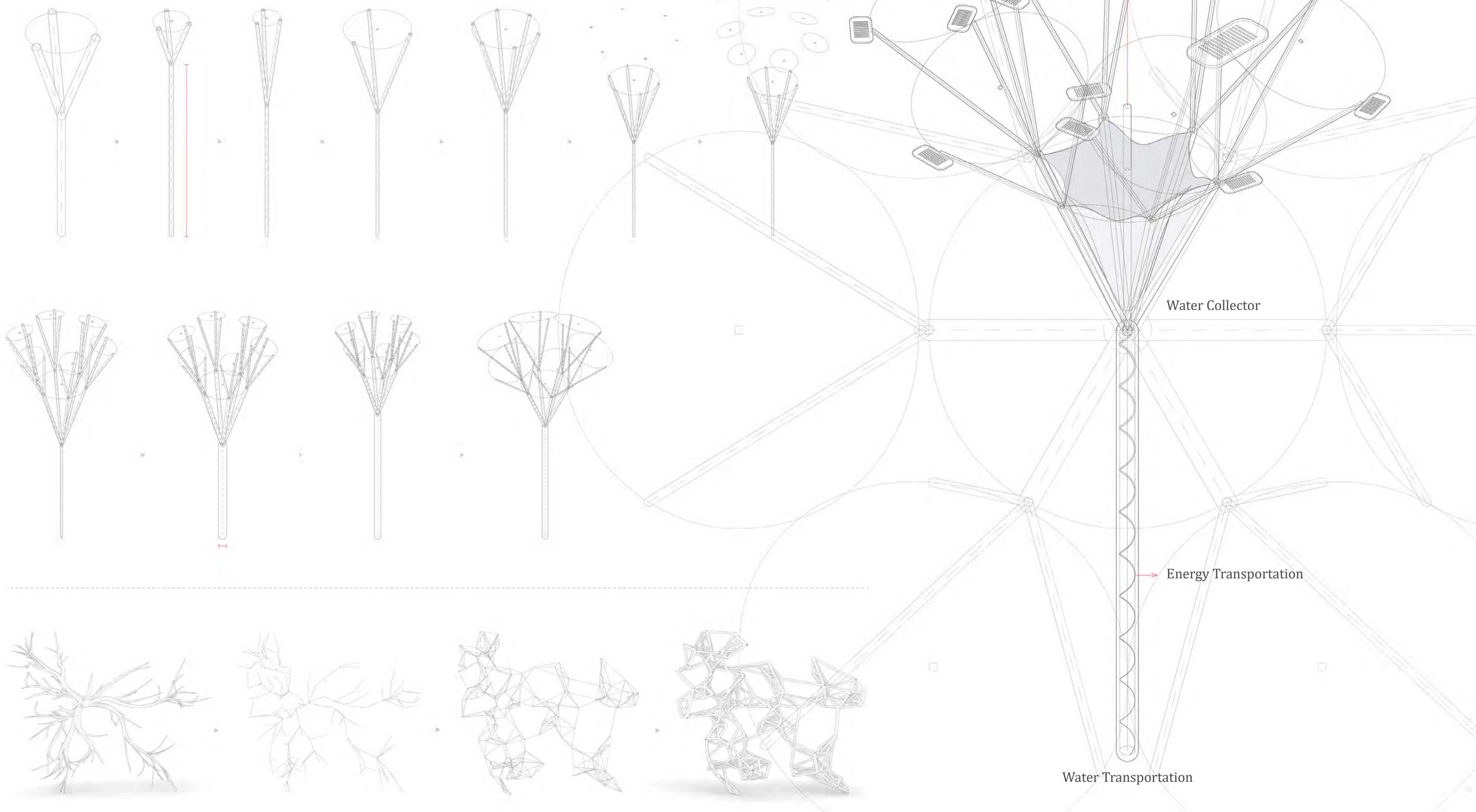
CAVE BUREAU

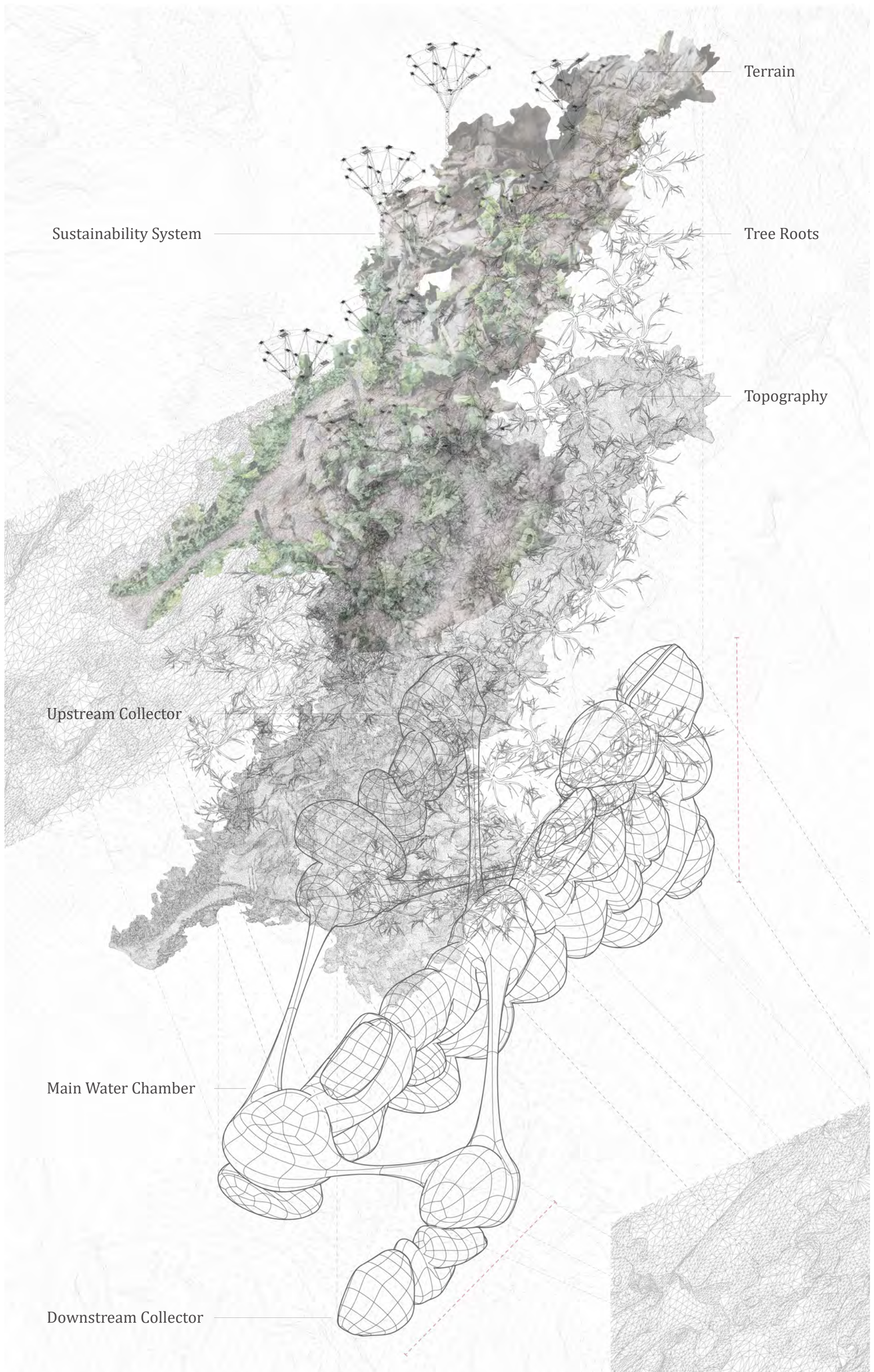
CAVE BUREAU

I tried to reinterpret the process of photosynthesis. I designed the machine by dividing it into two main branches, the trunk and the root of the tree.

It was set higher than the tree in the In-wood terrain to efficiently synthesize energy, and a bundle-type stem was formed using a loop system to widen the range of the stem. Solar panels were installed at the end of the stem. In the middle of the installation, a water collection pocket was installed to collect water, and the thickness of the stem was increased as it went down in the direction of gravity so that efficient water transfer could occur.

The roots are designed as thin and complex as possible so that the process of reabsorbing the remaining water into the soil at the end of the water transport stage can occur as efficiently as possible. This is a moment in which the human technology involved in providing a comfort inside the cave communicates with nature.





Sustainability System

Terrain

Tree Roots

Topography

Upstream Collector

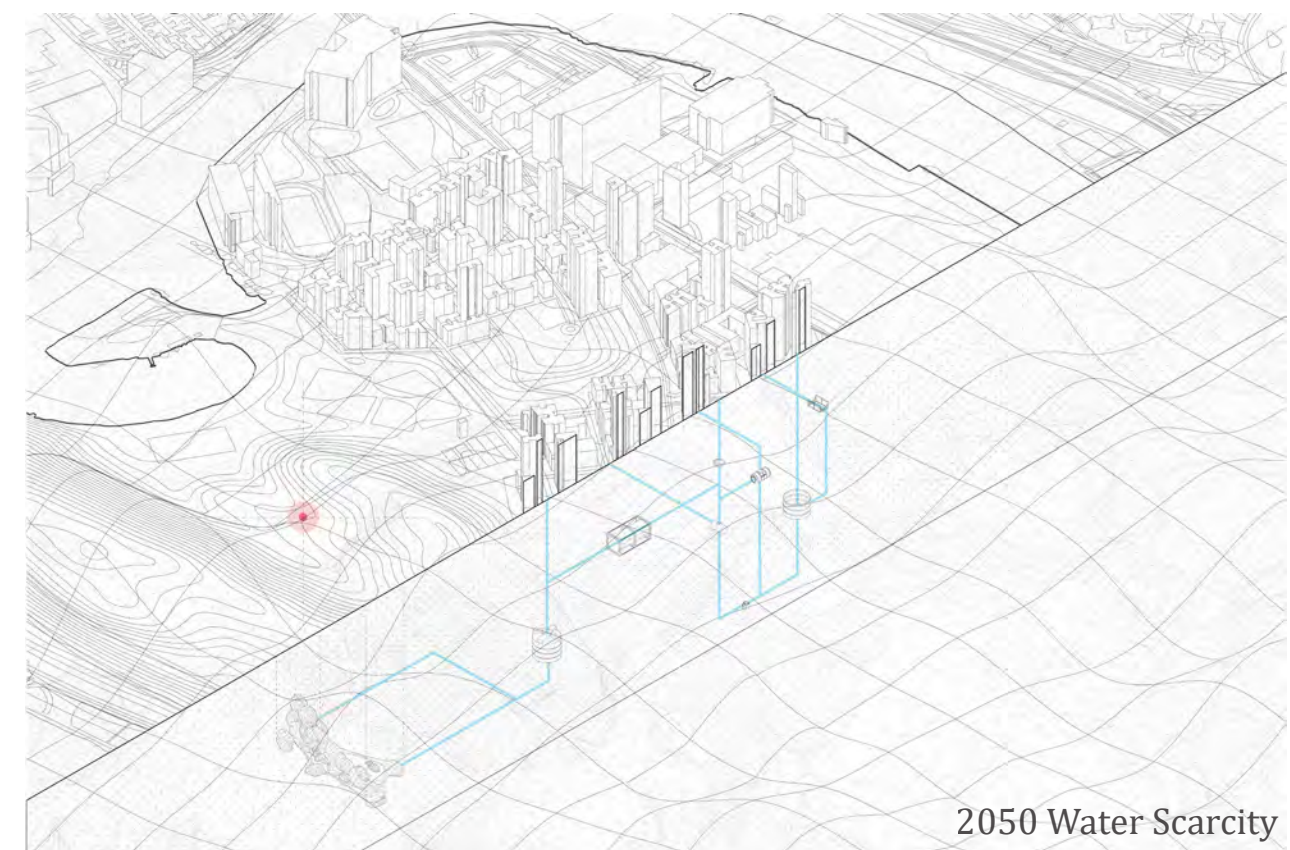
Main Water Chamber

Downstream Collector

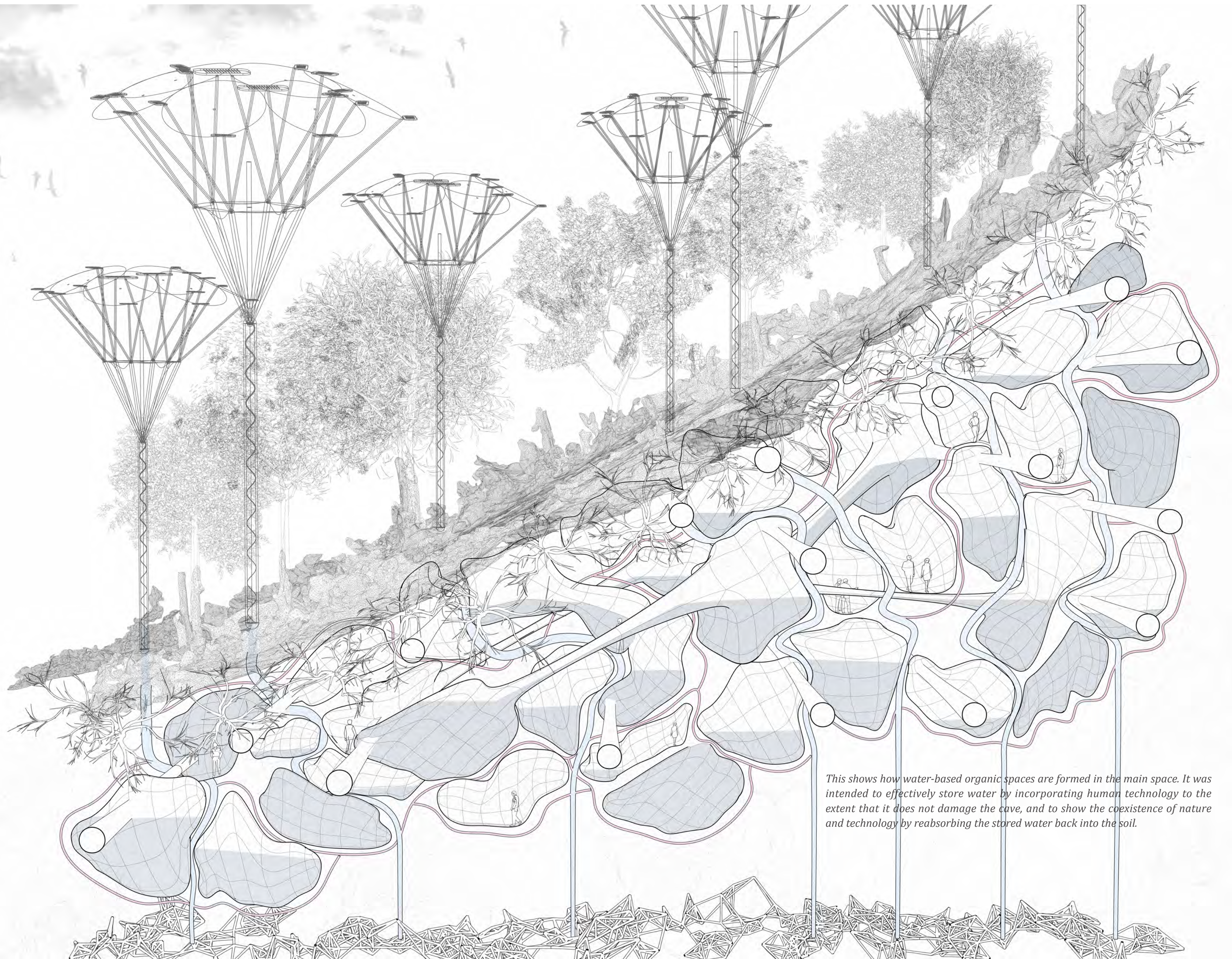
In Designing the lower space of the cave, the unique topographic pattern of the inwood cave was used. an atypical space was designed so that the lower space could be organically woven with trees, stones, and topography.

The main space in the center is a water holding chamber which people can experience organic space with comfort supported by the man made technology like tree root system. the water transport pipe is the main which penetrate the overlapped space. and the heat & Energy pipe wound around the water pipe overgrow between the space to support the heat. the ventilation pipe penetrate the space.

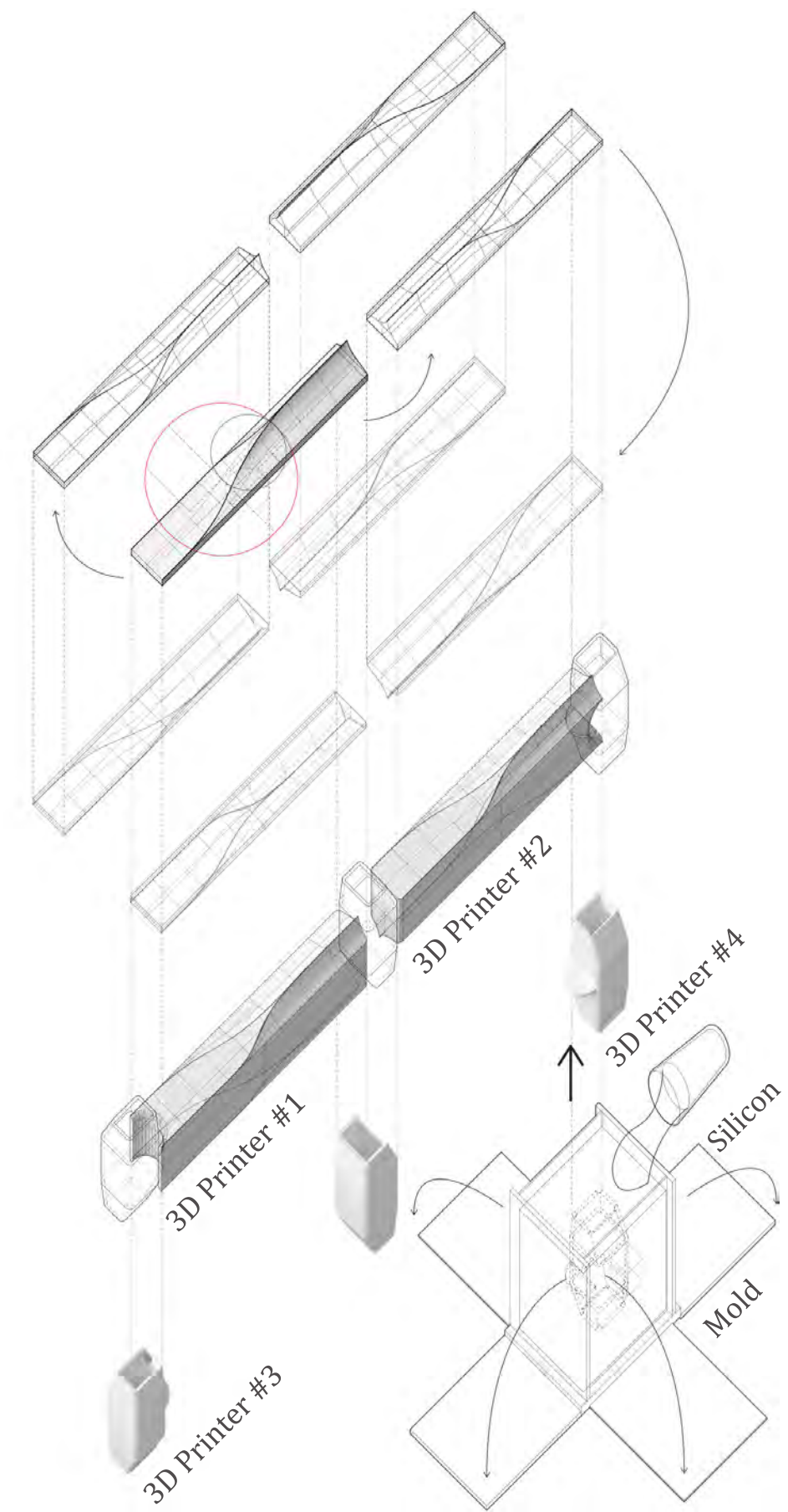
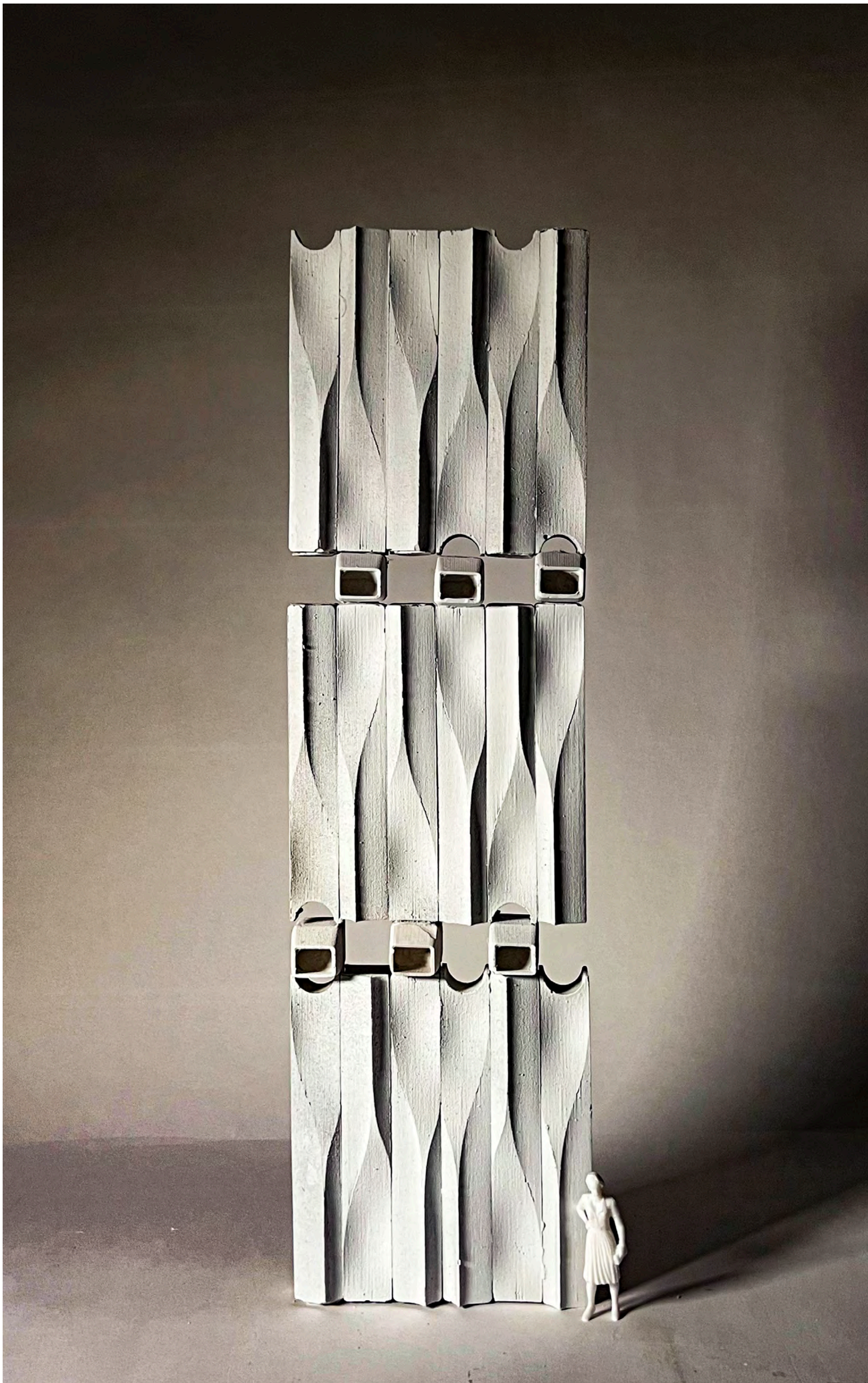
Two auxiliary spaces are formed around the main space. This space is only for the storage of water, and the quality of water is maintained by technology. This is a countermeasure to cope with the upcoming water shortage in Manhattan City in 2050. From a microscopic perspective, If Inwood's natural and human technologies coexist with each other through technology, it is the second stage of symbiosis between Inwood's natural space and Manhattan City using water in a macroscopic range.



2050 Water Scarcity



This shows how water-based organic spaces are formed in the main space. It was intended to effectively store water by incorporating human technology to the extent that it does not damage the cave, and to show the coexistence of nature and technology by reabsorbing the stored water back into the soil.



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Transitional Geometries

GSAPP Electives Tech Course
Instructor: Joshua C. Jordan
Individual Work
Fall 2022

To explore the organizational, experiential, and aesthetic performance of units and repetition in architectural composition. I considered the history and application of tiling effects and techniques in the making of architecture, as well as studied the geometric principles that lead to existing and potentially new systems of connections of parts.

To develop the skill sets involved fabricating the units: through mold-making, casting substances, and other shop-based materials and methods. I looked at moldmaking craft as an analog to construction logics writ large, efficiencies and economies of modular fabrication, and the development of fabrication systems that apply the lessons of the first trajectory in new and innovative ways.



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Techniques of Ultrareal

GSAPP Electives Tech Course
Instructor: Philip Crupi
Individual Work
Fall 2022

The use of perspective and rendering is often an afterthought. With the abundance of 3D modeling software and the ability to see every angle of a project instantaneously, renderings are often thought of as a last minute tool for representation. In addition to learning techniques for creating ultra realistic images, I focused on color, light, material, context, reflection, and opacity throughout the course of the entire design project. I looked for inspiration in many places, including art, photography and cinematography.

I used V-Ray 5.0 for 3D Studio Max 2022 as the main engine for exploration, and I explored additional methods of composition, including sketching and photography.