Born From The Installation

How do small devices affect large designs?

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Final Project

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Abstract

In the way of conventional architectural design, we usually think about site relevance, climate input, context connection and so forth. The site-based architectural design becomes the mainstream in the field of architecture today among the whole world. It is currently the practical and sophisticated way of designing, however, The mode of designing is turning to rigidity and template. It somehow limits the possibility of architectural design. When I study architectural design in the academy, I always think about Is there another approach to designing? The installation here is about the devices which are minor and subordinate to the architecture. It usually happens that we ignore its significance according to architectural design. Digging into the possible design of installation relating to architecture, the installation is actually an essential aspect of architectural design. The study of small devices could drive and lead the large final architectural design. In this portfolio, I would like to show how the small scale of installation study gradually lead and change the whole architectural design and ecology. Comparing to site-based architecture, the installation based architecture could be another approach for architectural design. During my 3-semester study of M. S. AAD at Cornell University, the study of an installation inspired and led my architectural design as always.

Keywords: architecture, installation, devices, architectural design, site, ecology

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Introduction

Strictly, as the interpretation of Merriam Webster, the definition of installation has two directions. One is the act of installing and the other is the state of being installed. Thus, when I talk about the installation here, it is about the minor and incomplex act and state comparing to the architecture. The study and research of installation significantly influence and guide the architectural design throughout the projects I present.

The following part will specifically discuss how the installation influences my architectural design in various aspects. Briefly, there are four parts to discuss. The first is the installation could be a potential stage and carrier for architectural design. The second is the installation becomes the art device to lead the architectural design and build a fantastic inward visionary ecology. The third is the installation creates a new system of ecology in architectural design. The fourth is the installation changed the original environment and ecology of the site.

In sum, the core idea is the small design of installation leads to the big change and influence of architectural ecology and the design borns from it.

1. The Stage

The installation gives the stage for architectural design to adjust the ecology of the district. The East 64th street to the East 82nd Street in Manhattan, New York City, is in the district of Upper East Side. As time goes by, the old buildings and apartments are maintained well by regulated inspection.

However, the advanced age and expensive status of Upper East Side caused the groups of residents are tending to be identical. Park Avenue blocks the subway tunnel stations underneath, and museums surrounded are like no connection. The area is actually losing its energy, temperament, and interest into cold and vapidity. After our observation and research, the installation of scaffolding on the facade could potentially become the stage for the displays and exhibitions to energize and enhance the quality of life.

1.1 Facade Inspection Safety Program - FISP

The regulation of inspection is previously known as Local Law 11, the New York City Department of Buildings' (NYCDOB) Facade Inspection Safety Program (FISP) requires that owners of buildings greater than six stories retain a professional engineer or registered architect to examine the building's exterior walls at arms-length every five years, and file a façade report (Fig. 1.).[1] The professional engineer or registered architect is also referred to as the Qualified Exterior Wall Inspector (QEWI). The overriding goal of FISP is to ensure that building facades are maintained regularly and properly, to reduce the risk of a falling-debris hazard to the public.

1. Buildings - Facade Inspection & Safety Program (FISP) Filing Instructions, Accessed May 15, 2019, https://www1.nyc.gov/site/buildings/safety/facade-inspection-safety-program-fisp-filing-instructions.page.

Course: A+U_Installation of Scaffolding
Summer 2018
Instructor: Nahyun Hwang, David Eugin Moon
Team: Shixuan Sun, Chen Shen, Maitai Kunawong

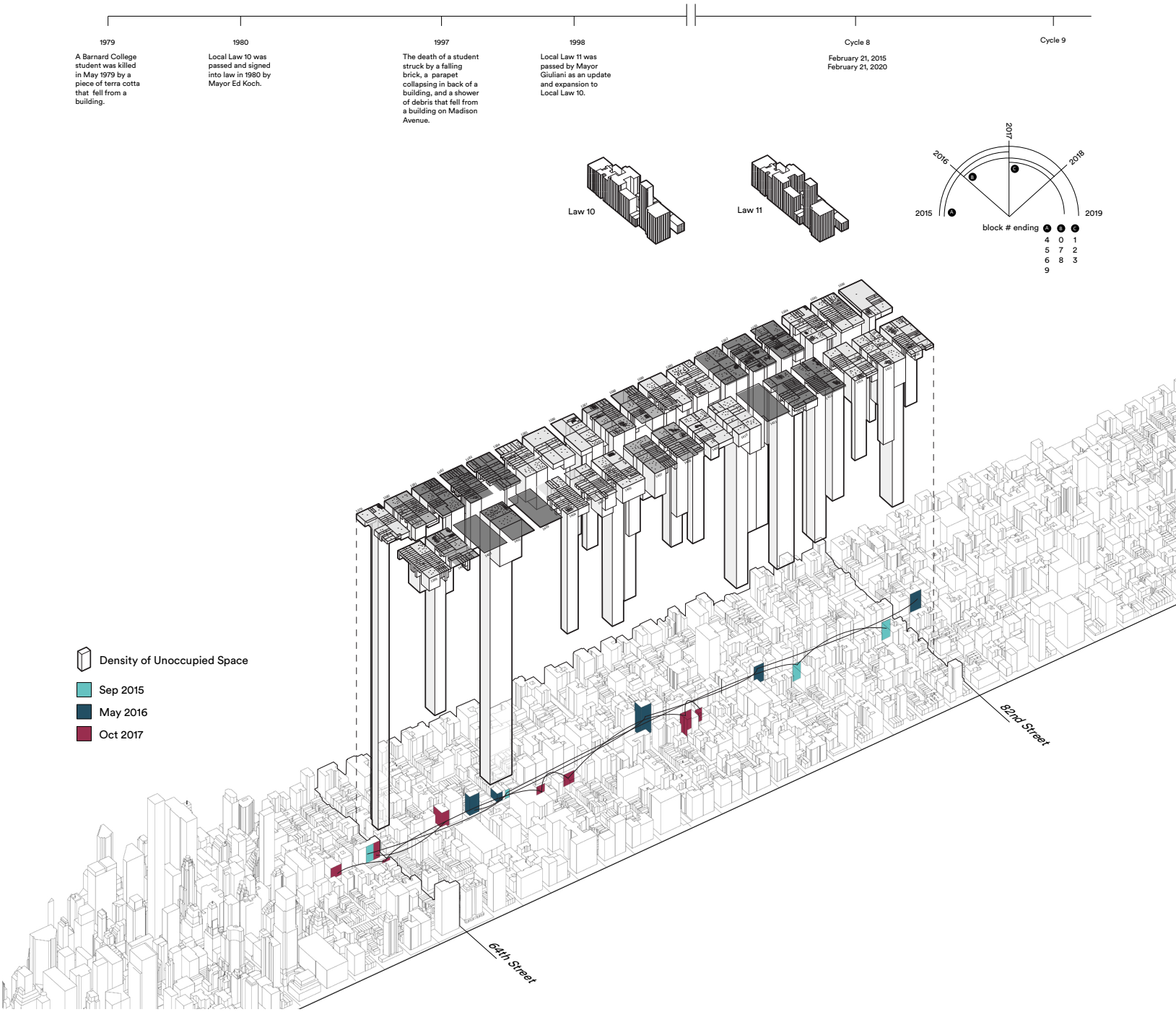


Fig. 1. Diagram of Regulation of Facade Inspection (Drawn by author)

1.2 Preservation & Restoration Process

The process of regulated facade inspection is actually the process of art shows since the old antique buildings contain sufficient artful and historic values (Fig. 2.). By taking advantage of the unoccupied space in the Upper East Side, the regulated inspection of facade could potentially become a moving art display museum. Such temporary construction would move along the Park Avenue, which brings the art into residents daily life and enhances their living quality.

In other words, the inevitable restoration process actually becomes the part of the ecology of the Park Avenue. Improving the installation of scaffolding and process of preservation would significantly benefit the ecology of the region.

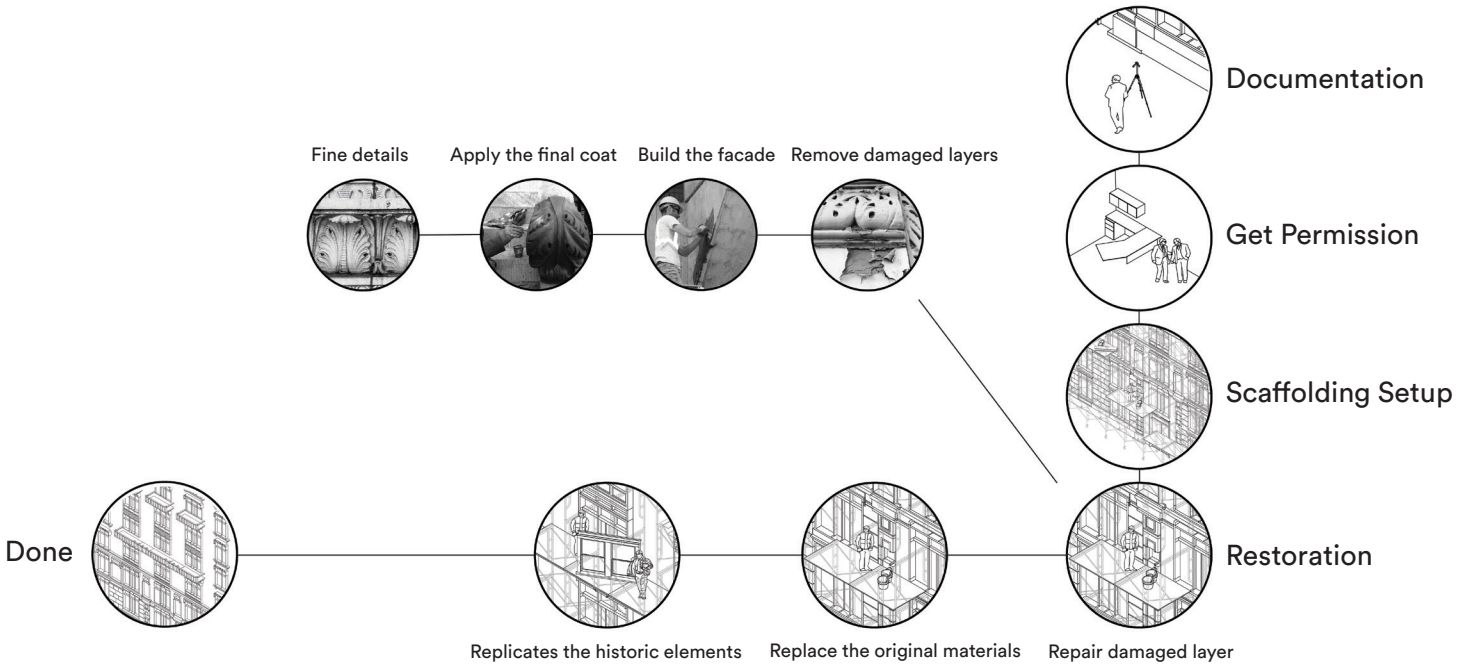


Fig. 2. Diagram of Preservation Process (Drawn by author)

1.3 Build on Scaffolding

The installation actually provides stages for functional constructions and interesting designs. Specifically, there are various types of spaces including rest area, exhibition, viewing and observation and so on (Fig. 3.) . This idea of design gives new meaning to the installation of scaffolding and improve the quality of living since the scaffolding on the facade is not good-looking.

On the other hand, the whole architectural design is born from the existing installation. The concept is that the designed installation with temporary constructions would have the potential to improve and change the atmospheric ecology of the area (Fig. 3.).

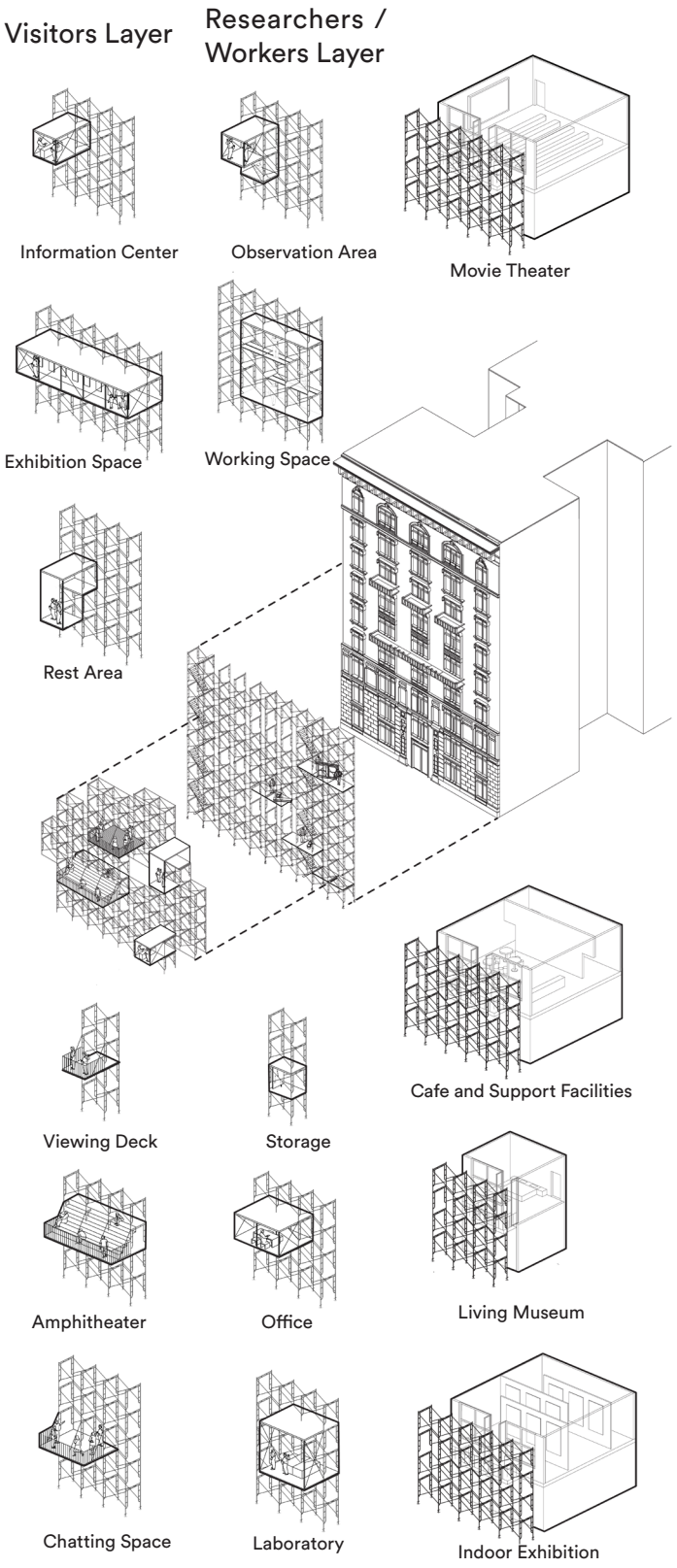


Fig. 3. Diagram of Typology (Drawn by author)

2. The Art

Academically, site-based architecture is definitely not the only solution for architectural design. Like the book, "Siteless: 1001 Building Forms" by Francois Blanciak, it is not site based architectural design but exploring the infinite possible forms.[2] Furthermore, to break the rules of conventions, doing experiments of the art devices could be a way to test the possibility of architecture. It is not only the test of visualization but also the test of space. Since the edge between art and architecture is a blur, the art could inspire and lead the final architectural design and create a new system of space.[3] In short, the study of art device could be another way to lead the architectural design and create a new type of ecology.

When we discussIllusions, we are seeking a way of visualization. It is actually a big issue in architectural design. Good visualization would significantly determine the success of the architectural design and help build up fantastic space. It may look irrational to believe that visualization of illusions could rationally change the space. However, the instinct of human-beings fundamentally is emotional animals. Every decision making is more or less affected by the senses and emotions. The architectural design is actually a way to manipulate the senses and emotions.

The library would be one of the best stages to display the fantasy of illusions. This project is to explore a track of artistic illusions and then inspire from the art devices to make the architectural design (Fig. 4.). So, the art devices could lead to the design of architecture rather than site-based architectural design.

2. François Blanciak, "Siteless: 1001 Building Forms," Cambridge, MA: MIT, (2008).
3. Jane Rendell, "Art and Architecture a Place between," London, (2017): 30-42.

Course: Optional Studio_Library of Illusion
Fall 2018
Instructor: Rubén Alcolea
Individual Work

Fig. 4. The illusion test of final model (Made by author)

2.1 Pygmalion's Spectacles

The inspiration is always found from the fleeting moment in life. When I was reading the comics, Gyo meaning "Fish", written by Junji Ito, and seeing the fishes landing, I interested about what kind of spectacles of vision got from different structures of fish eyes. What if people could take the structure and inspire the special spectacles.

Capturing the moment of the idea, I designed the device, the fish goggle. The concept is imitating the structure of fisheye, and seeing through the device to acquire the special spectacles in human perceptions (Fig. 6.) . Emphatically, since human and fishes are different species with different neural and brain structures, the design is only exploring the structure of the fisheye solely rather than imitating the vision accurately.

It is unpredictable to know the feeling before wearing the fisheye goggle. The goggle gives distorted circled vision with wide ranged views merged together. It makes people who are wearing it feel like floating in the center of the world (Fig. 5.) .

Show

Views Through Goggle

Fig. 5. The illusion test of wide range and floating (Made by author)

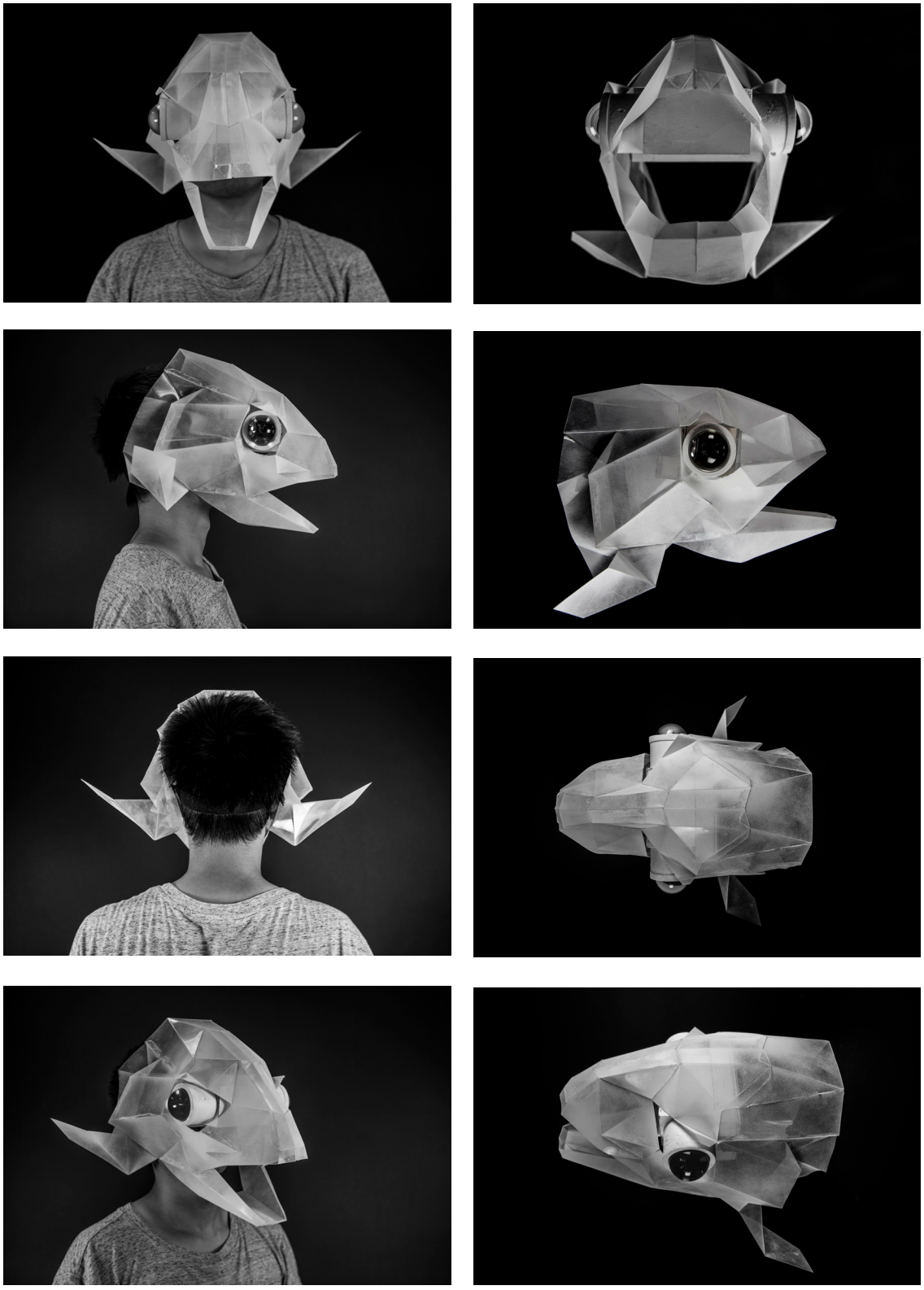


Fig. 6. The fisheye goggle (Made and photoed by author)

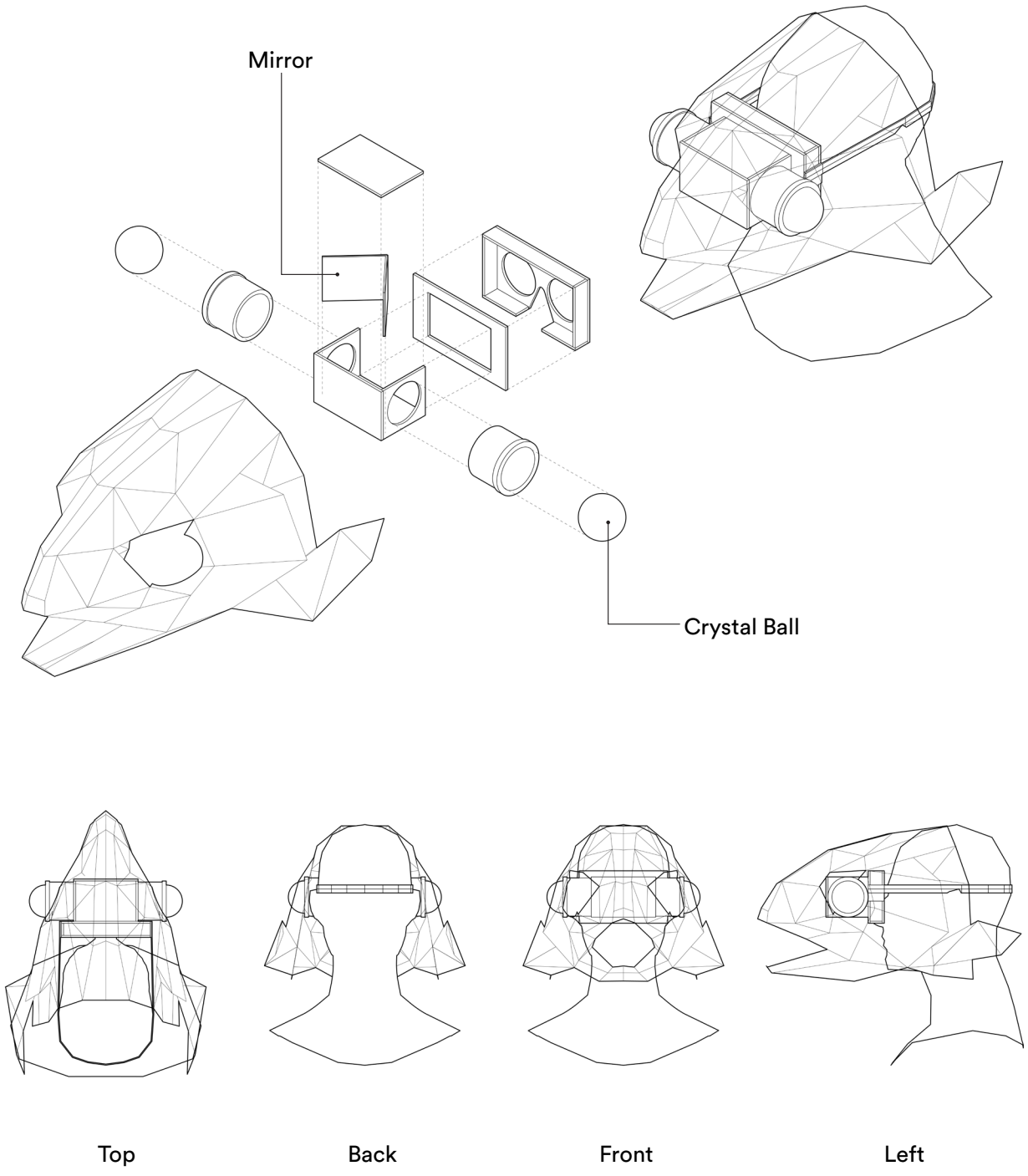


Fig. 7. Axon and axonometric split of fisheye goggle (Drawn by author)

2.2 The Veldt

The feeling of floating in the air when wearing the fish goggle inspired me like fishes swimming in the infinite ocean. The inspiration of infinity makes the project solid. Then the idea that people roam in the infinite books came out.

Applying the trick of two mirrors paralleling each other to create the illusion of infinity (Fig. 8.) . After finishing the model of the box, the exterior looking is a translucent limited box but when people see inside it is infinite volume of books and spaces. The contract differences between inside and outside inspired me the discussion of the idea of density. So, the prototype of the box tests the possible illusions would be achieved for the further design (Fig. 9.).

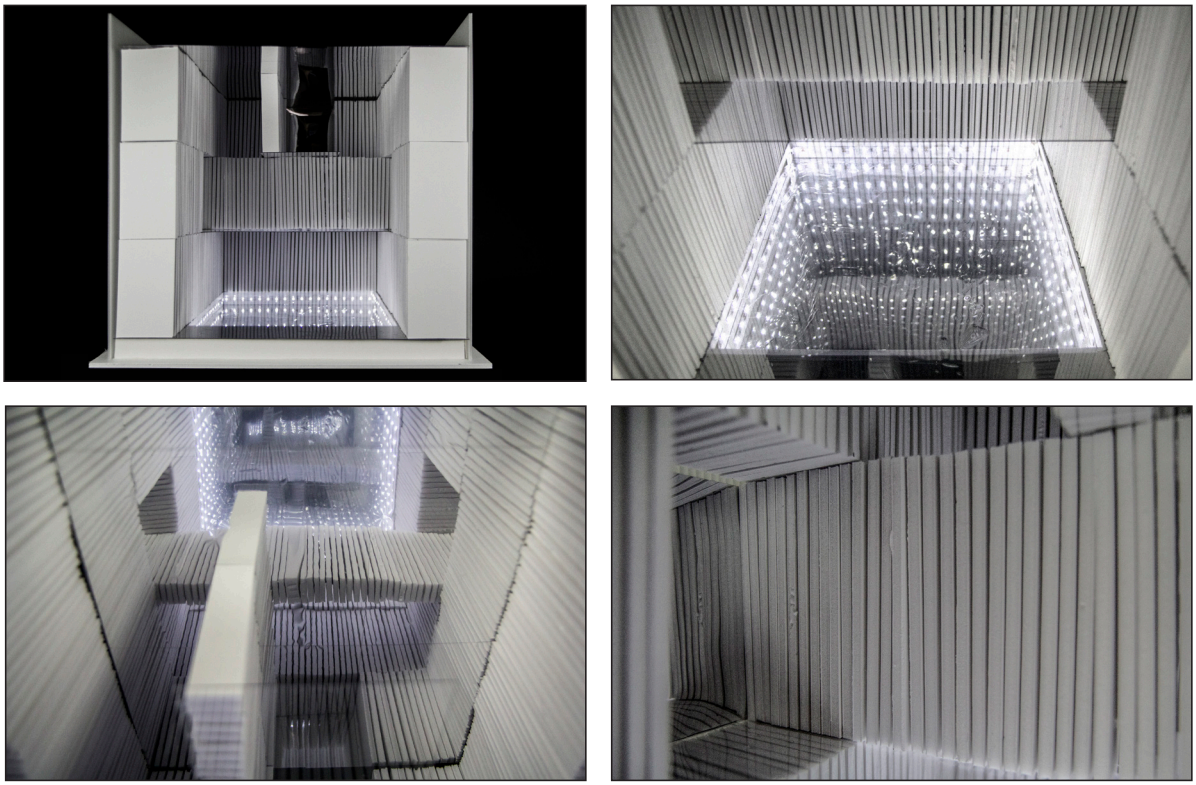
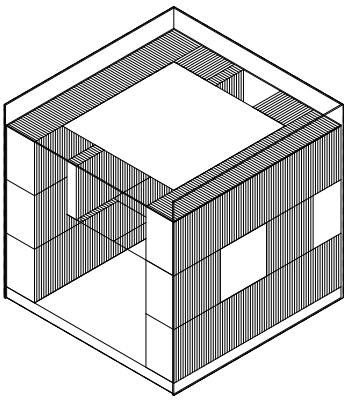


Fig. 8. The box illusion of infinity and floating (Made and photoed by author)

Axon of Device



Axonometric Split of Device

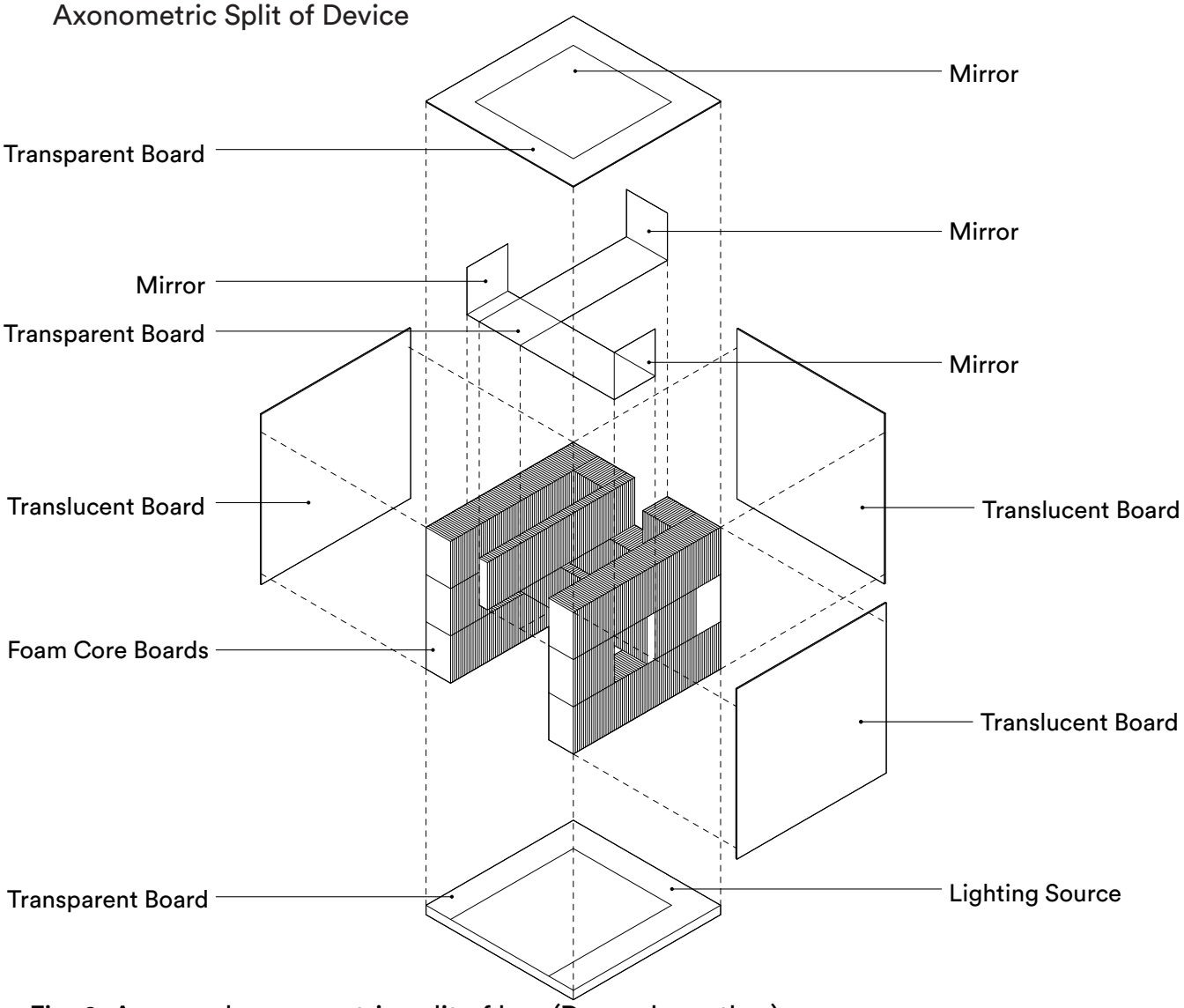


Fig. 9. Axon and axonometric split of box (Drawn by author)

Based on the idea of infinity, it actually creates the totally new ecology of library. Considering to deal with tremendous number of books, the possible operating system must be at least smart automatic system. This schematic diagram shows the possible automatic books delivering system which automatically bringing new books to the library and take books to people (Fig. 10.). Detailly the red area has more connection with visitors, while the blue part of the system has less.

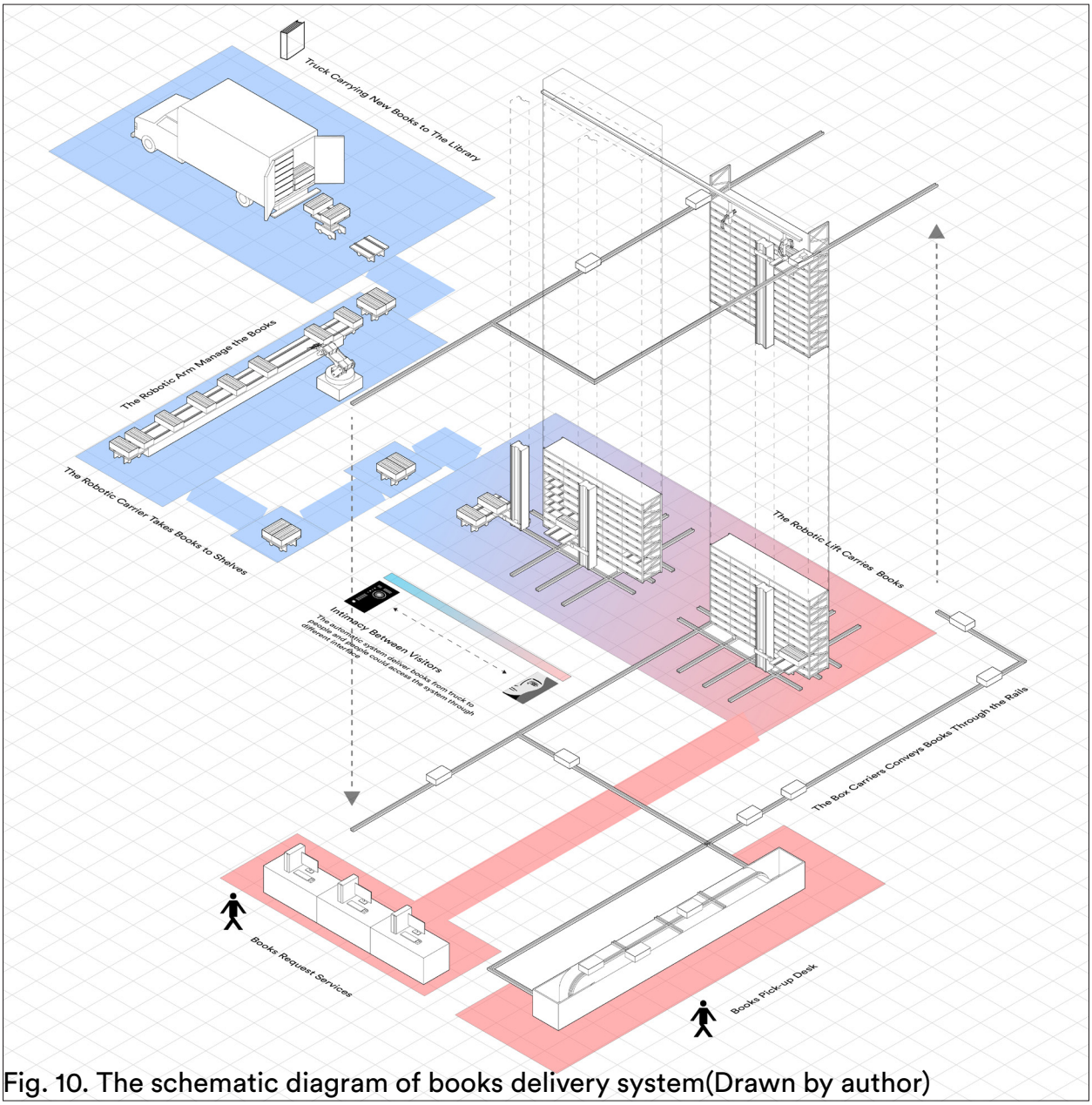


Fig. 10. The schematic diagram of books delivery system(Drawn by author)

2.3 The Library of Illusions

Combining the ideas of infinity, density, and floating, the design of the library is based on the background of the near future. Since the tendency of the digitalization is becoming obvious, and the library for the print books would be going to two ways in the future. The one would be the backup of the information, and another would become the monumentality for people to recall.

Thus, in the future, when people did not read print books anymore, there should be libraries containing paper books for the whole of humanity. The design of the library is based on this idea.

The libraries would collect all the books of single prints in the world. It sets up for back up and memorial (Fig. 11.). Thus, the books inside would not take out by people, however, they could read the books inside the building. Since the hotels are inside the building, people could go there to read the paper books, have a rest, have holidays and participate an academic conferences. It would be a great place to settle down and take the time to read printing books. In addition, the design is adaptively growing because of the increasing numbers of books. And all the archives located in the center are automatically managed by computers and robots to convey and serve.

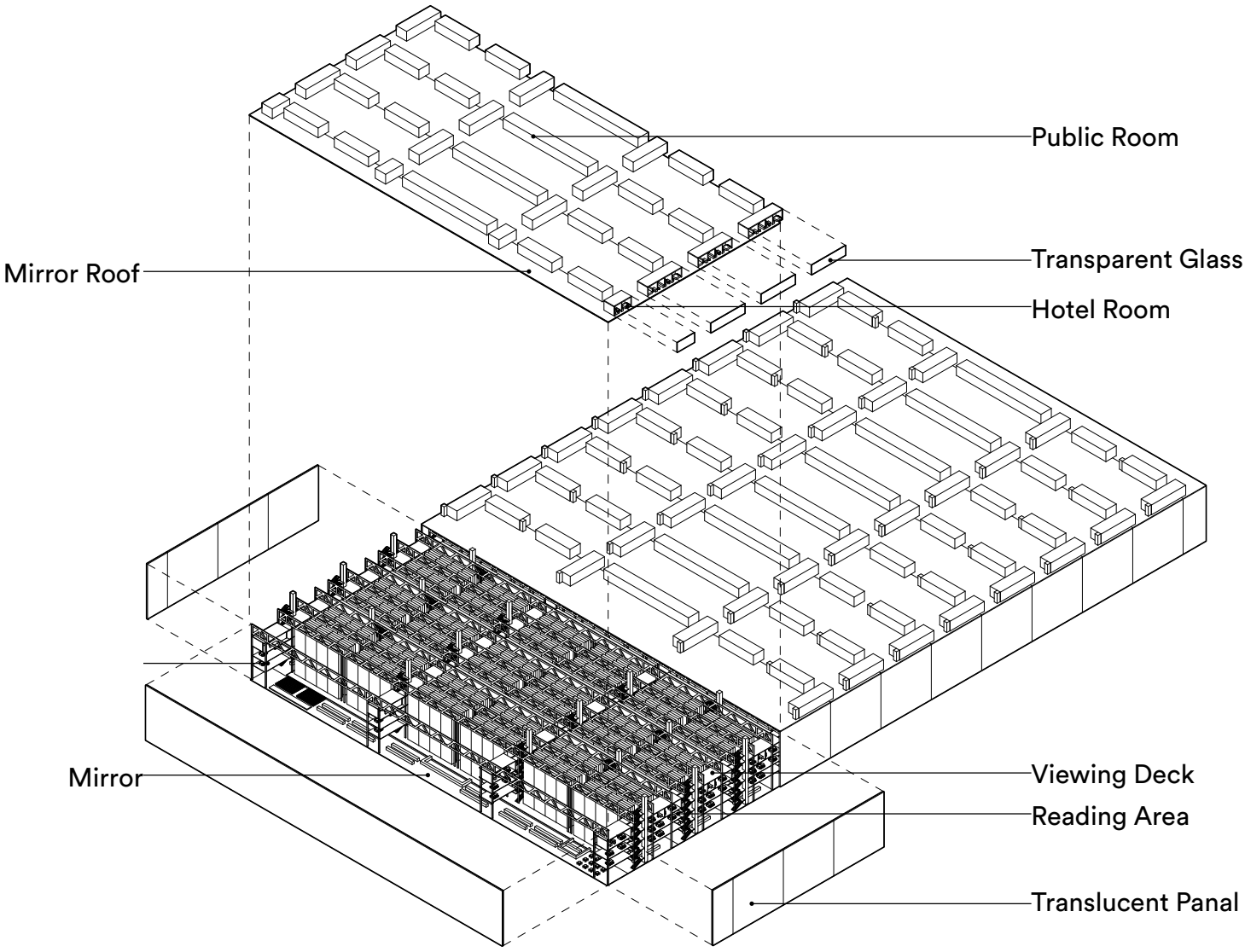


Fig. 11. Axonometric split of library (Drawn by author)

3. The Lifestyle

The prototype of the modular residential system is derived from the farming installation. Simply, the design is attaching the farming installation to the wall of the residential units to create a new style of life (Fig. 12.). People may not leave from their apartment to get food, and instead, they could farm at home to get their own food. Thus, the farm installation actually creates a new lifestyle for residents.

“In 2050, I’ll be in my 70s,” said Ryan Chaw, who leads technology acquisition for the APAC R&D team at Coca Cola. “I’ll be at home, wearing a belt that can measure my gut health. I’ll walk into my indoor vegetable garden, blend my own shake and consume it.”[4]

Consider the development of building technology and the increasing demand for higher living standard among citizens in current society, the type and shape of the building might be shifted dramatically in the future, people might spend more time and money for a better quality of life. Food is always necessary for human, and we have spent thousands of years to cultivate or raise different kinds of food. Nowadays, people are losing the sight of that procedure of food production and only take the final step directly – eat them all – due to the faster pace of life.

We believe that producing food at home is not only for surviving or good tasting but a new lifestyle that let people get involved with nature every day and interact with neighbors by exchanging productions daily (Fig. 13.). Everyone will be part of the environment and be proud of being a farmer.

4. "2050 China Food Tech Summit: Key Trends," JWT Intelligence, October 03, 2018, Accessed May 15, 2019, https://www.jwtintelligence.com/2018/10/2050-china-food-tech-summit-key-trends/.

Course: Antifragile Housing_Food Production
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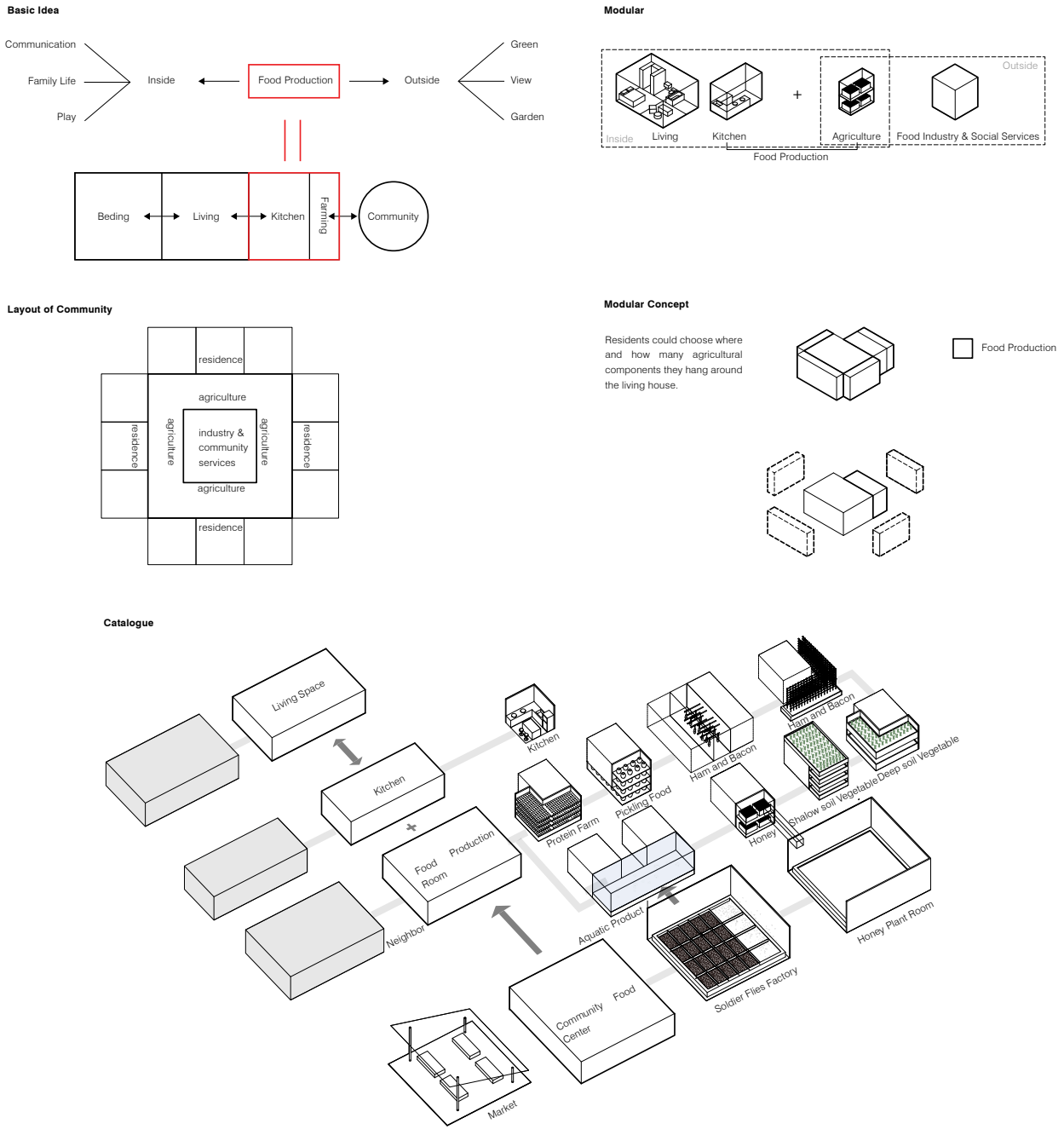


Fig. 12. Diagram of modular system & food production system (Drawn by author)

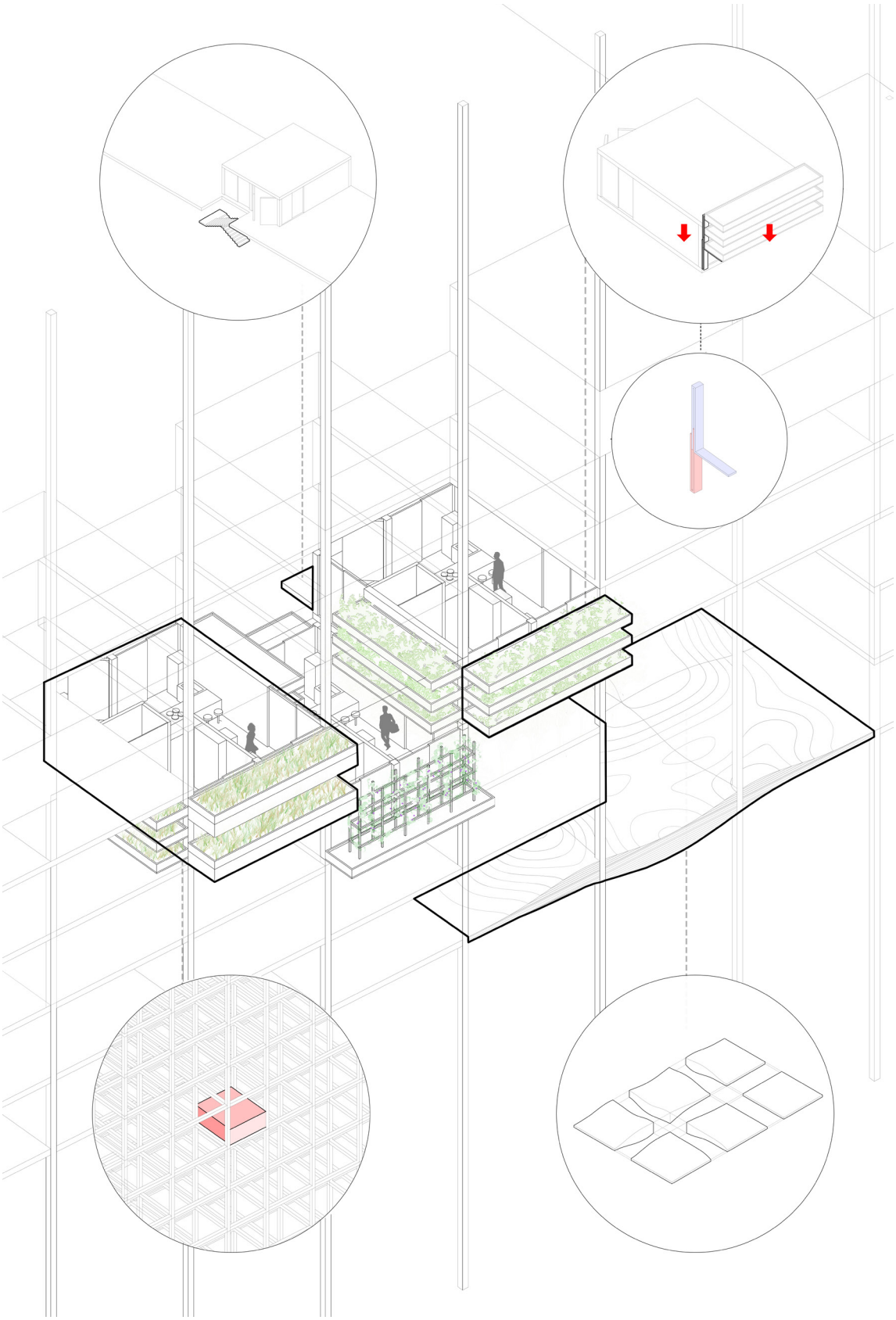


Fig. 13. Diagram of life details (Drawn by author)

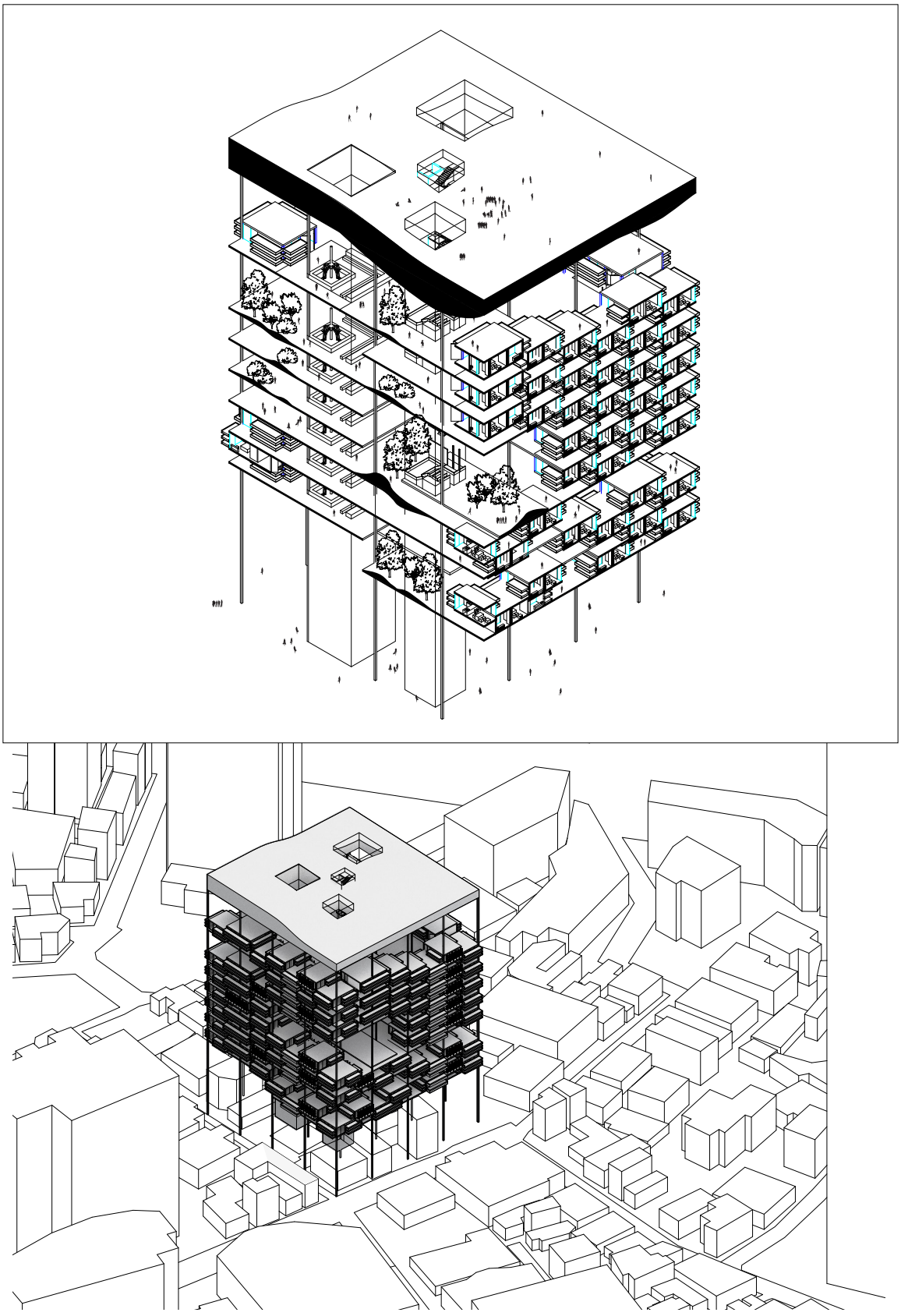


Fig. 14. Drawing of overall lifestyle (Drawn by author)

4. The Adjustor

Today's architecture is hard to define the boundaries of the architecture and the installation.[5] Some time art installation is not just art but also is a way of architecture. The installation could have some characteristics of architecture, and in my opinion, installation designing actually inspire and seek the possible unknown future of architecture.

This project is seeking a new way of architectural research and fabrication to design a new installation, and this kind of installation has characters of architecture and potential for the development of architectural design in the future. What we created here is actually an adjustor of the site area, which the relatively small scale installation could potentially affect the climate and ecology of the whole area.

4.1 The Natural Model

Unlike conventional architectural design analyzing site first, we chose the natural model first to do architectural research. Our natural model is termed as "Euplectella aspergillum," and usually called the glass sponge. We found out the hierarchical structuring of the glass sponge. This particular structure is so strong that could resist and filtrate the water wave effectively and it also provides shelter and food to small creatures (Fig. 15.).[6] This property of glass sponge has the potential to transfer to architecture. Utilizing the finding capacities and properties of the natural model guide throughout our architectural design and exploring.

5. Jane Rendell, "Art and Architecture a Place between," 30-42.
6. James C. Weaver et al., "Hierarchical Assembly of the Siliceous Skeletal Lattice of the Hexactinellid Sponge Euplectella Aspergillum, " Journal of Structural Biology 158, no. 1 (2007): 93-106.

Course: Optional Studio_Human-centered Adaptive Architecture in UAE
Spring 2019
Instructor: Jenny Sabin
Team: Guoyu Wang

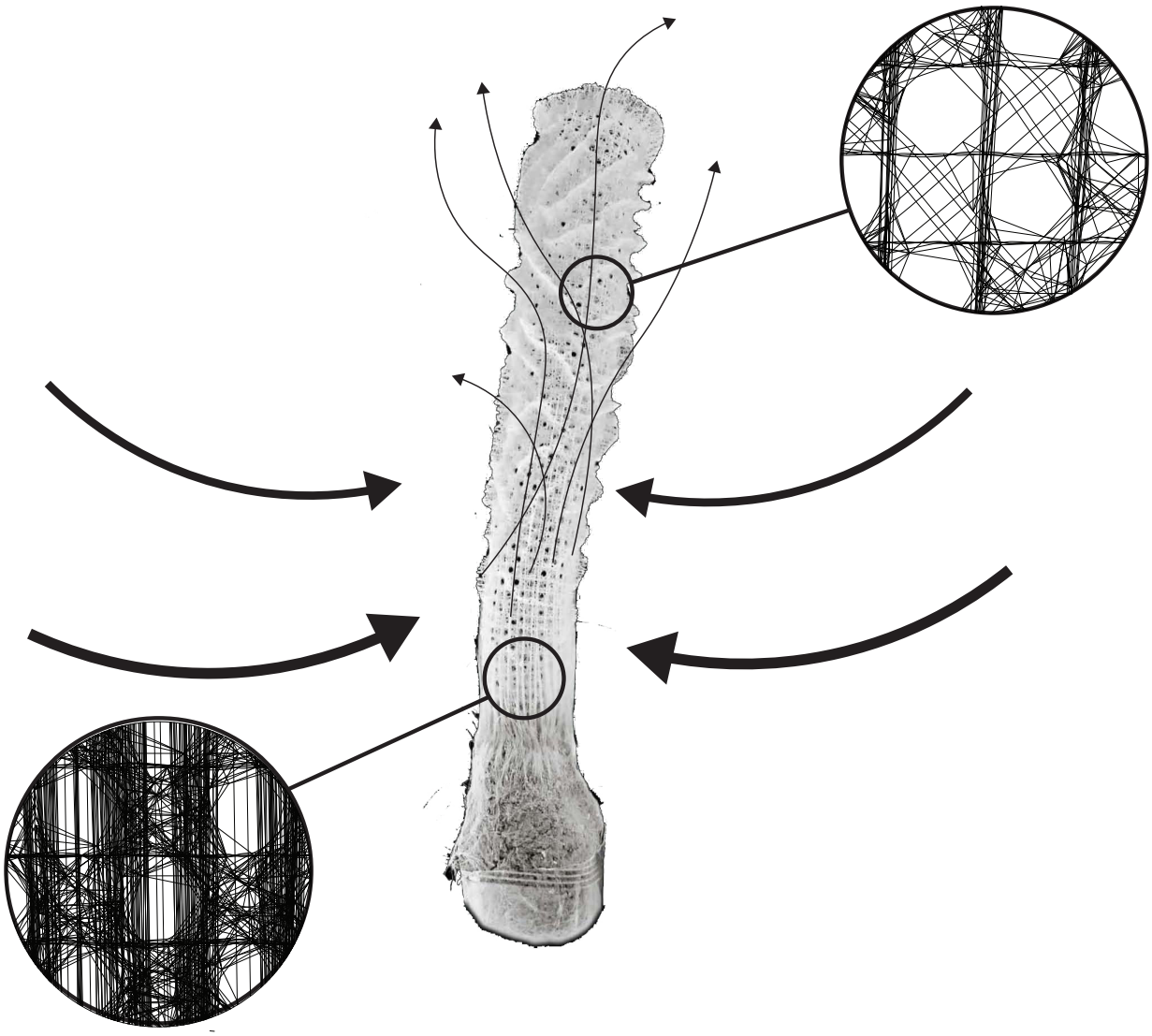


Fig. 15. The capacity of glass sponge (Drawn by author)

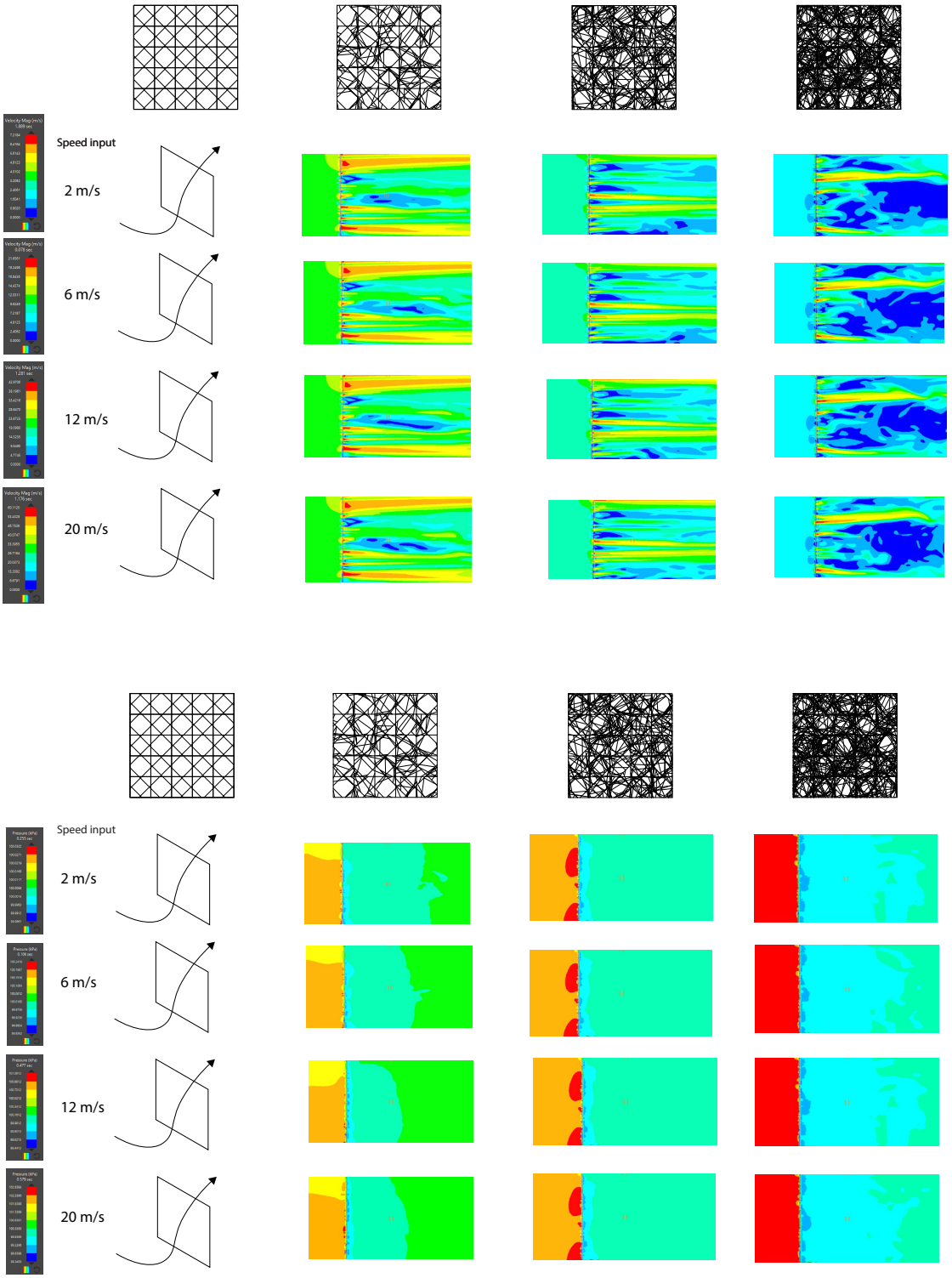
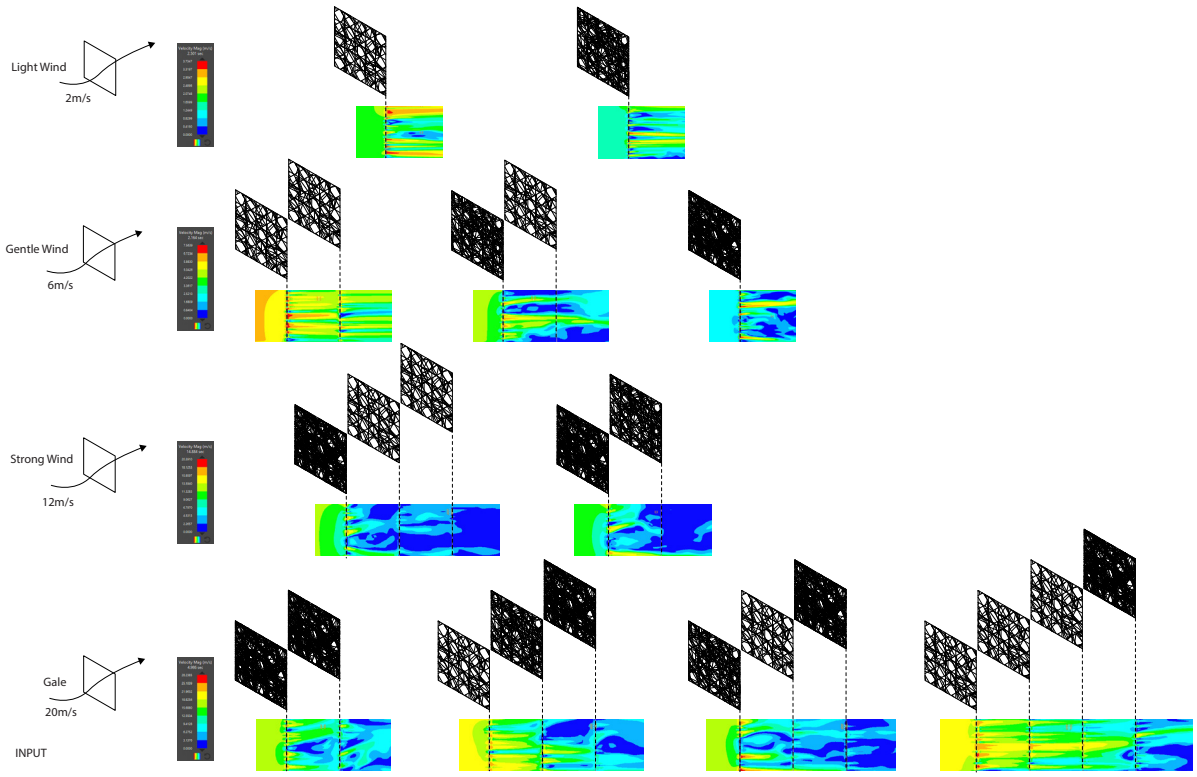


Fig. 16. Wind speed and pressure test through a single interface (Drawn by author)



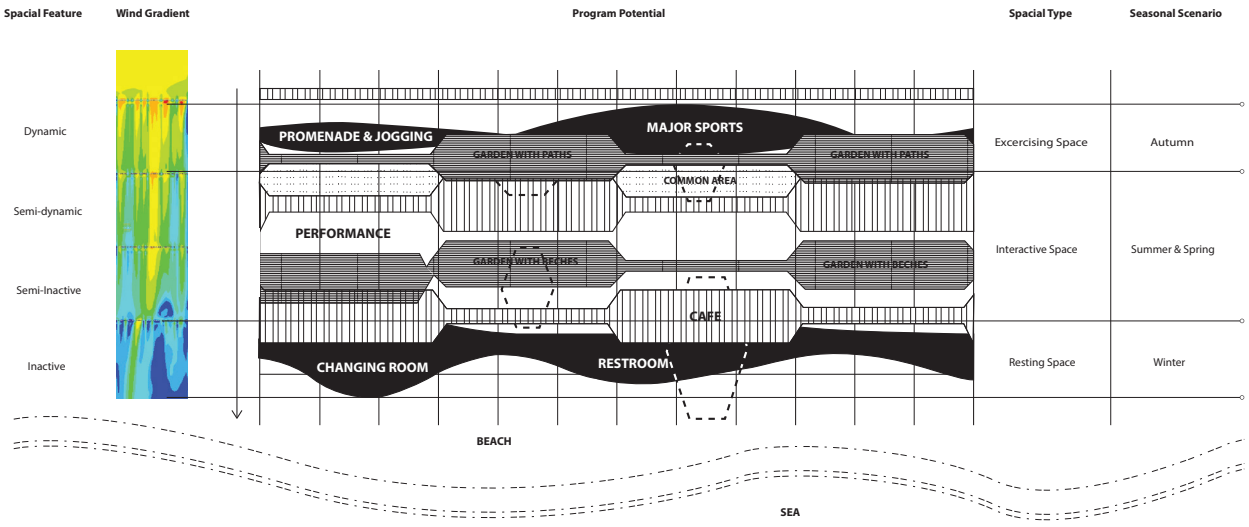


Fig. 17. Wind speed and pressure test through multiple interfaces (Drawn by author)

Fig. 18. Plan drawing (Drawn by author)

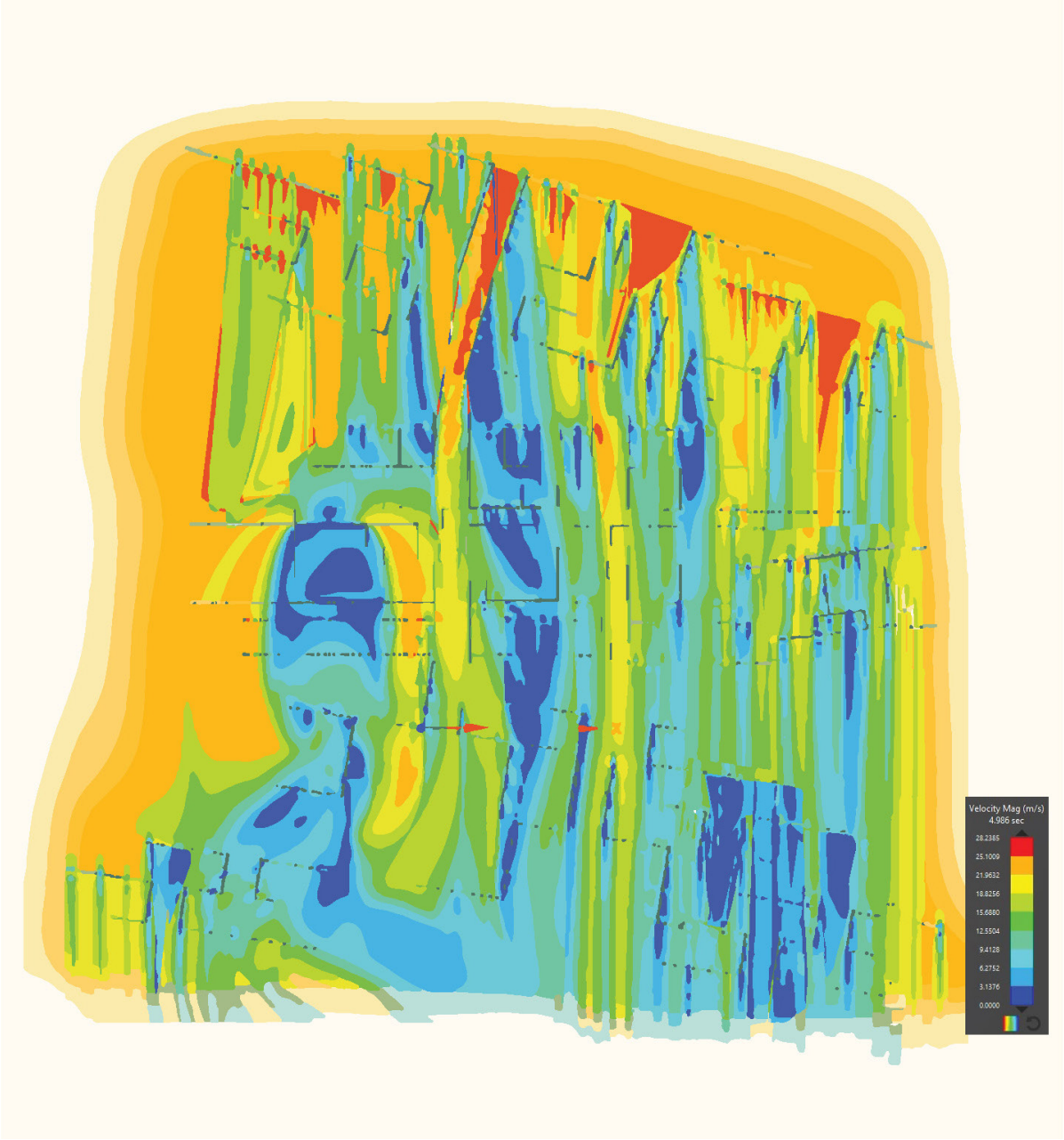


Fig. 19. Wind simulation based on the plan (Drawn by author)

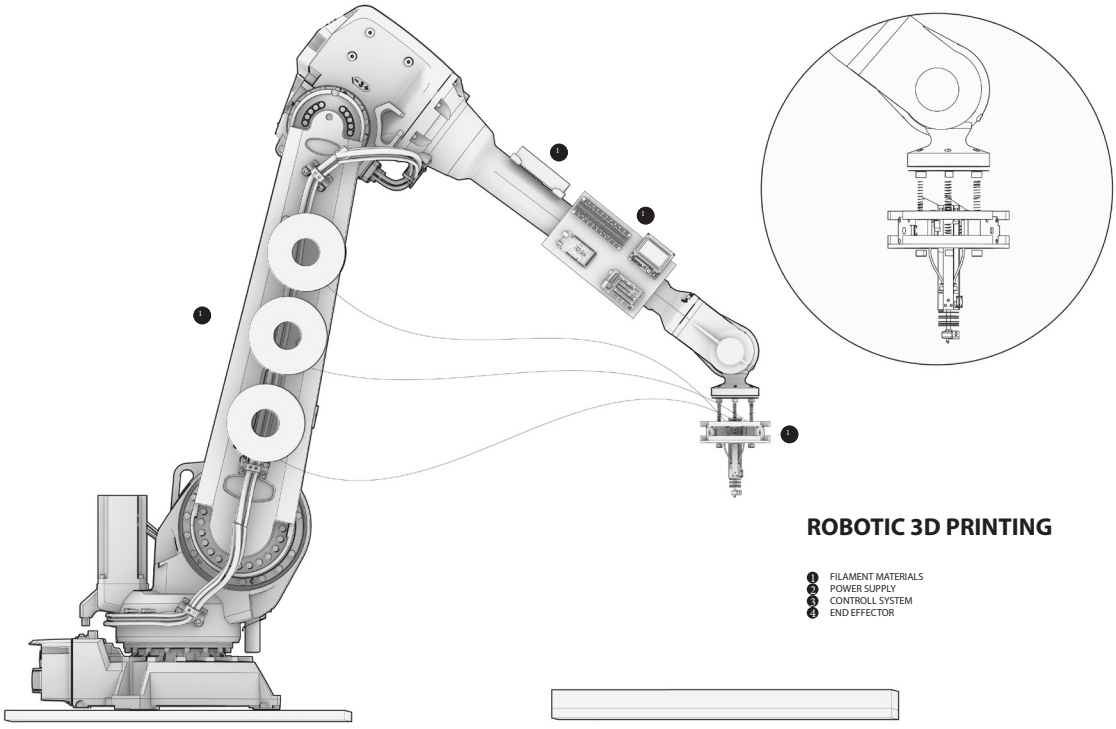
4.2 The Interface and Wind Analysis

Thinking about the pattern of the natural model has strong strength to resist and filtrate the water force, when changing the water environment to land, the hierarchical structure has similarity to resist and filtrate the wind. After we did experiments of wind and the interfaces, the structuring interfaces could change the thermal zone of the environment (Fig. 16.). The diagram of wind simulation shows how the wind filtrated by the interface (Fig. 17.). When the wind passes through a single low density of interface the wind speed increased, while when the wind passes through a single mid and high density of interface the wind speed decreased.

4.3 The Fabrication and Architectural Design

And then we tried to fabricate the walls of interfaces to prove that our design could come true. Specifically, we designed an end effector to 3D print one unit of the interface (Fig. 20.).

Based on the test, we utilized our design of installation to put an impact on our site, which could significantly adjust the ecology of the area. We actually adjust the wind speed to influence the environment and ecology according to activities. It means the design of the combination of interfaces creates different wind zone, and it simultaneously impacts the possible people's reaction and activities there (Fig. 21.). So, the design of installation becomes an adjustor for the local ecology and environment to benefit the region (Fig. 22.) .



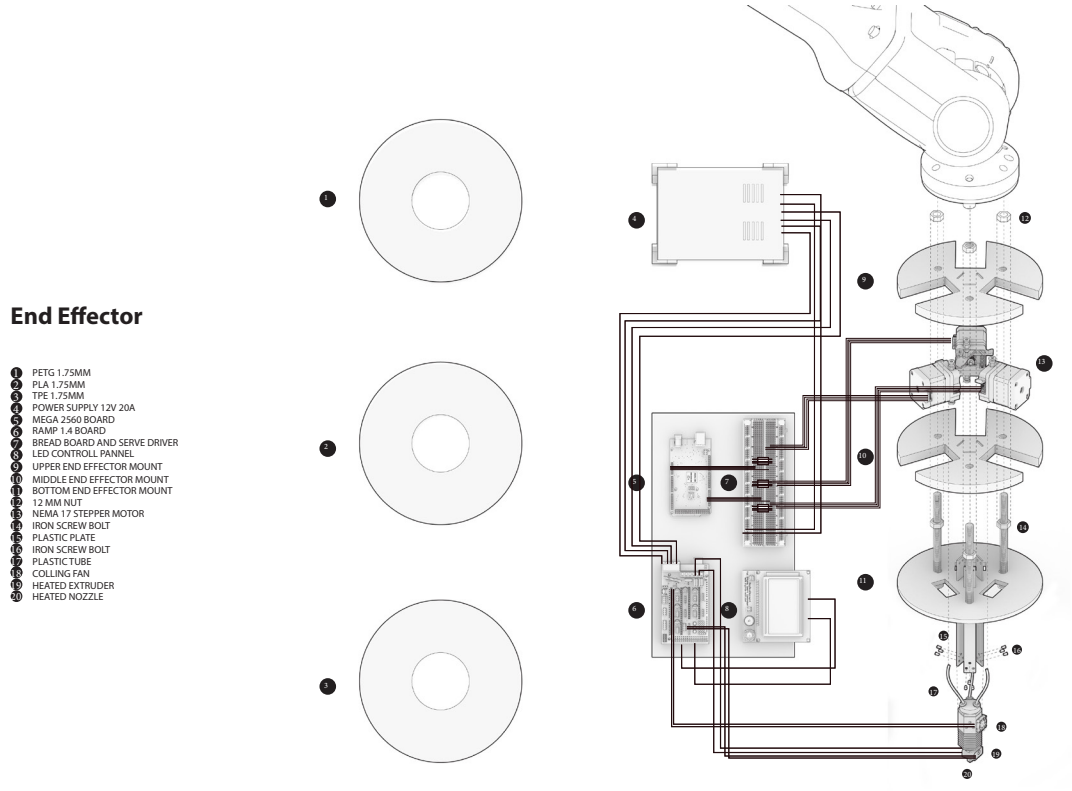


Fig. 20. Schematic diagram of self-made end effector (Drawn by author)

Fig. 21. Rendering of interactive views (Drawn by author)

Fig. 22. Rendering of interactive views (Drawn by author)

Conclusion

Throughout all the projects, the architectural designs are based on the studying and research of installations. What I want to show is how the installation actually lead to the approach of architectural design. The first project is about doing the research and treats the installation as the stages for the design. The second is about testing the art devices and then applying the artful illusions to guide the architectural design. The third project is adding installations to a modular design to create a new ecology of the community. The last one is adjusting the climate of the area by putting an installation and explore the potential architectural value of the design. Overall, studying the installation could be another approach to achieve the architectural design.

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