



2D SHAPES TO 3D FORMS  
FUNCTIONALITY & CIRCULATION

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DREXEL GRADUATE THESIS  
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The background features several large, overlapping organic shapes in shades of blue and pink. A large blue shape is on the right side, a smaller blue circle is in the upper right, and a large pink shape is in the center. A large blue shape is also at the bottom left.

01

# INTRODUCTION

THE THESIS

# THESIS

The thesis project explores how the elementary shapes and forms cooperate and translate the design functionality and circulation within multiple dimensions. The transition between graphic 2 dimensional and extruded 3 dimensional spatial elements create a complex yet minimal interior architecture which accommodates a diverse range of programmatic functions.

02

# PROGRAM

THE PROJECT

## STOW

- Celebrates and nurtures Vermont's creative communities by curating a rotating selection of contemporary local artisans and brands including pottery, sculpture, painting, jewelry, wearable art, and photography.
- The marketplace and cafe feature a wide range of local products including produce specialty foods, artisanal cheese, microbrews, ciders, wine and chocolates.
- Provides an Interactive High-end design marketplace which facilitates meaningful exchange between visiting tourists and local community.
- The design finds inspiration from the local natural environment and translates this into a contemporary minimal aesthetic which highlights the distinct beauty of Vermont while also showcasing the diverse array of local goods from the surrounding areas.



03

LITERATURE  
REVIEW



## Furniture, Space and Human Activities

### History

Human activities and furniture depict different movements of human bodies in each piece of furniture. Besides, the space between each piece of furniture indicates the drawing of how people move from one piece of furniture to the next. However, the concept of furniture first developed as early as 3100-2500 B.C. The first items created for household use were made of stone, as wood was not readily available during the Neolithic time period. Dressers, cupboards and beds were amongst the first forms of furniture. If we trace back to permissive time, for example, Çatalhöyük in Turkey, 7100 BC to 5700 BC, which is one of the first “city” in human history. In Çatalhöyük, people’s houses were simply made in clay and stone, inside the room the simple decoration tells the different function of the space. Kitchen, living and sleeping space were setted and divided by different heights of clay base. And people provided themselves comfort with blankets and hayricks. And this traditional way of living continues nowadays in some countries, for example Japan and South Korean. In their traditional houses, people sit on the floor with cushions and sleep on simple tatami or sleep mats. The way of living can be just simple and comfortable.

### Relationship

Furniture is defined as movable equipment that is created to make a person’s office or home more suitable and comfortable for living or working. Furniture can be used for storage, seating or sleeping. It is a term used to describe movable objects meant to support human activities, such as a chair, furniture is also used to hold objects at convenient places of work, such as tables. This functionalism views furniture as, in effect an extension of the human ability to complete physical tasks. But this also makes the furniture in the space define how people will act. A table is where you eat, a sofa is where you sit, a fixing of a posture of the body in a furniture initiates a whole series of consequences. However, is it a good thing that ourselves should be defined how we act by furniture, or the space should have potential to be more free. Japanese Architects and artists Arakawa and Gin believe that the space should give people the possibility to discover the potential of their body and experience environments that they may feel at different times.



Figure 1: Çatalhöyük

## The space without Furniture

### About Furniture Free Living

The idea of furniture free living style may appear ridiculous. Furniture, free-living offers more space. It enables individuals to enjoy the spaciousness of distraction and to focus on things loved. In addition, The idea of furniture free living style may appear ridiculous. Furniture, free-living offers more space. It enables individuals to enjoy the spaciousness of distraction and to focus on things loved. In addition, furniture free Lifestyle is about living your life free of the burden and clutter of most modern furniture. In today's world we have designated rooms for designated furniture that are for designated activities. Rather than furniture being a tool or a simple part of your life – it starts to shape your life and how you live. People cram it in their living spaces regardless of whether or not there is space.

You think you need it. You are supposed to have it. Right?

Not Necessarily.

Furniture-free living allows you a lot more space. With that space you move more. You have less clutter – no more keeping things just for the sake of having them.

### Physical Benefits

There are several physical benefits of furniture free living. First, it enables individuals to get more movement and exercise more

efficiently. While people spend time to sit, furniture free living provides a chance to movement and exercise at home. It makes the living room to be furniture free which allows for more movement and easy exercise. Furniture free-living also improves energy. There are instances where furniture with the wrong size, height, or color can have a huge impact on energy. Therefore, to improve energy, a room with a furniture free living offers the best option to enhance energy. However, it is important to choose the right furniture that can be good to furnish the room with a furniture free idea.

The furniture was first designed for functional needs, and later they were designed with character for physical well being of the human body. The research of Yorsa El Harairy, who is a master in Damietta University shows that it is actually not beneficial for people stacking in furniture even if the piece is designed in the human physiology way. “We sit to work.,We sit to eat.,We sit to relax. We sit and sit and it's killing us.”(Konie)

In fact, furniture free living has a lot of benefits for our health. When you take away the chairs and couches you force your body to find different ways to engage and relax. Getting rid of your furniture helps you move more, exercise more, and use your body more. It's a more natural way to use your body and get more exercise.

Furniture living also makes good posture easy. Most chairs and couches are not conducive to sitting correctly. Being rid of your furniture allows you to take positions that can help your posture, lessen back pain, and help your body be in the alignment it was meant to be. Plus, when you don't outsource your core support to the back of a chair or comfy couch cushion, your core gets an easy but effective workout.

### Environment Benefits

The idea of environment-friendly furniture has been around for a very long time. It creates an atmosphere where several home products are built to maximize efficiency as well as profits. Besides, there are no unnecessary toxins, which are added to the materials. Individuals can easily confirm with each product to shop by asking the manufacturer or refer to the label. In addition, furniture free living provides an opportunity to build furniture without harsh chemicals. The eco-friendly brands typically make use of 100% natural woods. The solid woods provide better quality, which is more durable when compared to the harmful chemicals, such as formaldehyde. The eco-friendly furniture uses clear coats, paints as well as glues that have low or zero-VOC. Furniture free-loving is also manufactured using sustainable resources, which is better for the environment. Therefore, to be sustainable, solid wood should be from FSC and SFI certified sources. Some products use reclaimed wood or discarded lumber, hence minimize waste, which means that the longer the life span of material for any product used, the better the environment.

Presently, the architectural and design trends have implemented a specific orientation about sustainability, care, and preservation of the environment. However, the main concern about environmental issues has led manufacturers to develop furniture that does not create a threat to the environment. The main objective of implementing sustainability in furniture is to achieve the optimal results which generate a benefit to the environment.

Furniture manufacturing processes can generate high levels of waste, and furniture waste is mainly composed of wood and upholstery foam, both of these has a high calorific value. Also, multiple kinds of other wastes are created during the furniture industry, this includes production and overproduction, assembling, finishing, transport, inventory, etc. The research shows that most of the furniture manufacturers or refinishers generate hazardous waste, which some of them are known to be harmful to human health and the environment when not managed properly. So, furniture free will help on this, it will save on not only your physical health, but also the environment.

## Aesthetics, Minimalism and Precedent

### Minimalism

Minimalism emerged as an important American art movement in 1960s New York, as its name suggests, means using limited material to create a desired effect. A direct reaction against Abstract Expressionism, Minimalist artists set aside ornate symbolism and focused on materials. And it is a movement specific to geometric representations, it extends in the modern day far outside this relatively narrow constraint. The artists often worked with industrial materials like concrete and steel, calling attention to their forms and physical properties rather than focusing on emotion. Instead, Minimalist artists often forced viewers to contemplate how the physical objects influenced their reactions by reflecting on principles like weight, light, and height. Minimalist architecture finds its roots not only in Japanese culture, but also the De Stijl and Bauhaus movements of the 1920s. De Stijl's use of abstraction and simplicity combined with Bauhaus' interest in using industrial materials and reducing forms are essential characteristics of Minimalist architecture.

“Make it pure and simple” – this brief sentence could have served as the motto for Minimalism, with Minimalism, the former gestural qualities and illusionism of art were no longer critical. By condensing design to its essential elements and focusing on form, light, space, and materials, Minimalist architecture achieves harmony through simplicity.

The emphasis was supposed to be on shape and materials, and these were to be as pure, plain and simple as possible. Motivated by minimalism, furniture free has the possibility to achieve a simple design, which influences our way of life. Would it be much more pleasing, but also far less expensive in both time, effort and environment if simplicity could be part of the plan.



Figure 2: Wall-Less House, Nagano, Japan

## Precedent design

The structure itself shapes the space, and the structure has the power to be functional.

The House NA in Japan Associated with the concept of living within a tree, The loosely defined program and the individual floor plates create a setting for a range of activities that can take place at different scales. The floor plates in a furniture-like scale allows the structure to serve many types of functions, such as providing for circulation, seating and working spaces. The experience in this space is about architecture, structure and the body, and is equally between simple and aesthetic.

Compared to the similar project, the reversible destiny in Japan by Arakawa & Gins is another successful architectural interior project which uses geometric forms to achieve the different functions within the space, While the reversible destiny uses candy-like pop colors to create an interesting interior.

Besides function and aesthetic, the structure can also achieve sustainability, The wooden cave lodging in Grace by Tenton architects, this project shaped the whole space with curved wood structure, providing the space for sleeping and seating flexibility. The wood creates this beautiful natural minima aesthetic, and at the same time, achieves materiality sustainably.



Figure 3: House NA, Japan



Figure 4: Reversible Destiny, Japan



Figure 5: Wooden Cave, Grace

## Conclusion

Furniture is defined as movable equipment that is created to make a person's office or home more suitable and comfortable for living or working. However at the same time, furniture also brings these physical and environmental problems. Maybe you cannot imagine life without furniture, but furniture free is a thing worth being practical. The simplicity behind this, which can be called as minimalism, can change the way of our life. And gives people more flexibility to experience the space of themselves, living their life free of the restriction and frame of most furniture. In conclusion, my thesis is about achieving a furniture free lifestyle, associated with the simplicity of minimalism, and in which the needed function, comfort and aesthetic can be accomplished by the structure and materials.

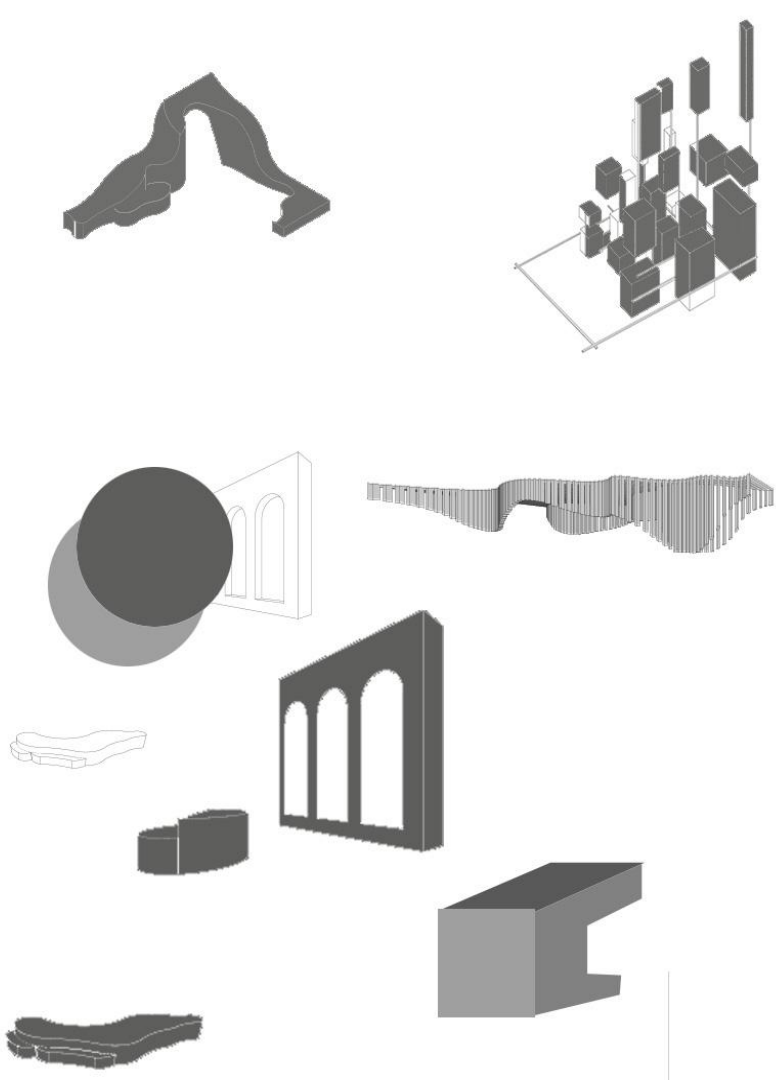
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04

# DESIGN AGENDA





01

To build functional structure within human scale that serves in the same way as furniture does.

02

To create an environment which presents a minimal aesthetic as well as incorporates the beautiful and diverse products from the local community.

03

To connect to the natural surroundings and apply to the sustainability.



# DESIGN PROB

05

SCALE  
FORMS  
AESTHETIC



The background features a light blue gradient on the left side, transitioning into a darker blue area on the right. Overlaid on this are several white, organic, blob-like shapes of varying sizes. The largest shape is a central oval containing the number '06'. To its right is a smaller circle, and further right is a larger, more complex shape. The text 'PRECEDENT' is positioned to the left of the central oval, and '06' is centered within it.

PRECEDENT

06

Precedent



Scribner's Lodge

Catskill



Precedent



Barin Ski Resort . Iran



Precedents



Precedent



Wooden Cave. Grace







07

# DESIGN APPROACH

## Aesthetic & Materials

Developed from Vermont local art, interpreted with a minimal contemporary aesthetic.

The use of local sustainable materials and artisan products.

## Natural Connection

Provide a diverse range of experiences and activities for visitors which enhance connection to nature.

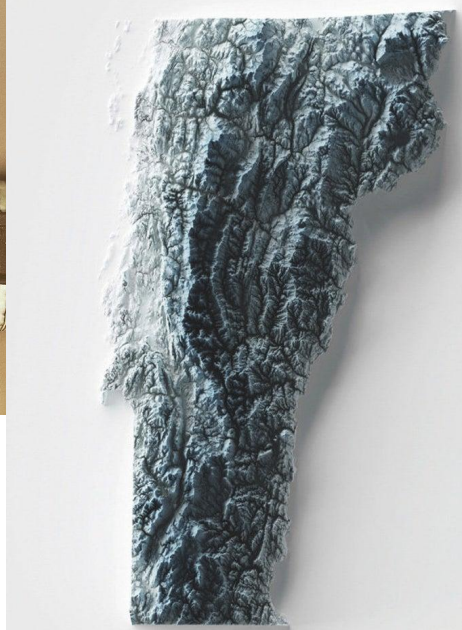
## Form & Scale

Explore the connection between forms and shapes, being interactive and functional.

# APPROACH

# ART

Aesthetic  
&  
Materials



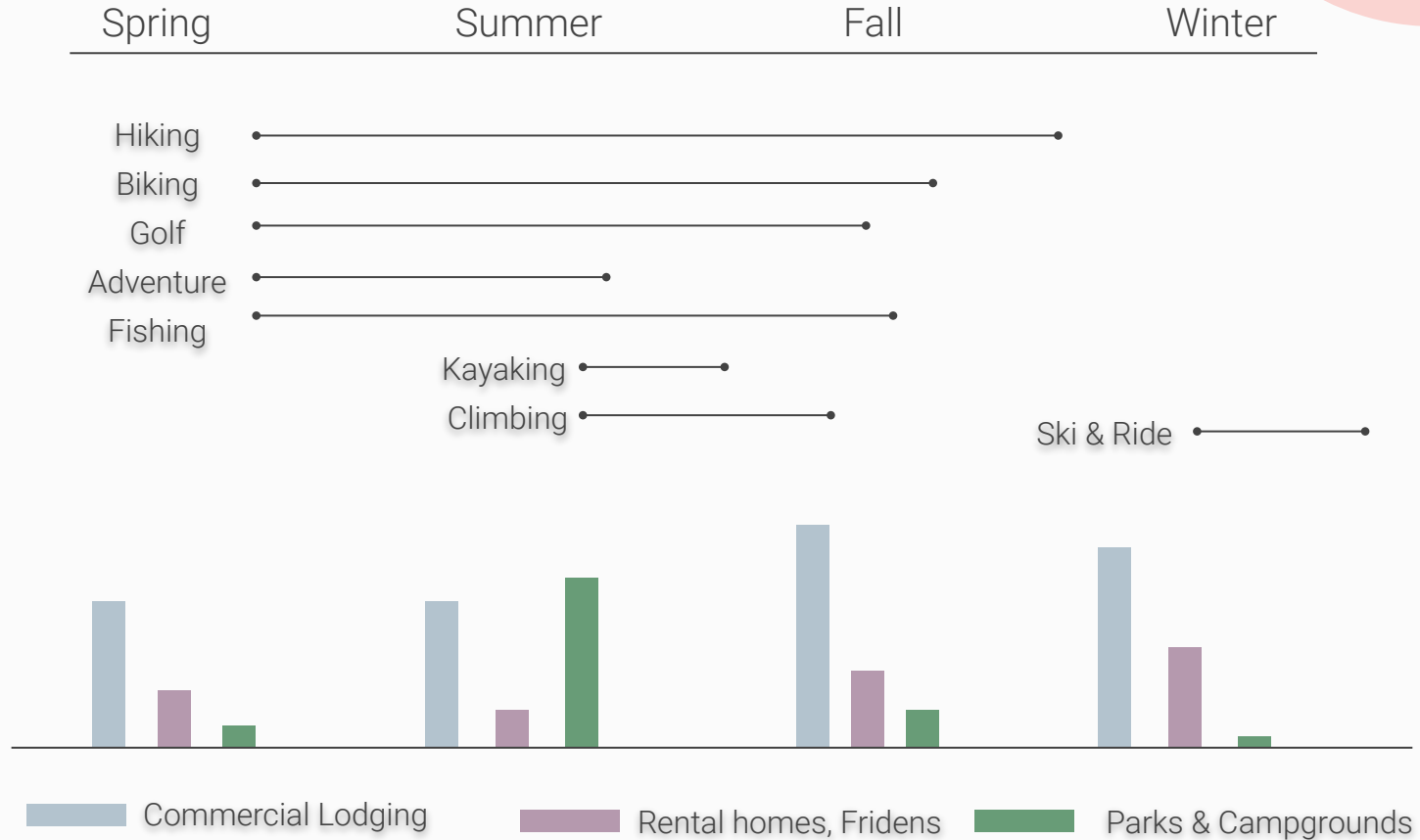


# INTERIOR

Aesthetic  
&  
Materials

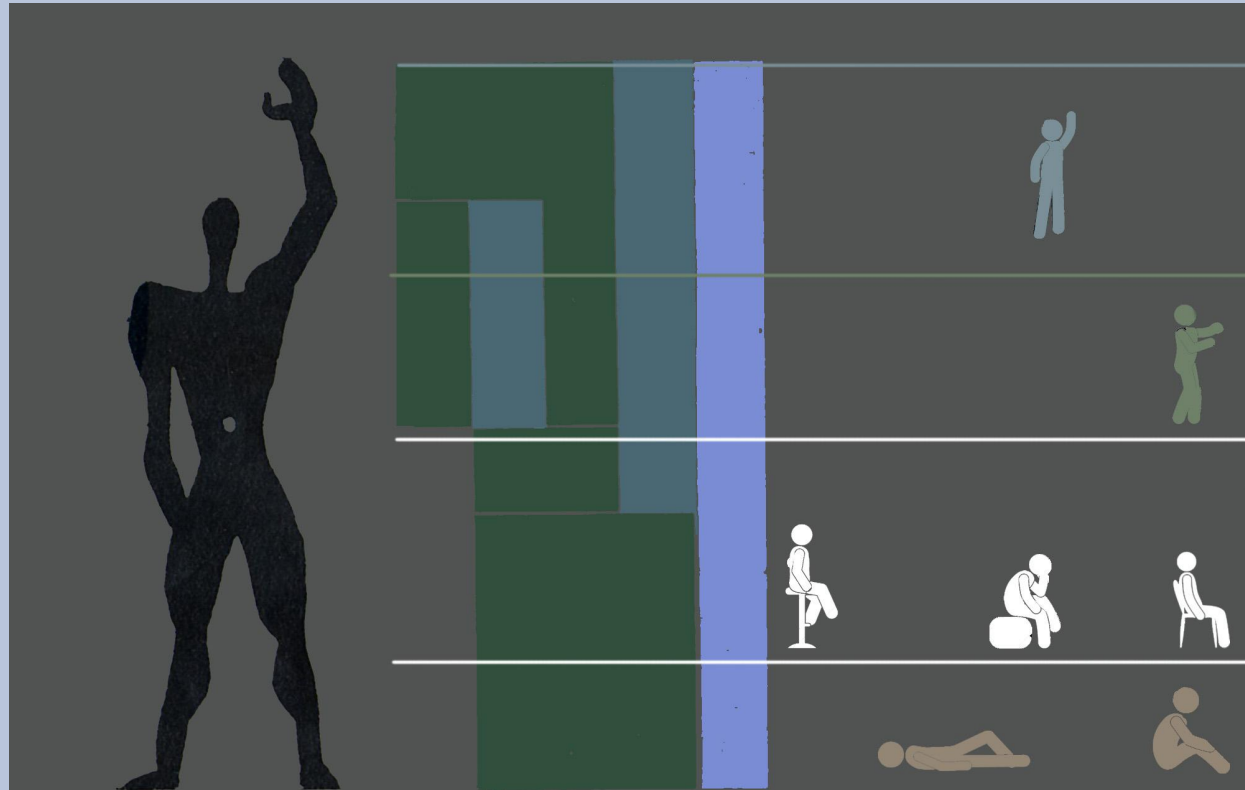
# ACTIVITY

Natural  
Connection



# SCALE

Form  
&  
Scale



08

# PROGRAM

STOW - A MARKETPLACE & CAFE



## RETAIL

8700 SQ.FT

01

02

## CAFE

2500 SQ.FT

## COURTYARD

2100 SQ.FT

03

04

## ESSENTIALS

OFFICE.	STORAGE.	SERVICE
500	600	950 SQ.FT

09

SITE

STOWE - VERMONT - TOPNOTCH RESORT

# SITE

4000 Mountain Rd. Stowe. VT

Topnotch Resort



# SITE

4000 Mountain Rd. Stowe, VT

Topnotch Resort



Villas

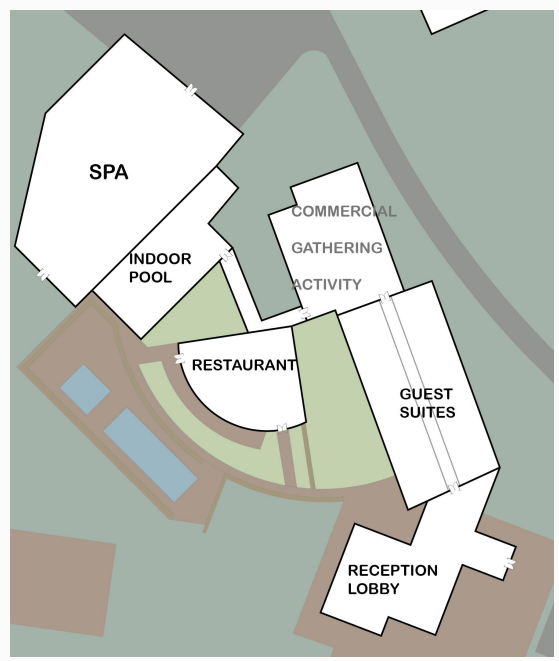
River

Parking for Spa & Restaurant

Guest suites building, 2 floors

Main entrance to the lobby

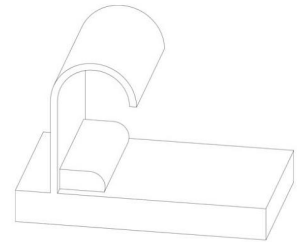
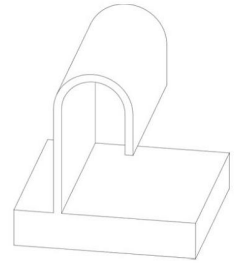
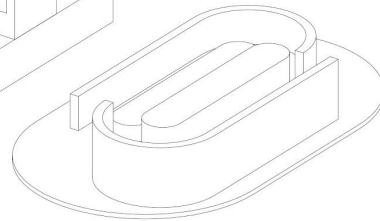
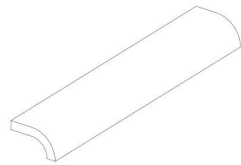
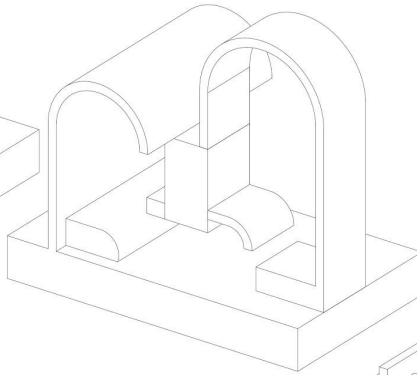
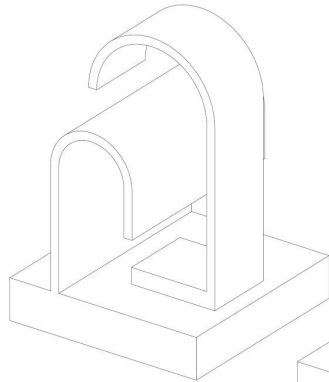
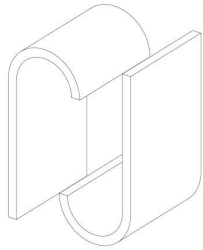
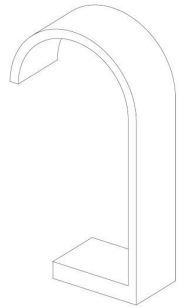
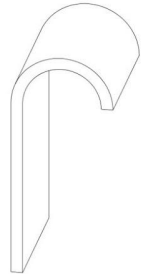
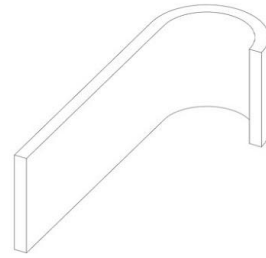
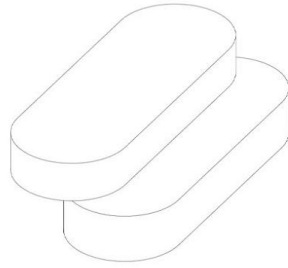
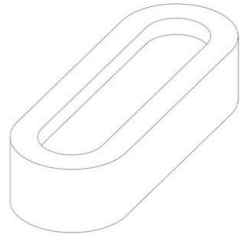
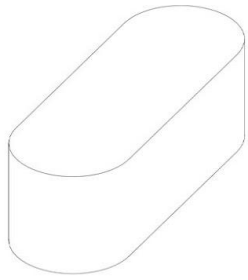
Main road & Main enter way

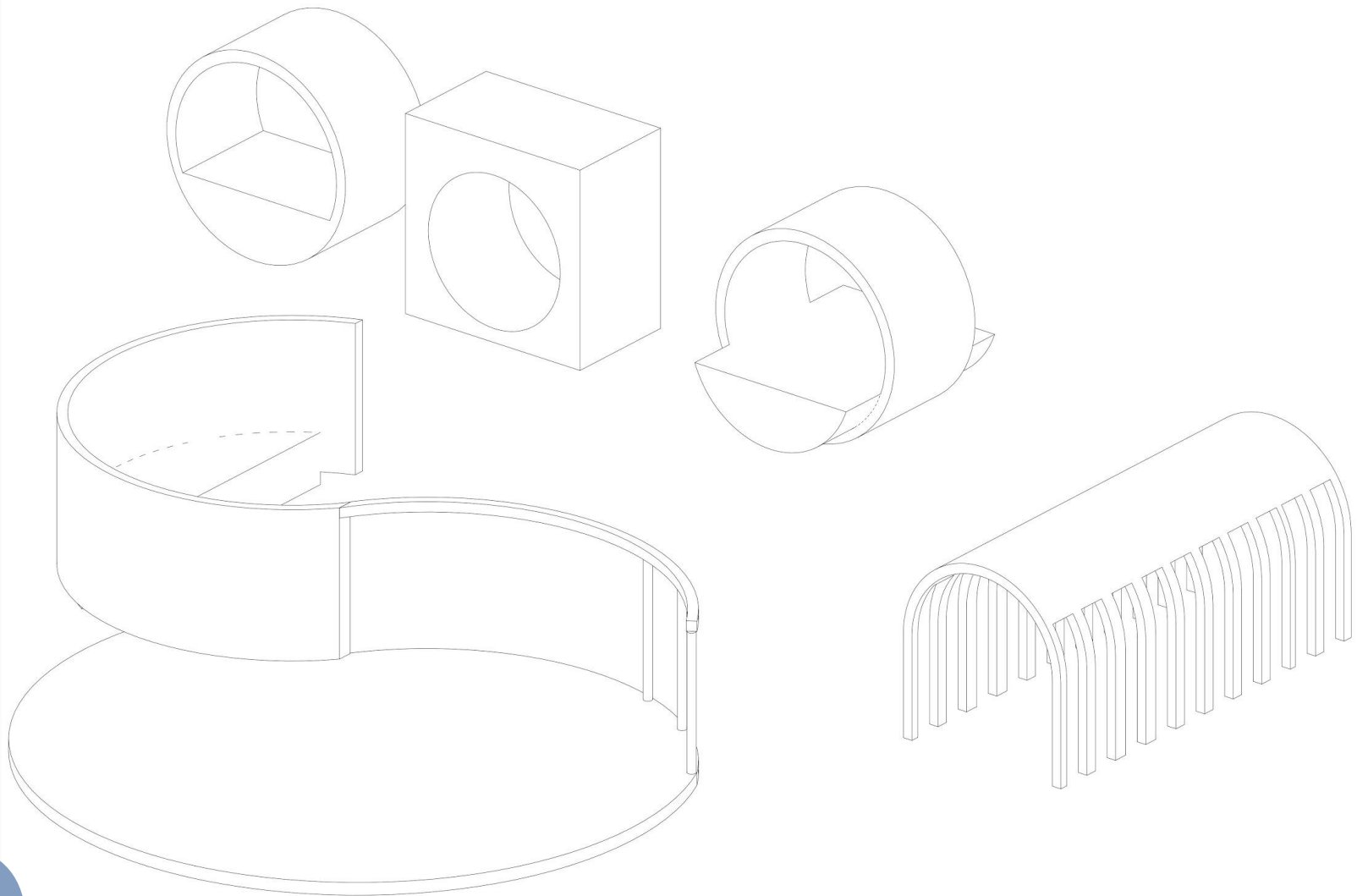




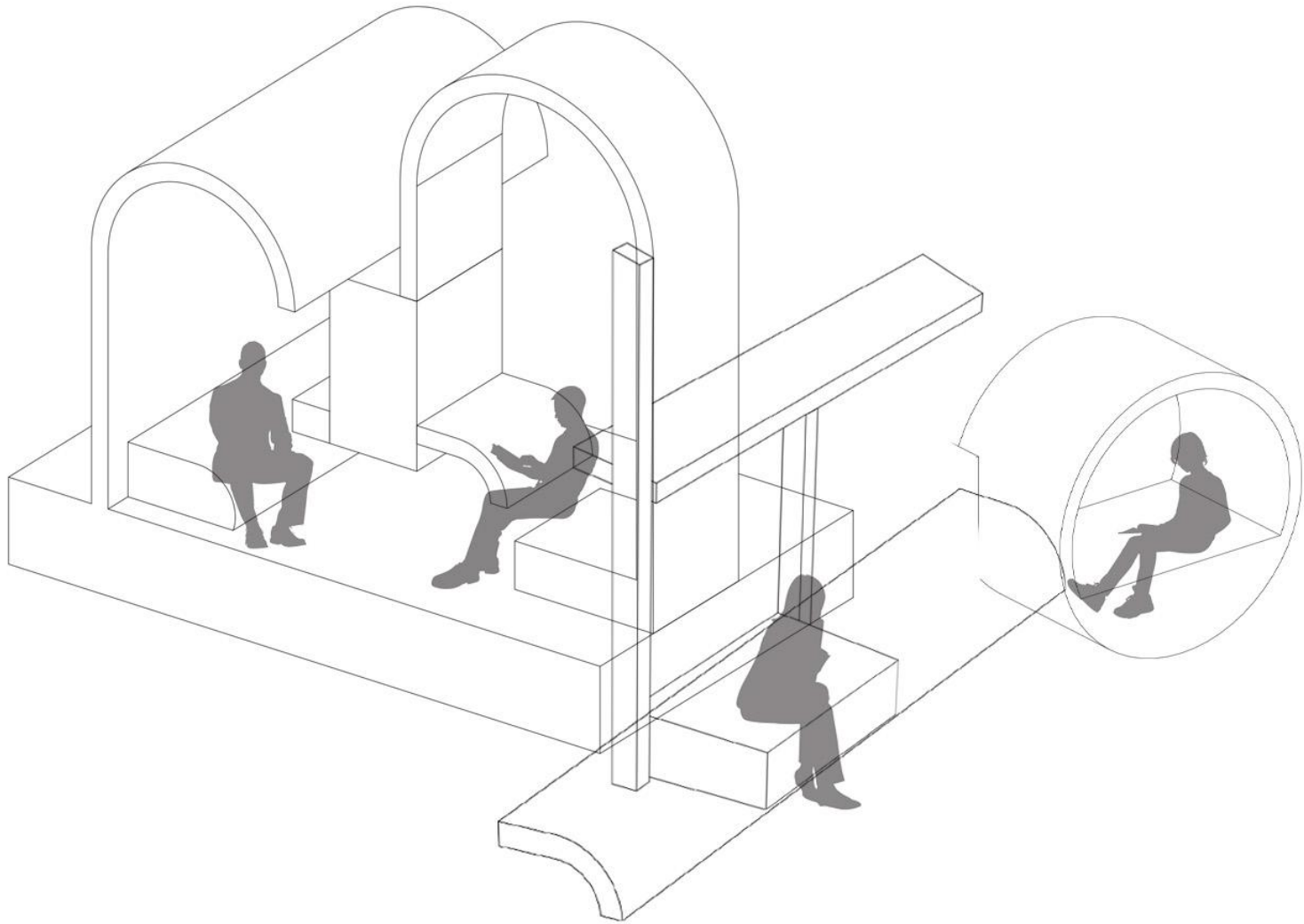
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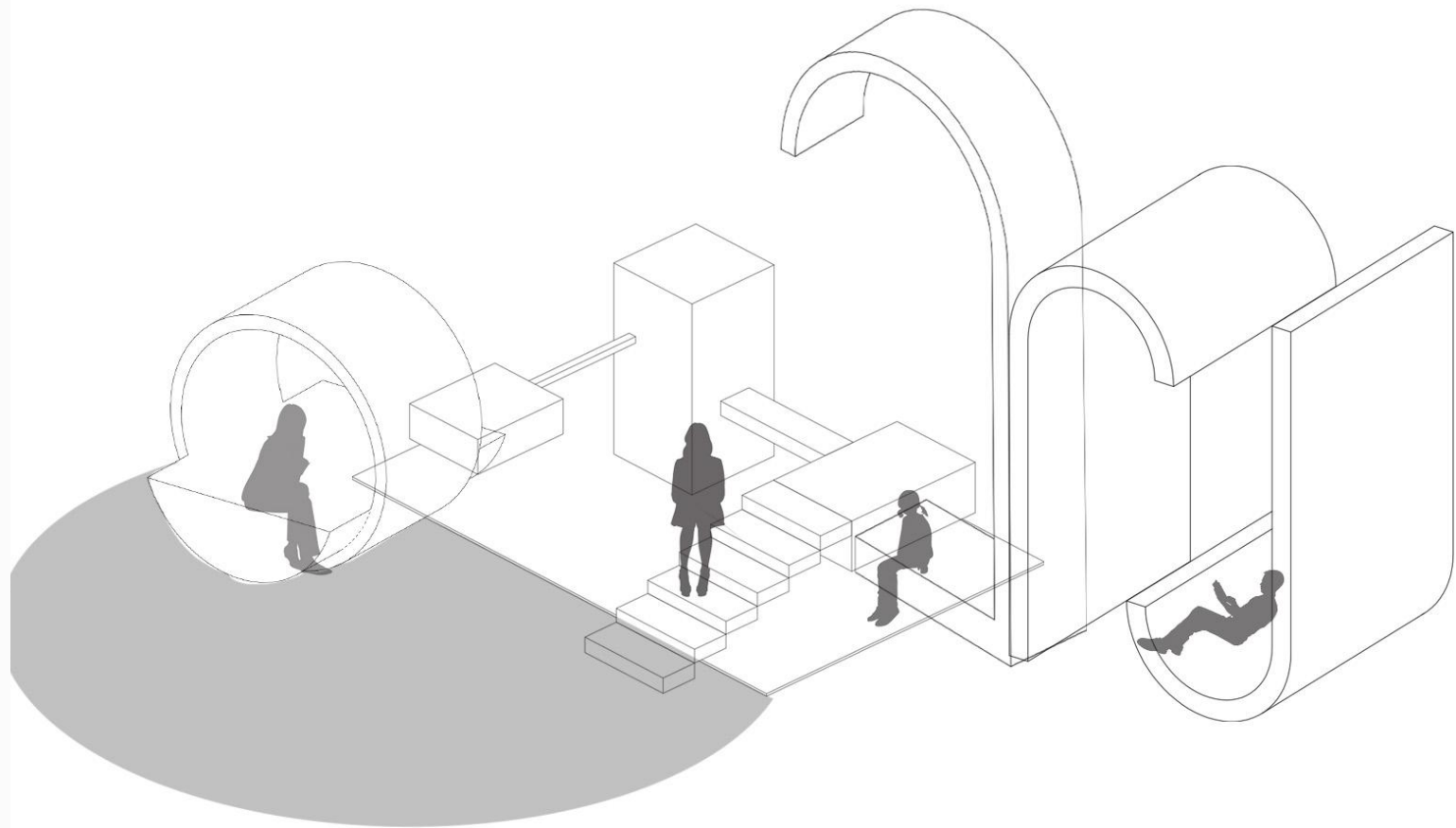
DESIGN PROCESS

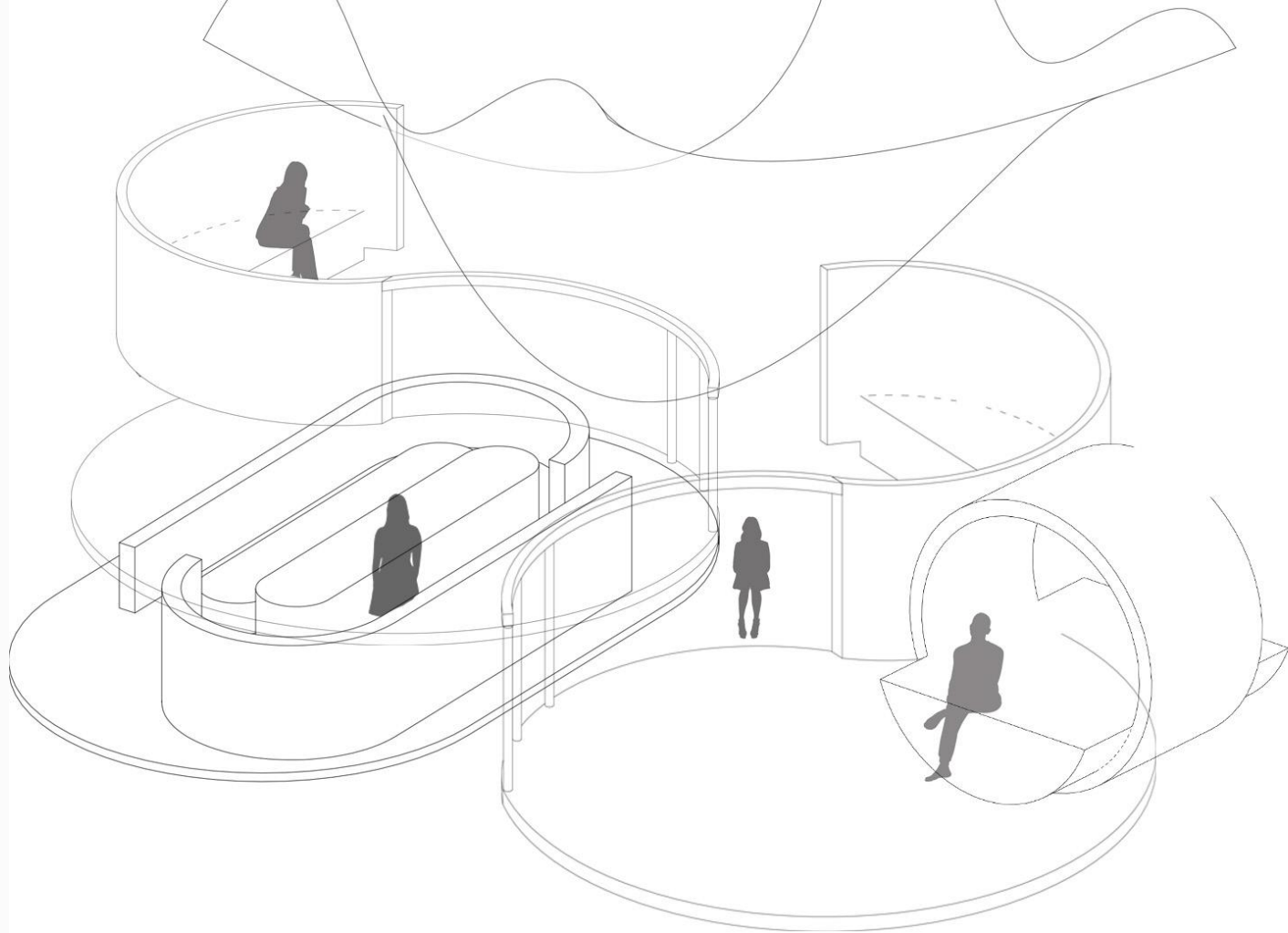












11

# FINAL DESIGN

STOW

# STOW

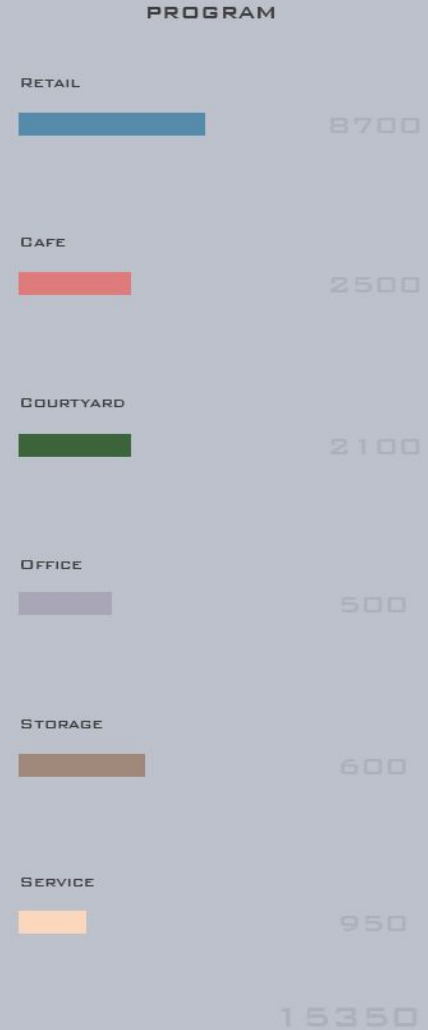
VERB. PACK OR STORE(AN OBJECT) CAREFULLY AND NEATLY IN A PARTICULAR PLACE



The thesis project explores how the elementary shapes and forms cooperate and translate the design functionality and circulation within multiple dimensions. The transition between graphic 2 dimensional and extruded 3 dimensional spatial elements create a complex yet minimal interior architecture which accommodates a diverse range of programmatic functions.

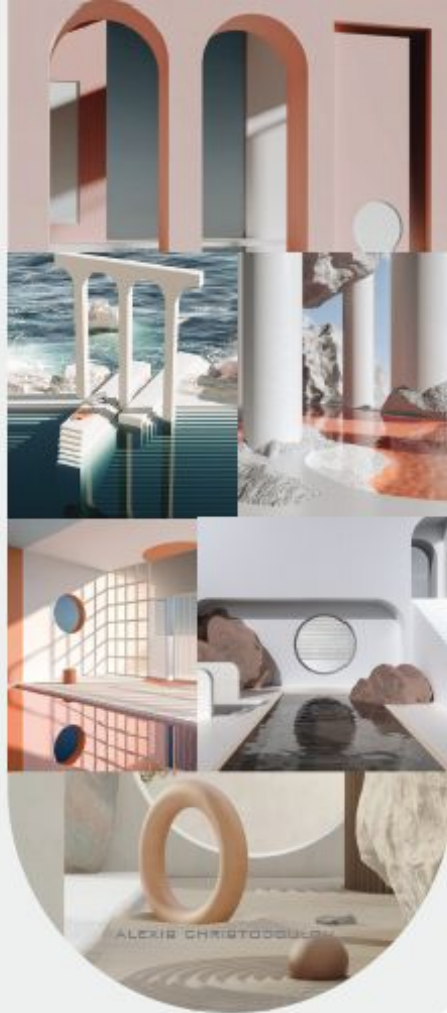
The Stow marketplace located at Stowe, Vermont, reconstructed from the previous retail and spa area of topnotch resort. Where has a considerable amount of visitors all year round as well as affirmative attraction to both visitors and local neighborhoods.

- Celebrates and nurtures Vermont's creative communities by curating a rotating selection of contemporary local artisans and brands including pottery, sculpture, painting, jewelry, wearable art, and photography.
- The marketplace and cafe feature a wide range of local products including produce specialty foods, artisanal cheese, microbrews, ciders, wine and chocolates.
- Provides an Interactive High-end design marketplace which facilitates meaningful exchange between visiting tourists and local community.
- The design finds inspiration from the local natural environment and translates this into a contemporary minimal aesthetic which highlights the distinct beauty of Vermont while also showcasing the diverse array of local goods from the surrounding areas.



## SITE

### Stowe, Vermont-Topnotch Resort



The design of the Stow in the fact of color is inspired by Havoc Hendricks, he is an minimalism artist whose art works present the complex patterns and colors found throughout nature. The design is also inspired by Alexis Christodoulou, a genre defining 3D artist and designer who focuses on digital imaginary architecture that reimagine our world through fantastic spaces and echo a more modern and clean minimal aesthetic.

## LOCAL ARTISANS, BRANDS & PRODUCE



  
farmhouse pottery

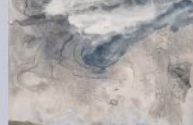
HERITAGE WOOL CO.  
VERMONT  


LAUGHING  
MOON  
CHOCOLATES

REBECCA HAAS  
// Jewelry //

LOCAL ARTISTS  
// Painting, Photography //

LOCAL PRODUCE  
// Stowe, Vermont //

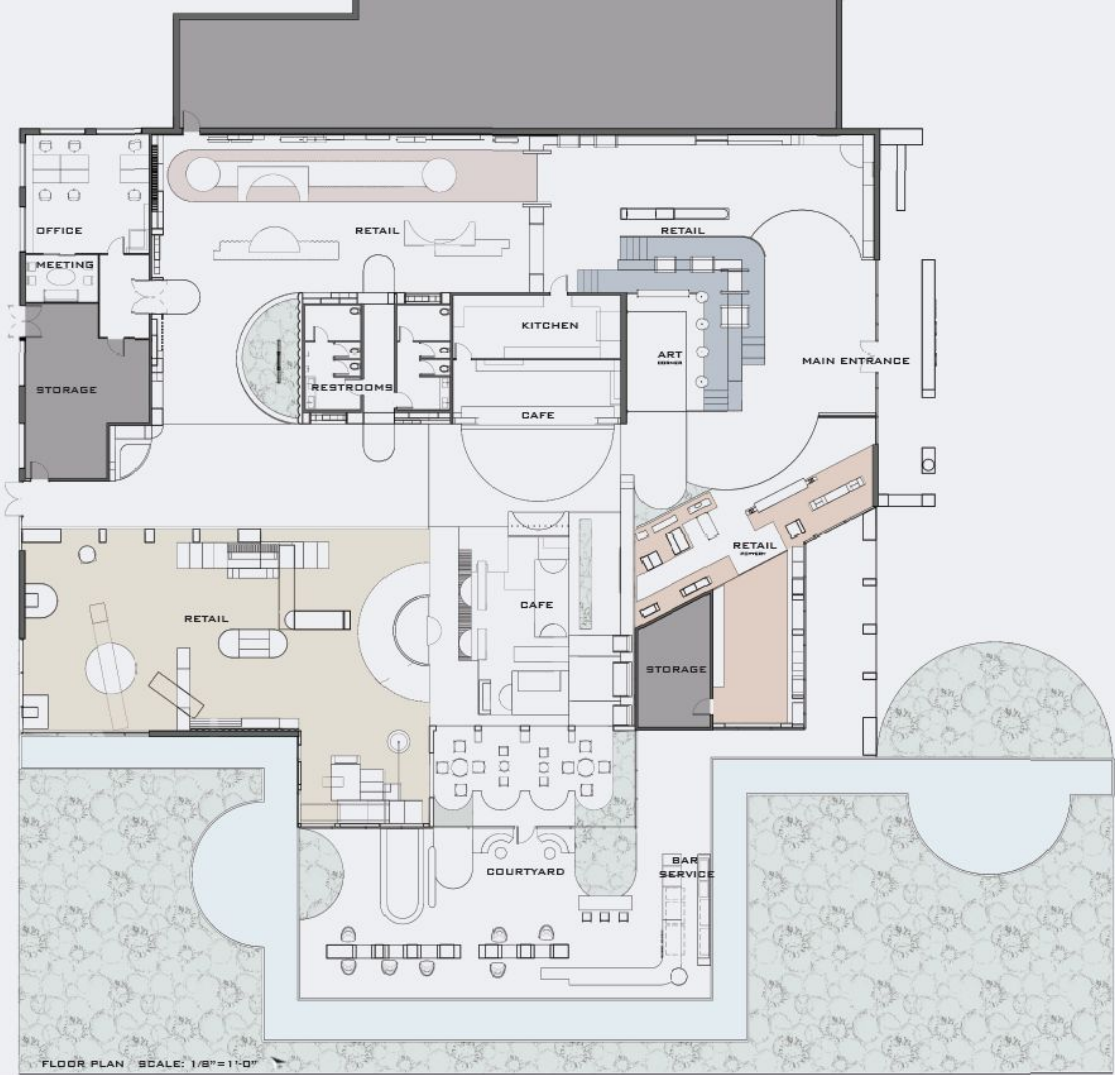
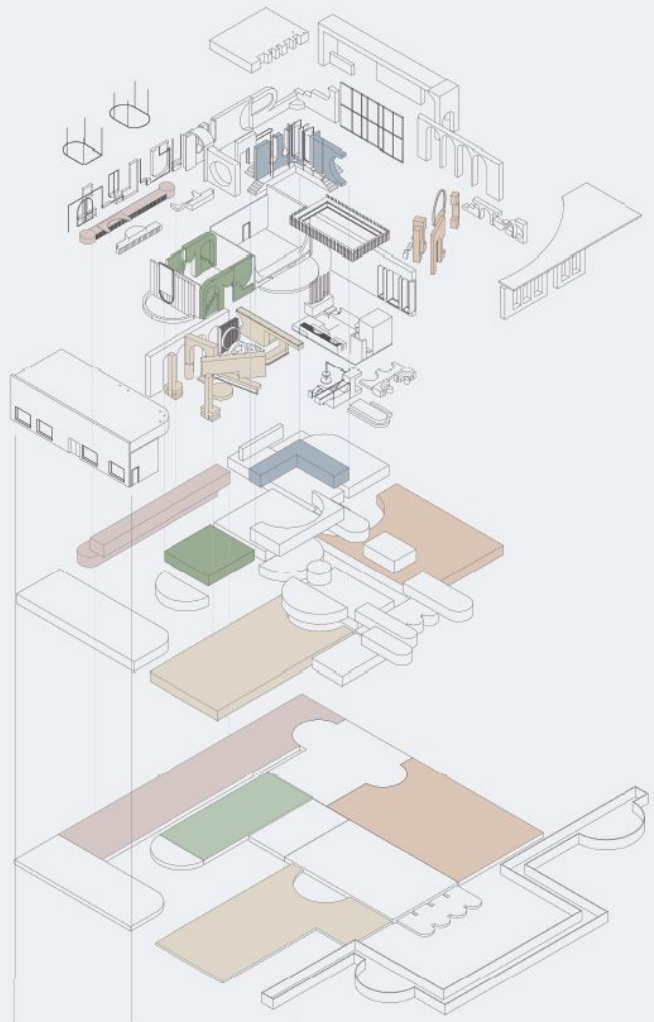



The retail area will feature local contemporary artisans, brands and produce. Here are some selected Vermont local product examples, including pottery, jewelry, handcrafts, artwork and food.



CONCEPT COLLAGE



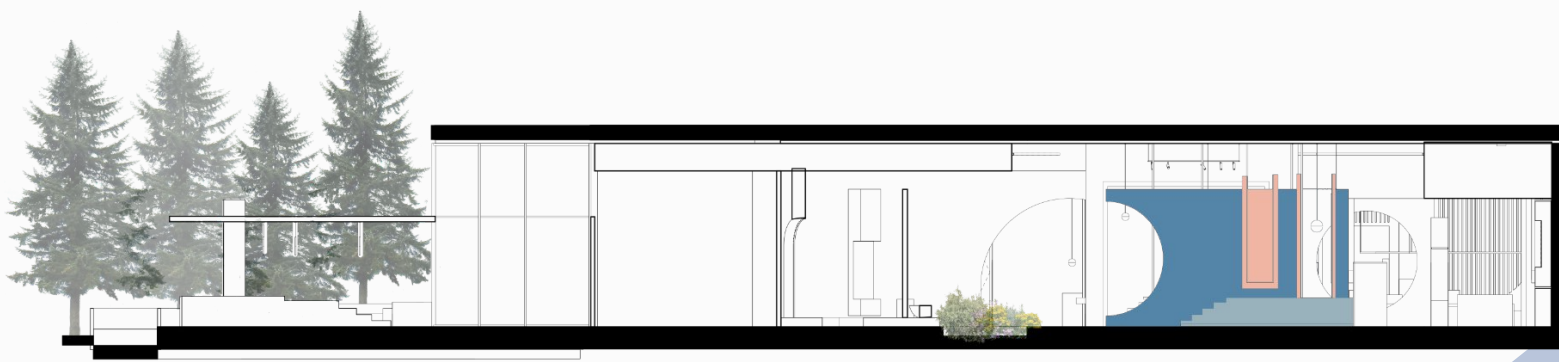




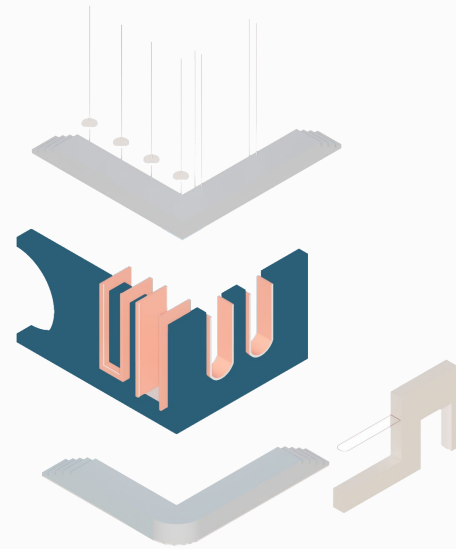
The design of the space started from zoning, developed into different elementary shapes and extruded into more detailed 3D forms to provide functionality and circulation. Also, to define boundaries of different spaces, the flooring uses different materials which creates shapes to highlight different areas.



ENTRANCE



Here is the view of the entrance, giving a first impression to the visitors, and also with the leveled up accessibility, the space wants to be interactive. With a dropped ceiling that follow the shape of the floor and different flooring materials define the boundaries of entrance and retail space.



ENTRANCE



## RETAIL

The featured pottery retail space, neutral colors are used here to provide a more clean background for the pottery display. And also the dropped ceiling and different flooring helps distinguish the areas. Lightings are embedded into the display structure and track lights are also used here for display.

Here is the service counter of the cafe. The half circle in different dimensions using on the floor, wall, and lighting highlight the space. On the side of the cafe is the restroom, the color helps with easier locating, and also displays are designed on the exterior wall. And here on the ceiling the linear lighting goes all the way back and circles around the whole space to provide a guide for the visitors as well as a continuous looking.





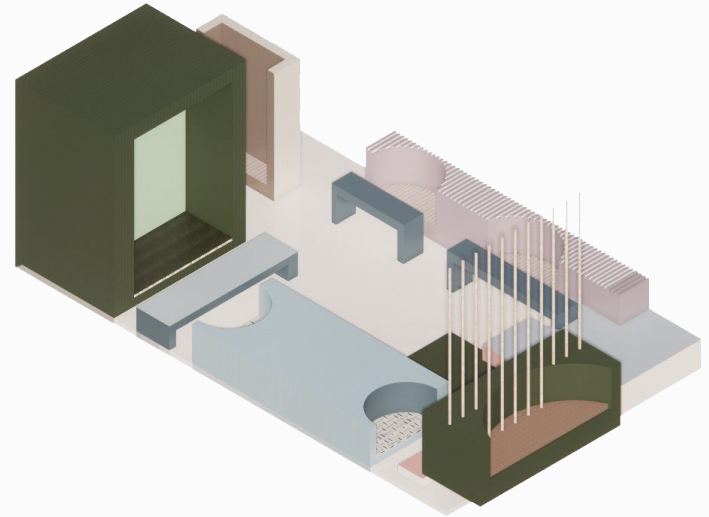
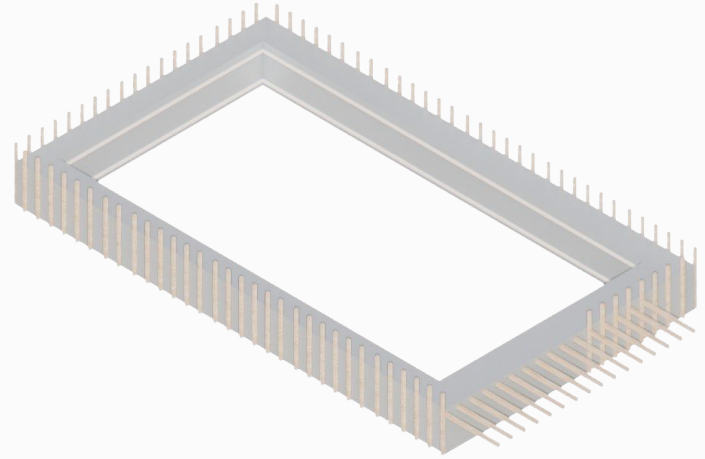
CAFE



CAFE



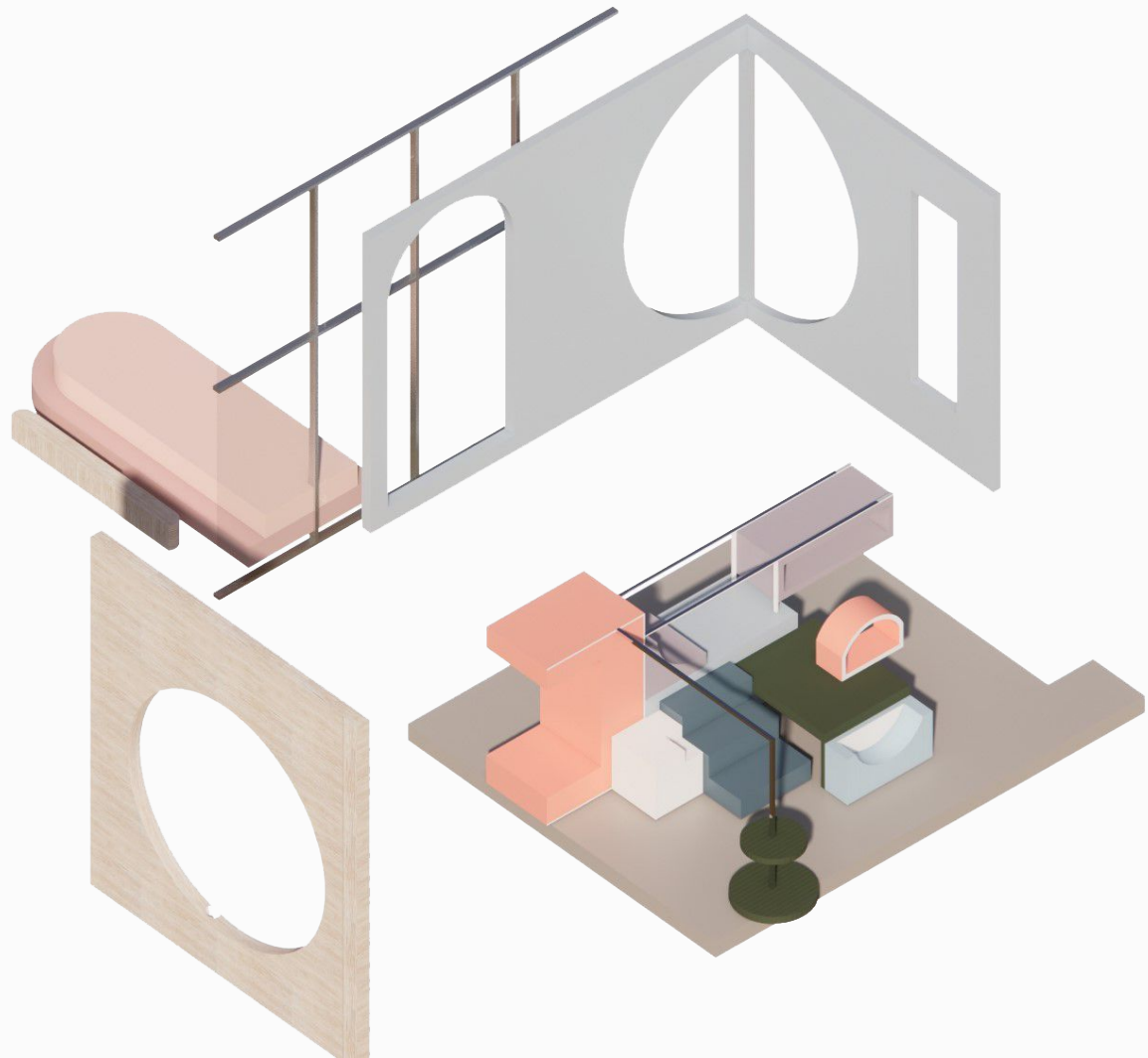
The cafe seating including a 7" sink down seating area, and there are also seatings along the wall, here with modeled structures on ground and on the wall, the design wants to give an interesting playful experience to the visitors. The ceiling up here covers the area with pendant lights highlighting the seating space.

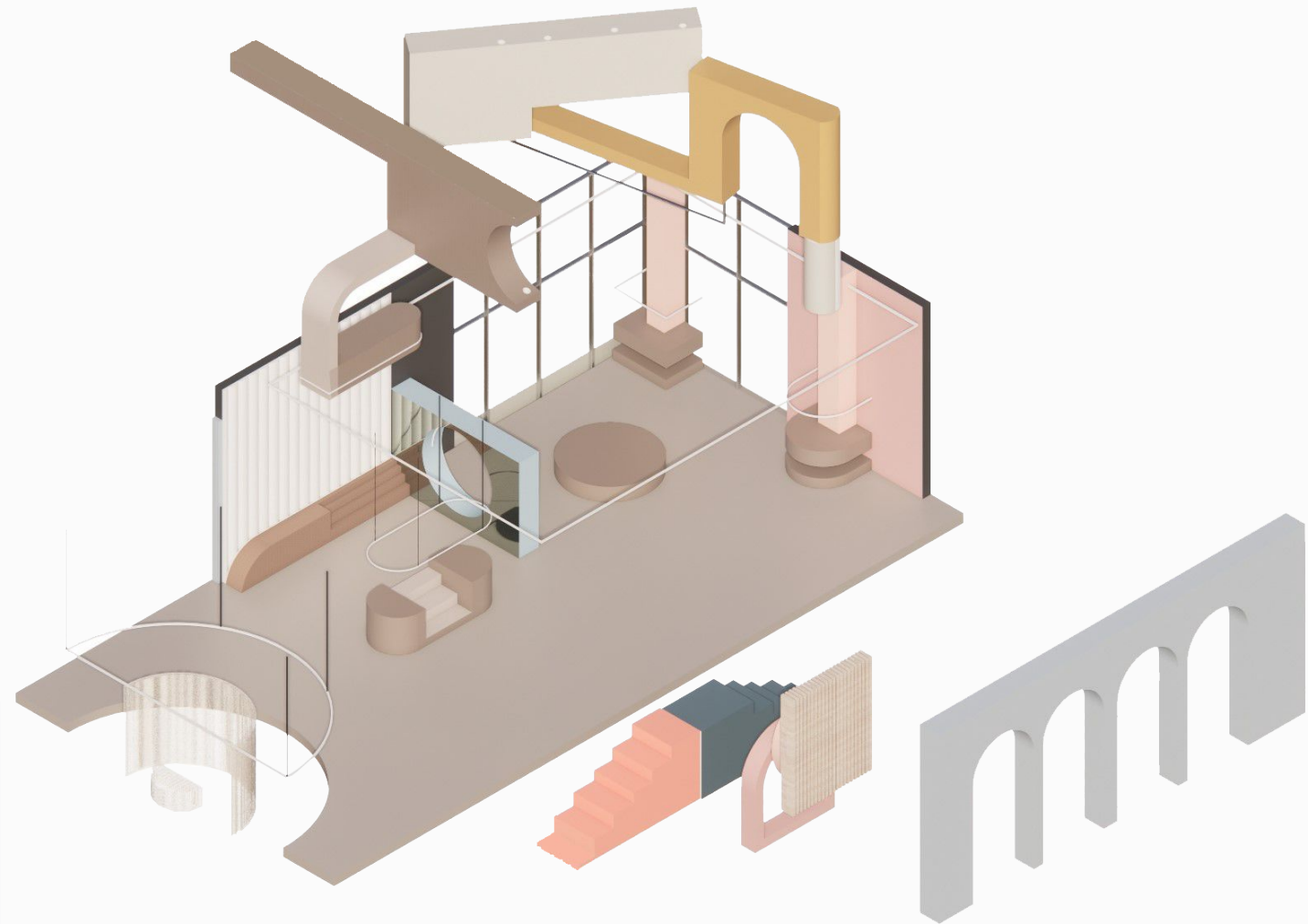




## RETAIL

This space with dropped ceiling and cutouts on the window continuously create an interesting looking. Also the cutout on the window continuously connects to the outside and becomes a seating area on the ground.





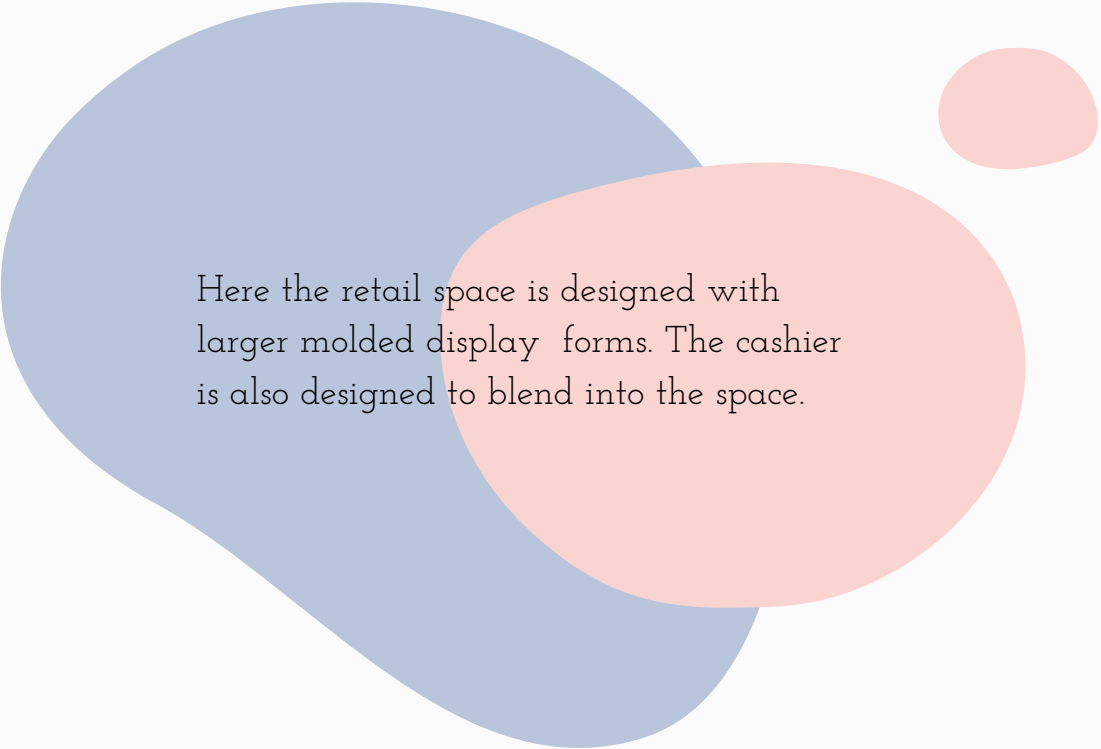
RETAIL



RETAIL





The image features a minimalist design on a white background. It consists of three overlapping organic shapes. A large, light blue shape is on the left, partially overlapping a larger, light red shape in the center. To the right of the red shape is a smaller, solid red circle. The text is centered within the blue and red shapes.

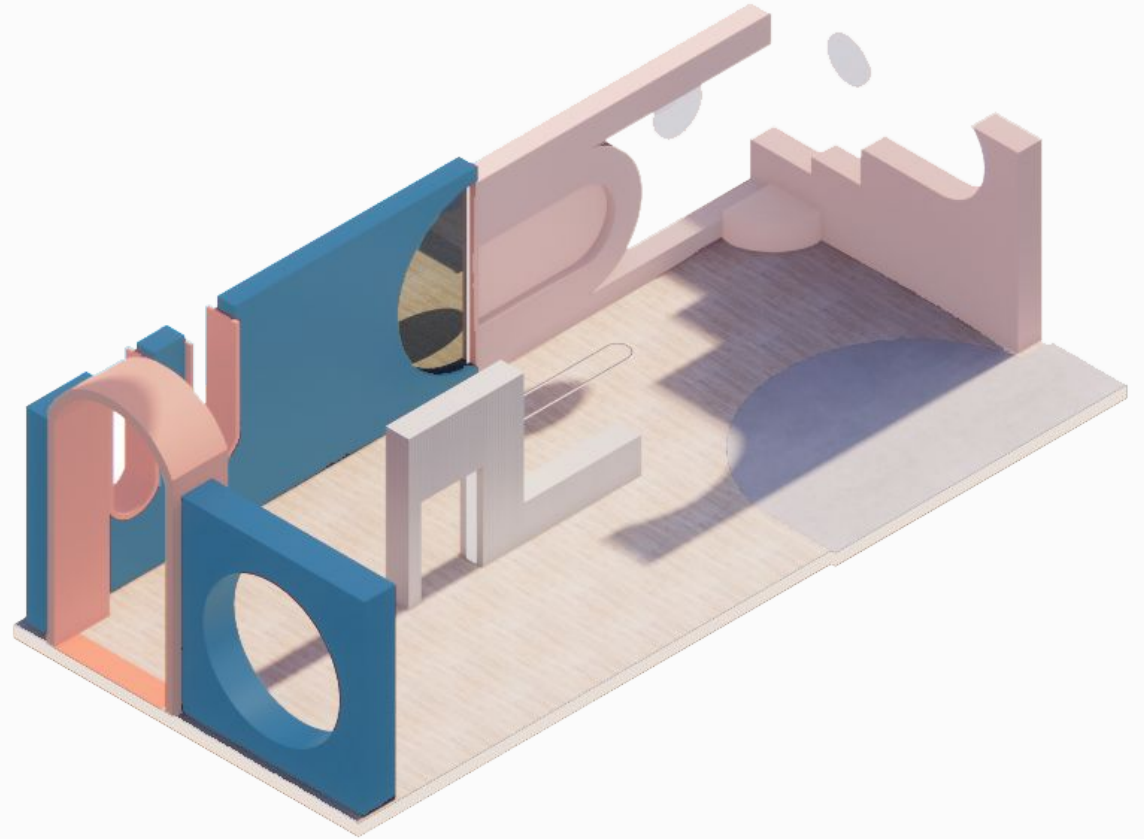
Here the retail space is designed with larger molded display forms. The cashier is also designed to blend into the space.

Located at the back of space is the storage and office, here is the corridor connecting the two sides, with seatings, display and a small plant area. And on the ceiling is where the linear lighting circles around, the different materials on the floor are used here to define different spaces.

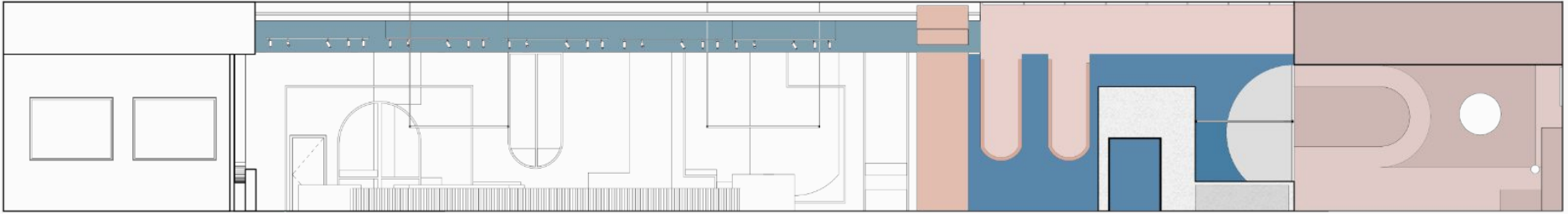




RETAIL







Turning around the corridor is the other side of retail space, mainly used for local handcrafts and produce. On the wall there are some display structures. Moving forward from the previous retail area here are some more display structures, as well as the cashier counter. The lighting drives from back to the front helps guide the visitors. And you can see the curved ceiling back there which highlights the other half of the retail space.

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# APPENDIX

INTERVIEW



# INTERVIEW

Interview 1: Yi Yuan - Interior & Furniture Designer - Atelier I-N-D-] Design Studio

1. What type of design project are you doing mostly and recently? And what is the most important factor that you will consider when designing these spaces?
  - Our firm concentrated on commercial and hospitality design projects, and we are obsessed into using new technologies and lighting performance, we also use 3-d print for some decorations in the space.
  - The most important things we consider when design are function, concept and efficiency.
2. When designing hospitality projects like restaurants and hotels, will you prefer to use structural forms to serve as furniture?
  - We will do that sometimes, the main reasons are it looks cool, and as an untraditional method, it will always help attract people.
3. When you build these structural forms into the space, what will you consider and what's the issue?
  - We will focus on whether it is interesting, it really serves any function, how it can be comfortable and the cost. There are also concerns from our client, mainly about flexibility and maintenance. It is not like furniture pieces which you can change or move easily when you want. So for this reason, we usually make this an unique attraction area of the space instead of applying this concept into the overall space.
4. For my thesis project, do you have any suggestions for me?
  - I would say be careful of how you occupy every space, you need to leave flexibility to the space, nothing will remain the same and design trends are changing every year, unless you can make it timeless.
5. You also did some furniture design projects, what's your agenda when designing these?
  - This depends on our client's needs, some want unique, cool pieces and some want simple and comfortable. But of course it will blend in both of these, we think furniture serves people, so comfortable must be the most important thing, then design it!

## Interview 2: Lodge Front Desk - Hob Knob Inn - Stowe, Vermont.

1. How's things changed since covid?
  - We are not fully occupied, less visitors are coming from out of state, we closed our restaurant, and we don't provide daily room service, although some other resorts still do that.
2. Stowe is most famous for skiing, what's the situation of non ski seasons?
  - Usually there will be more guests during ski seasons, but people also come in other seasons, not a lot, but there are. Some people come for hiking, golf and other activities, and some just come to have a getaway trip.
3. So for the ski users, what do you think they need most?
  - Stay warm, breakfast, comfortable sleep, and relax services like hot tubs, unfortunately we shut down the hot tub because of covid. And I think it will be great if we have a dog park, you see we have 2 dogs in the office, and for the guests they usually leave their dogs in the room in the daytime, sometimes we get complaints of dog bark from other guests and we are also concerned about leaving the dog alone.

## Interview 3: Zheng Yang - Graduate Architecture student at Kyoto University

1. Are there still a lot of people living in the traditional lifestyle?
  - Yes, a lot, people live in the city usually have limited home size, Japan is a small place, the apartment is usually tiny, so to save more space, you can see in many homes they don't have large tables or beds. Sleeping and sitting on the tatami is a better option in their culture. But also there are also people in luxury apartments who live in a modern way, it depends.
2. Are you seeing this cultural lifestyle applied into modern hospitality design?
  - A lot, lots of restaurants use tatami, and there are also some free form projects happening, the designer will consider more about the relationship between body and environment.

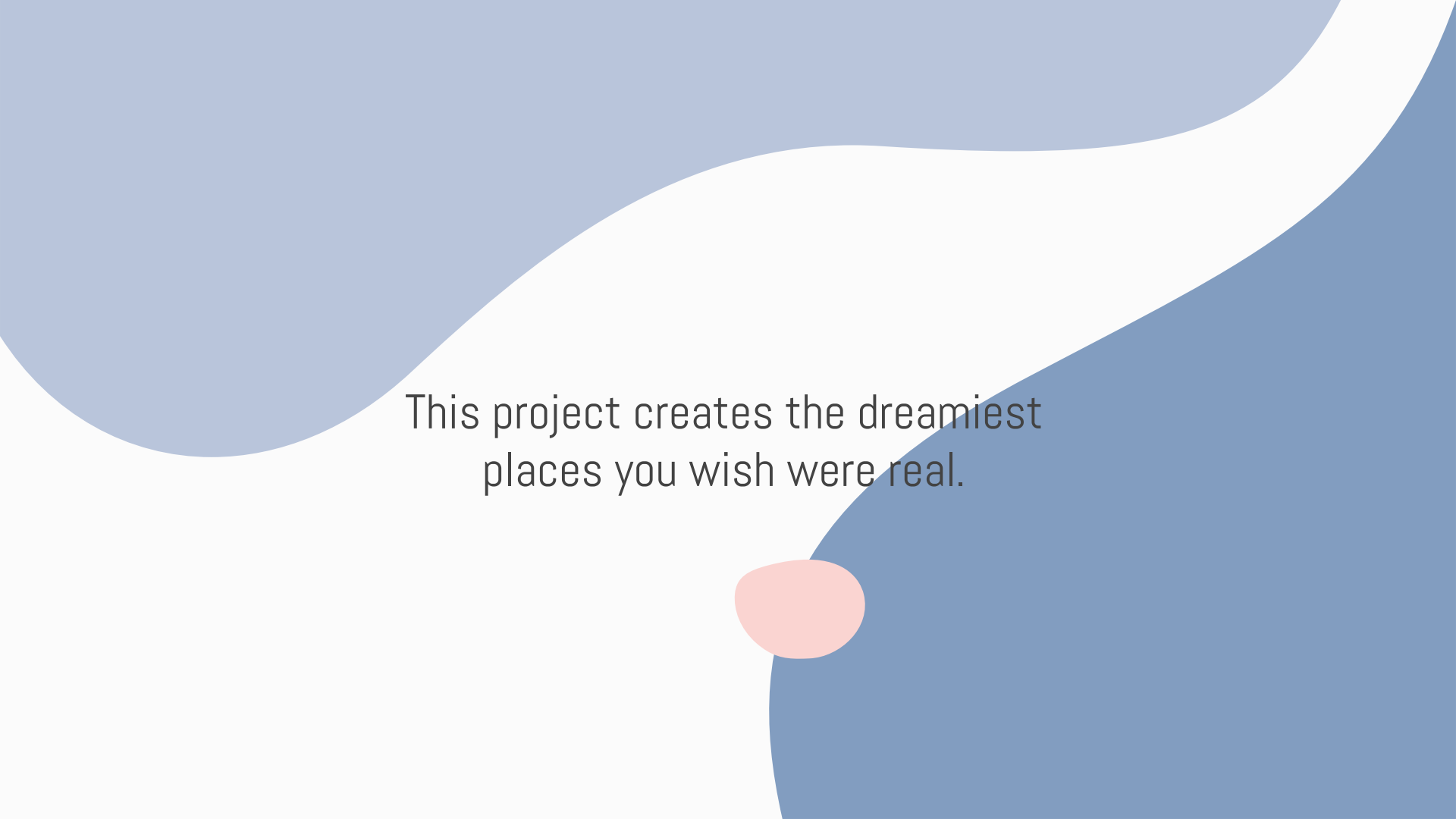
DESIGNED BY:

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ADVISOR: ASSOCIATE PROFESSOR -NICOLE KOLTICK

DREXEL UNIVERSITY



The background features a white central area with light blue wavy borders on the top and left. A darker blue shape is on the right, with a pink oval overlapping its edge.

This project creates the dreamiest  
places you wish were real.