Spring 5-9-2023

Wasteful to Useful: Investigating the metamorphosis of textile for construction methods

Elizabeth Rodriguez

WASTEFUL to USEFUL

KENNESAW STATE UNIVERSITY

Wastefule to Useful

Investigating the metamorphosis of textile for construction methods

Approval of Thesis Research
Project Book is Presented to:

Ameen Farooq

and to the
Faculty of the Department of Architecture
College of Architecture and Construction Management

By

Elizabeth Rodriguez

In partial fulfillment of the requirements for the Degree:
Bachelor of Architecture

Kennesaw State University
Marietta, Georgia

May 9, 2023

Dedication

/dedicación/

I would like to dedicate this thesis to all those who have supported and encouraged me during the past 5 years. Quisiera dedicar esta tesis a todas aquellas personas que me han apoyado y me animaron durante los últimos 5 años.

I would like to express my gratitude towards my professor Ameen Farooq. Thank you for your continued guidance, support, and for encouraging me to keep moving forward. I greatly appreciate all the constructive feedback and for constantly supporting me.

To my mother, Irene Rodriguez for all sacrifices you made for my future. Para mi madre, Irene Rodriguez, y todos los sacrificios que tuvistes que hacer para mi futuro y tu apoyo incondicionalmente. Por empujarme a ser la mejor version de mi. Te lo agradeszco del fondo de mi corazon.

To my father, Jose Rodriguez, for showing me how strong I can be and supporting me. Para mi padre, Jose Rodriguez, que me enseyo que tan fuerte soy y por apoyarme en todo.

To my siblings, for keeping me sane and bringing joy into my life even in times of hardships. Thank you for all the laughs and crazy adventures.

To all my friends, for being there during my lows, highs, and long long nights. I could not have made it through these past five years without your support.

Por ultimo, pero no menos importante, a mi Dios tan grandioso que me dio la perseverancia para seguir adelante en tiempos de adversidad y por darme esperanza.

CONTENTS

/contenido/

01

Introduction

/introducción/

1.0 Thesis Abstract

Every year, the average American generates over 80 pounds of textile waste. Since the 1990s, consumer behavior has shifted as mass production of items has become the norm. Production of clothing alone already impacts the environment as it requires immense amounts of chemicals, energy, water, and other natural resources. So, when consumers throw away clothing and brands decide to discard overproduced items, it ends up in landfills where it takes over 200+ years to decompose. Furthermore, a large percentage of unwanted clothing will be sent off to third-world countries to try to resale or recycle. Yet, the amount being imported is so immense that they cannot process it all, leading to landfilling on their land. The U.S. alone generates an estimated 92 million tons of textile waste each year- around 2,150 pieces per second.

This thesis investigates the pollution produced by textile waste and develops an architectural solution that as a basis will redesign the current fashion house by incorporating sustainable techniques created through the use of textiles. An architectural solution that would start to question the actions of both consumers and fashion brands themselves. The goal is to achieve a design that not only provides a solution to the problem but also serves as a precedent for a more sustainable cycle in the textile and construction industry.

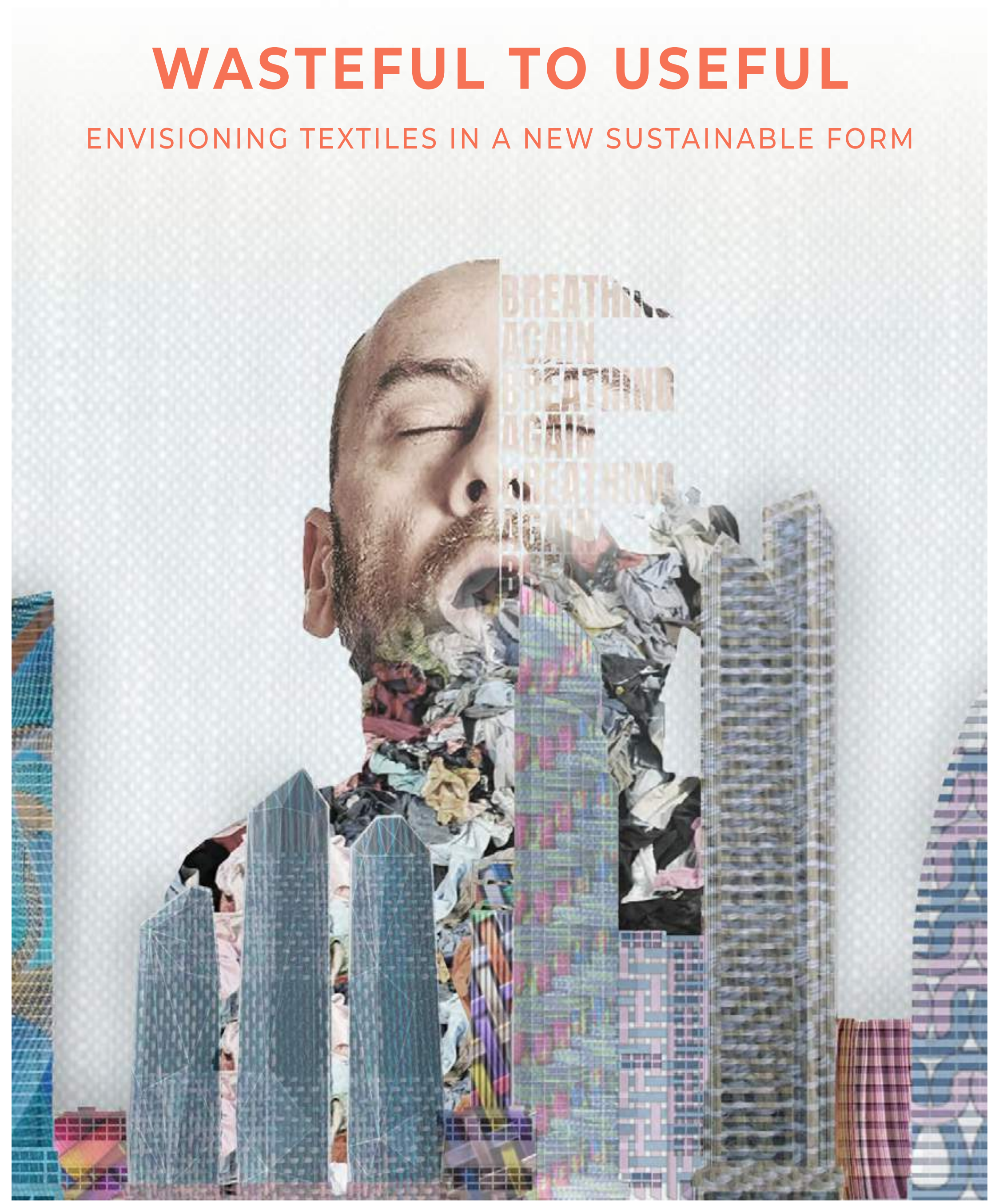


Figure_1.0 Thesis Poster

1.1 Research Questions & Objectives

Figure_1.1 Different Colored Fabrics

[RESEARCH QUESTIONS]

[1] How can design promote conscious consumerism and sustainable production of clothing?

[2] How do the properties of common textiles used in fast fashion like polyester, nylon, rayon, and acrylic affect their workability in construction methods/processes?

[3] How can these materials be played out architecturally & structurally interplay in the building?

[4] What are the potential metamorphoses of polyester, nylon, rayon, and acrylic?

[5] What role/effect/impact can textiles have on spaces? (connection, experience & awareness, the human condition, etc)

Figure_1.2 Mass Production

[RESEARCH OBJECTIVES]

[1] To investigate the properties of nylon, polyester, acrylic, and rayon in relation to being implemented in construction methods/processes.

[2] To deter the mass production of clothing.

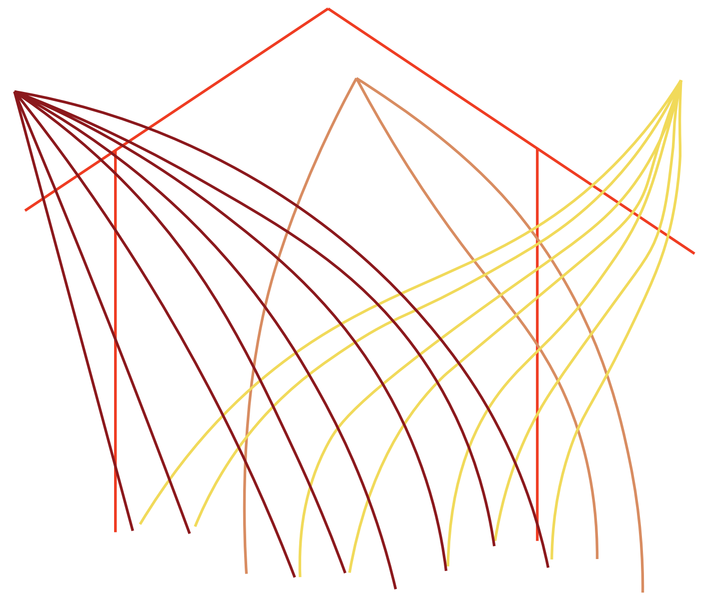
[3] To promote sustainable practices in the everyday consumer and clothing designer.

[4] To create a precedent for fashion houses and decrease the impact of the pollution created by their clothing production.

02

Research

/investigación/



FASHION HOUSE

/casa de moda/

Fashion allows us to be unique, is a part of our daily lives, and allows us to make statements. A few decades back though it started to become a very fast-changing concept allowing consumers to purchase the latest trends at a cheap price.

Why a Fashion House?

Fashion consumption has been exponentially affecting the environment but as Simone Cipriani once said, “Fashion can be a universal player in protecting the planet.” What better way than to set the example of a sustainable fashion house using textile waste to act as a player to protect the planet.

2.0 Terminology

[ACRYLIC FIBER] / fibra acrilica / *noun*
Acrylic fiber are made from a synthetic polymer called acrylonitrile, a fossil fuel-based fiber.

[EQUALITY] / igualdad / *noun*
The state of being equal, especially in status, rights, and opportunities.

[FASHION HOUSE] / casa de moda / *noun*
A company specializing in the design and sale of high-fashion clothing and accessories.

[FAST FASHION] /moda rapida/ *noun*
Inexpensive clothing produced rapidly by mass-market retailers in response to the latest trends.

[NYLON FIBER] / fibra de nailon/ *noun*
A silk-like thermoplastic, generally made from petroleum, that can be melt-processed into fibers, films, or shapes.

[POLLUTION] / contaminación / *noun*
The presence in or introduction into the environment of a substance or thing that has harmful or poisonous effects.

[POLYESTER] / fibra de poliester / *noun*
A synthetic fabric that's usually derived from petroleum. This fabric is one of the world's most popular textiles, and it is used in thousands of different consumer and industrial applications.

[RAYON] / fibra de rayón / *noun*
Made from cellulose that has been reformed or regenerated; consequently, these fibers are identified as regenerated cellulose fibers.

[RESOURCE] / recurso / *noun*
All the materials available in our environment which are technologically accessible, economically feasible and culturally sustainable and help us to satisfy our needs and wants.

[SUSTAINABLE] / Respetuoso del medio ambiente / *adjective*
Consists of fulfilling the needs of current generations without compromising the needs of future generations, while ensuring a balance between economic growth, environmental care and social well-being.

2.1 Most Common Textiles in Fast Fashion

The most common textiles used in fast fashion tend to be made from synthetic materiasl that are not biodegradable and release harmful chemicals when they are manufactured. Around the 1980s, mass production grew exponentially and as seen below in figure 2.0 11,300,000 tons in 2018 were landfilled and that number has grown to 8 times in just the past year.

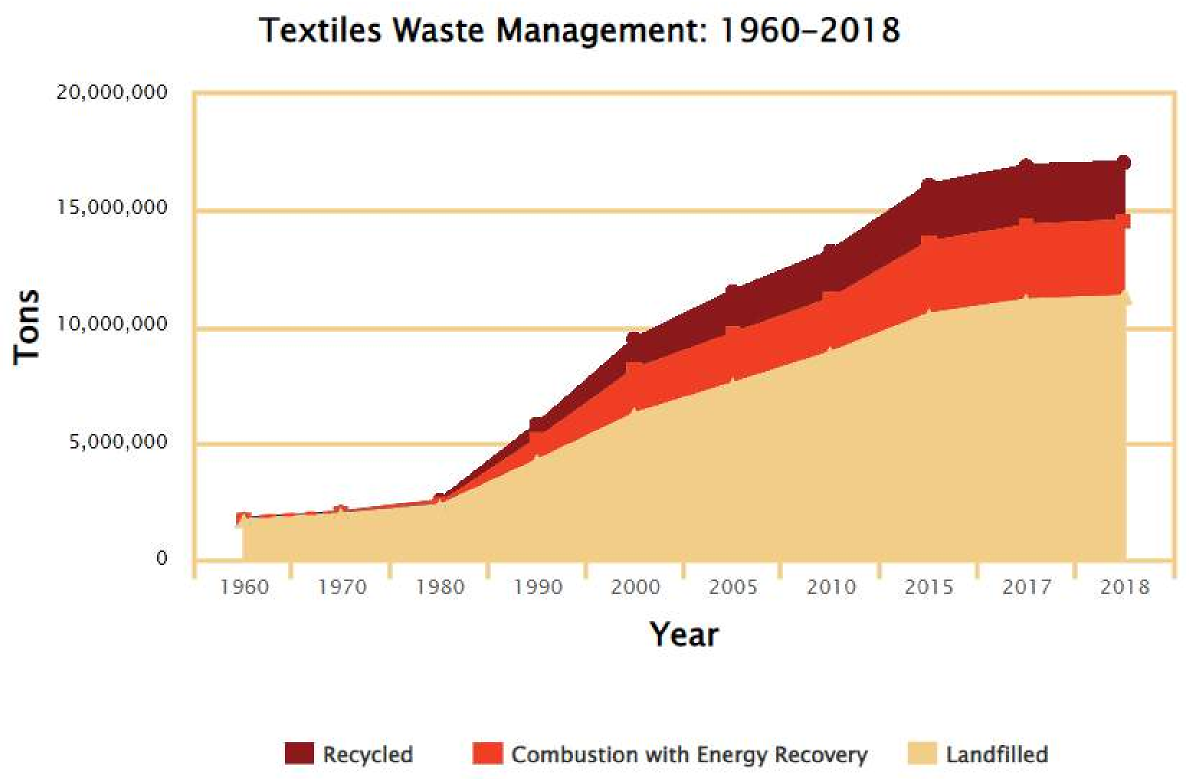


Figure_2.0 Textile Waste Management

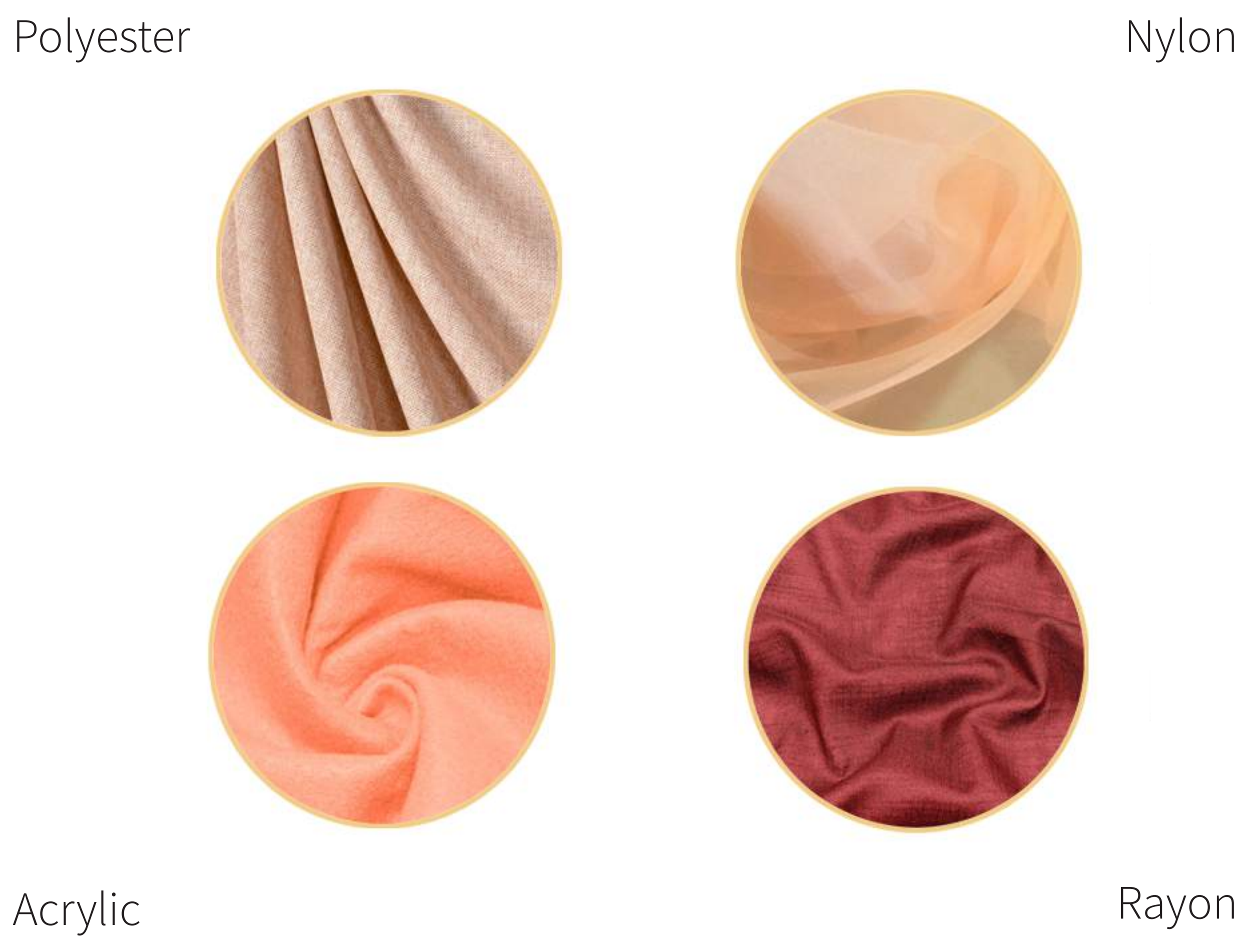


Figure_2.1 Fast Fashion Textiles

2.2 Impact of Fast Fashion

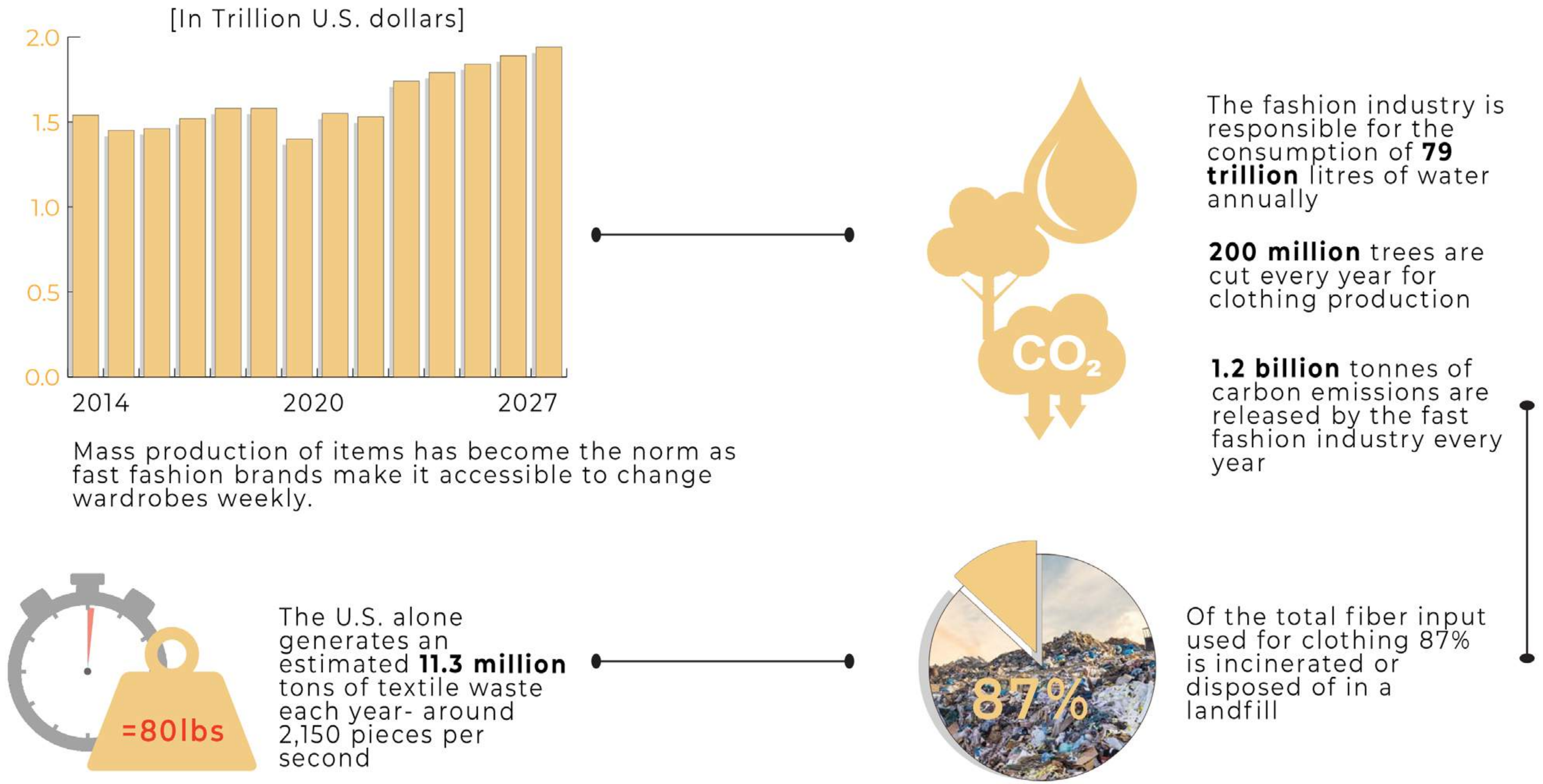


Figure_2.2 Environmental Impact of Textile Waste

2.3 Material Properties

This matrix showcases how each material compares to each other in the form of fibers. The data is represented based on performance in the form of fabric and such qualities are only reinforced when used in construction processes.

	STRENGTH	ELASTIC	MOISTURE RESISTANCE	LOW COST	HYDROPHONIC	RESISTANCE TO SHRINKAGE	MOISTURE WICKING	DURABLE	RESISTANCE TO MILDEW	DRIES QUICKLY	RESILIENT	INSULATIVE
ACRYLIC		●	●	●	●		●	●	●	●	●	●
NYLON	●	●	●	●		●	●		●	●	●	●
POLYESTER	●	●	●	●	●	●	●	●	●	●	●	●
RAYON		●		●					●	●		

	Project	Architectural Use of Textile	Other Architectural Uses	Findings
ACRYLIC	 Figure_2.3 Nylon Fins on Apt	**Boutique Apartment /St. Kilda, Australia** Features some unique 'fins' on the facade fabricated from Perspex Frost acrylic sheets which gives an effect similar to that of sandblasted or etched glass.	Acylrics have a wide range of uses in the construction industry as they can be used in: paints, concrete, mortars, asphalt, coatings for metals, glass reinforced plastic, thermoplastic materials in buildings, and tranparent insulation materials.	Acrylic has been often used as an alternative to glass due to being lightweight and shatter-resistant. Additionally it is cheaper than glass. Many medical spaces have used acrylic for partition walls as they come in bright opaque colors.
NYLON	 Figure_2.4 Nylon Fin on Apt	**Old multi-story building/ Shanghai** An inflatable antibacterial nylon exterior serves two purposes: to amplify the sunlight that enter each room and to create the best possible climate inside the building, whether it's summer or winter. The air space in-between the inflatable and the glass window act as efficient insulation for a desirable interior temperature.	Nylon application in the construction industry include: sheets, rods, tubes, pipes, screws, washers, plumbing fittings, carpeting, crane pads, industrial hammer heads, and canopies. Nylon can also be easily melted into filaments for use in 3D printing and other machining.	Nylon when used as a fabric can be used to bring light into space that may not get any sunlight directly. Although, one may not be able to visually see through nylon fabric it better helps to insulate a space.
POLYESTER	 Figure_2.5 Heydar Aliyev Center	**Heydar Aliyev Center/ Baku, Azerbaijan/** The white shell is clad in Glass Fibre Reinforced Concrete and Glass Fibre Reinforced Polyester to create the fluid continuous shape that seamlessly connects the building's interior and exterior with the surrounding urban fabric.	PVC coated polyester is the most commonly used architectural fabric as it can last in excess of 20 years. Polyester is also used for anchoring grout and loop and lighting sealants. It also provides a more rapid cure and high compressive strength for concretes and mortars.	PVC coated polyester seems to be the most commonly used fiber as it allows for very free flowing shapes to be constructed from concrete. One of the biggest advantages is its non-corrosive properties and it can be used as cladding material of bent into wire frame structures.
RAYON	 Figure_2.6 24 Housing Units	**24 Housing Units/ Nancy, France /** The random pattern layout of the rayon fiber cement panels gives a certain flow on the facades, reflecting the movement of the street.	Some of the most common uses of rayon are in carpet. Viscose rayon when used in cementitious mixes has shown to reduce cracks, demonstrating the ability of fibers to hold cemented matrix aggregated, preventing the propagation of failures.	Rayon fiber has shown to enhance mechanical strength in concrete, but only up to .2% of the fiber within a mix is optimal. As any fibers beyond that creates segregation and formation of lumps which further develop voids in the mix.

03

Case Studies

/estudios de caso/

3.0Comparitive Design Characters of Selected Fashion Houses

Project | Site | Plans | Sections | Materiality | Geometry | Findings

Prada Building
Aoyama, Tokyo

Figure_3.0 Prada Building

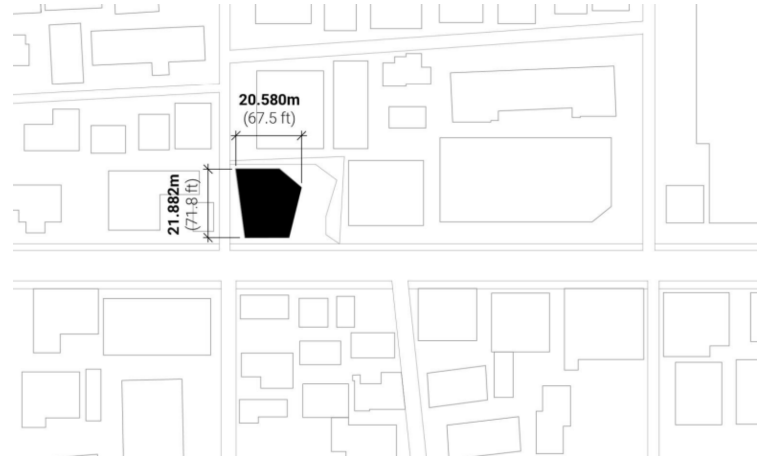


Figure_3.1 Prada Building Site

Figure_3.2 Prada Building Floor Plans

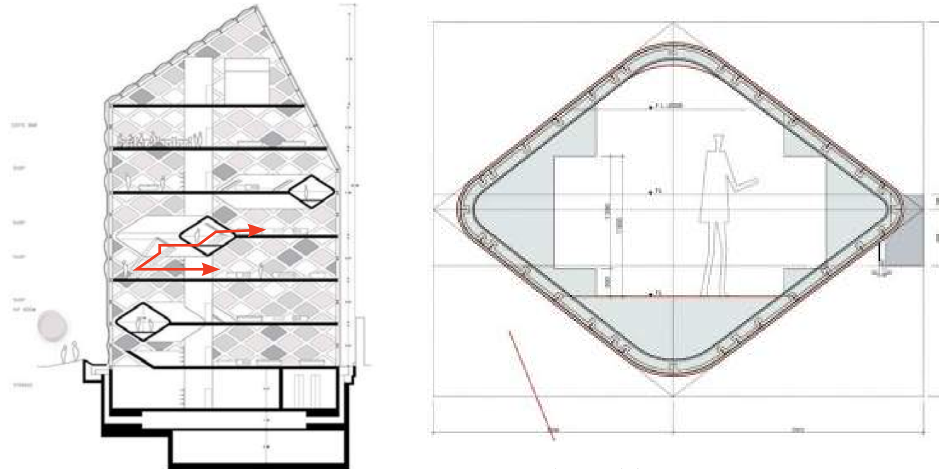


Figure_3.3 Prada Building Sections

Figure_3.4 Prada Materials

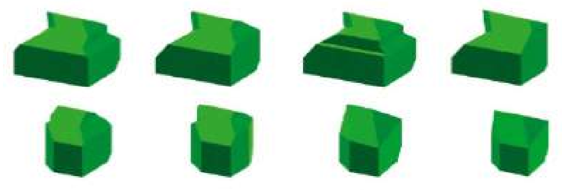


Figure_3.5 Prada Building Form

Fluid space between floors allows the space to be perceived as one continous space. The structure, space, and facade form a single unit. They did analysis of the zoning laws which helped determine the volume of the shape. A very visual scultptural shape that depending on the angle from which it is seen can resemble a crystal, house, and even 'bursa' a precious bag. Additionally the plaza in the entrance allows for a meeting point to take place allowing more people to come to the site. Some of the glass is curved and even seems to move as one walks around it and it contains a grid at a human scale making it almost old-fashioned, like display windows.

Fondation Louis Vuitton
Paris, France

Figure_3.6 Fondation Louis Vuitton

Figure_3.7 Fondation Louis Vuitton Site

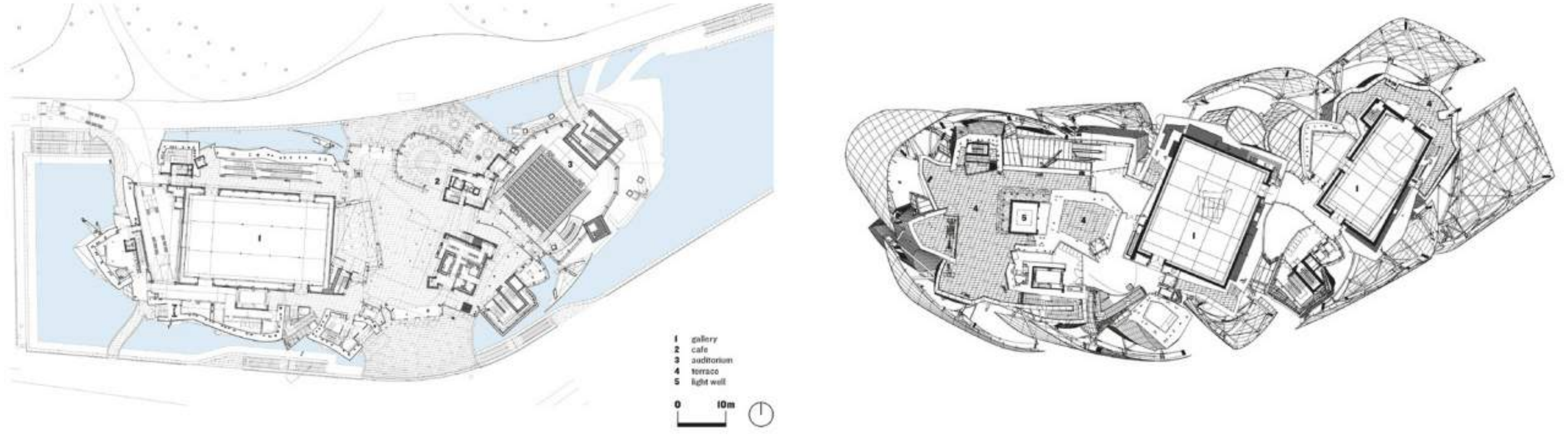


Figure_3.8 Fondation Louis Vuitton Floor Plans

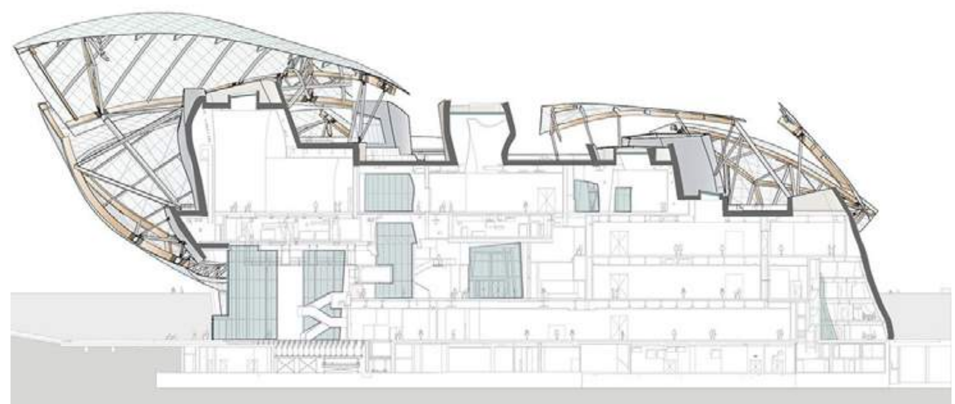


Figure_3.9 Fondation Louis Vuitton Section

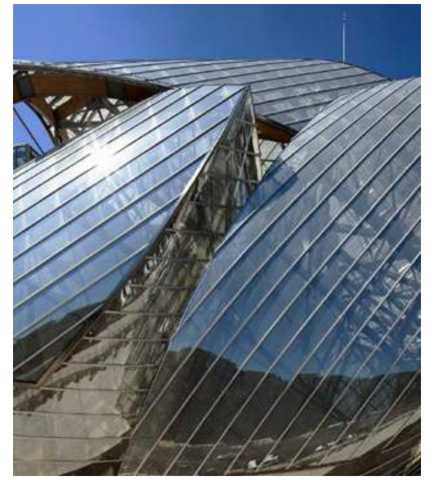


Figure_3.10 Fondation LV Materiality

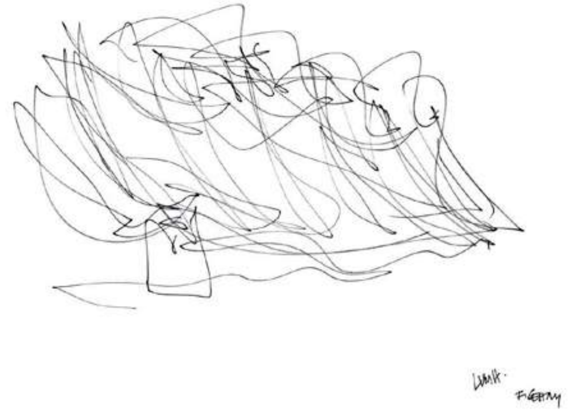


Figure_3.11 Fondation Louis Vuitton Form

The design of the structure has to do with humanizing and engaging the user and being episodic instead of singular in its experience.Circulation was fit into and around the galleries and other programmatic volumes. View lines were still established to the surrounding park incorporating nature into the spaces as well. The project had a limitation of two stories yet the incorporation of the glass enclosure allowed them to go beyond two stories. Additionally, the unique glass building takes the form of what seems to be sails of a sailboat inflated by the wind. The spatial program includes that beyond what a typical fashion house includes as it has a library, cafe, vip suite, as well as galleries, and an auditorium.

Gucci Headquarters
Scandicci, Italy

Figure_3.12 Gucci Headquarters

Figure_3.13 Gucci Headquarters Site

Figure_3.14 Gucci Headquarters Floor Plans

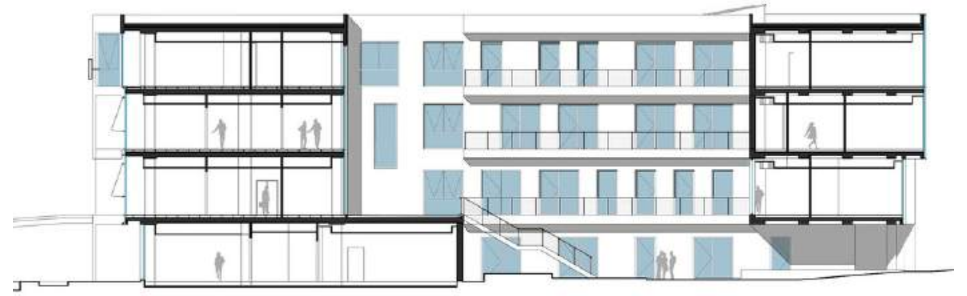


Figure_3.15 Gucci Headquarters Section

Figure_3.16 Gucci Headquarters Materiality

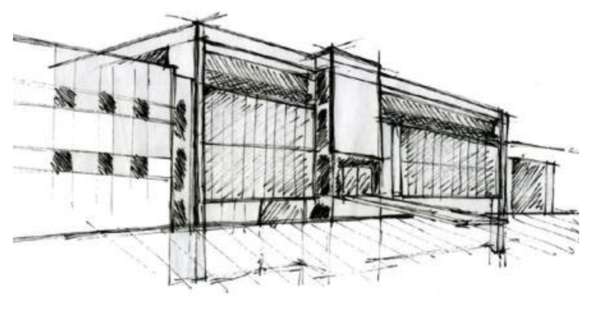


Figure_3.17 Gucci Headquarters Sketch

The fashion house is based on the most rigorous criteria for sustainability from the start as the selection of the site is even a pre-existing building which used to be a de-commissioned factory. Allowing for quality and high-fashion to co-exist alongside historical tradition. The continuity of the public areas are emphasized throughout the double and even triple height in the interior spaces such as the lobby. The exterior panels made of copper mesh are sandwhiched between glass panels to catch and reflect sunlight allowing each to be distinct in tone and colour.

3.1 Comparitive Spatial Program of Selected Fashion Houses

Prada Building
Aoyama, Tokyo

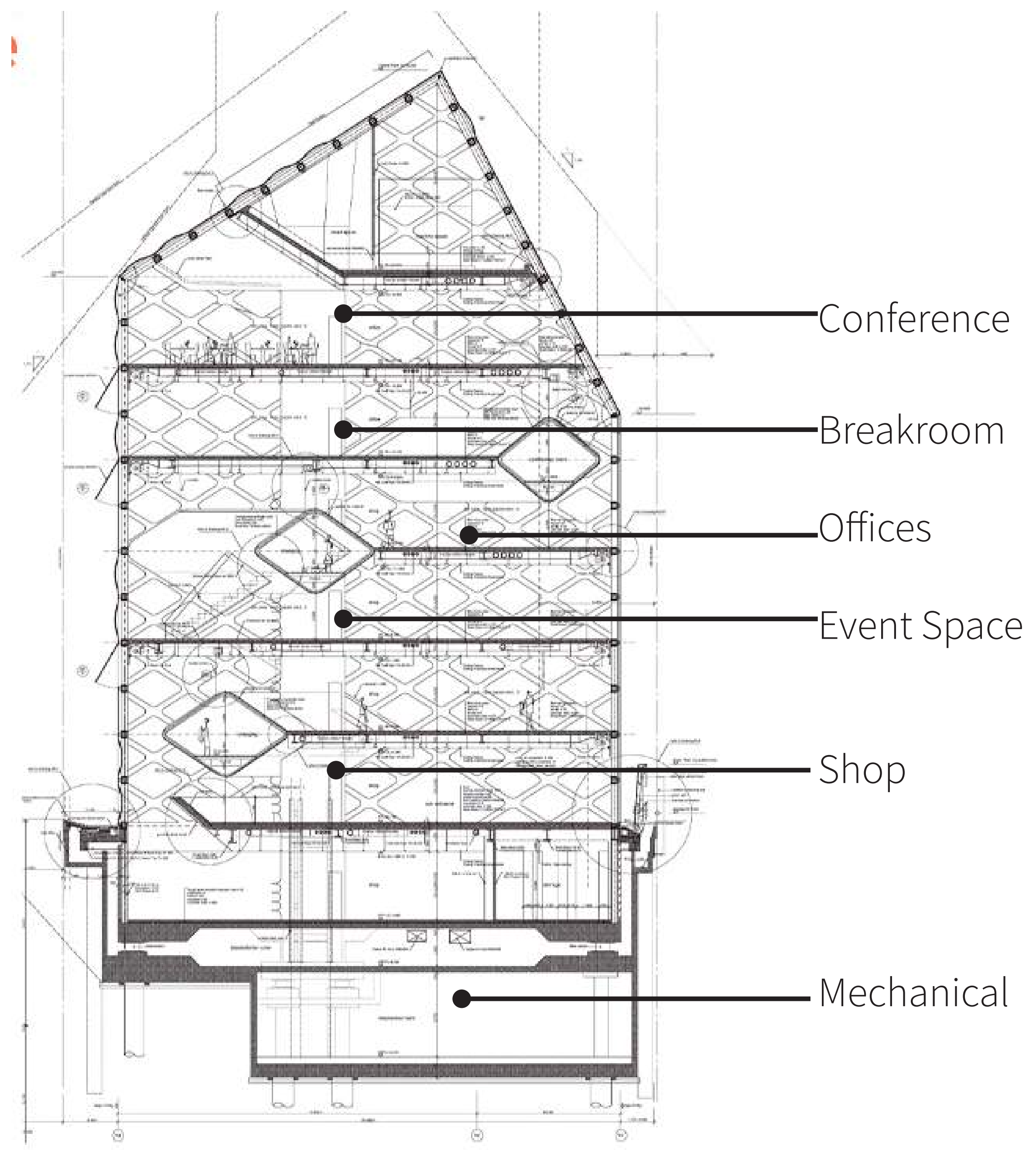


Figure_3.18 Prada Building Section

Fondation Louis Vuitton
Paris, France

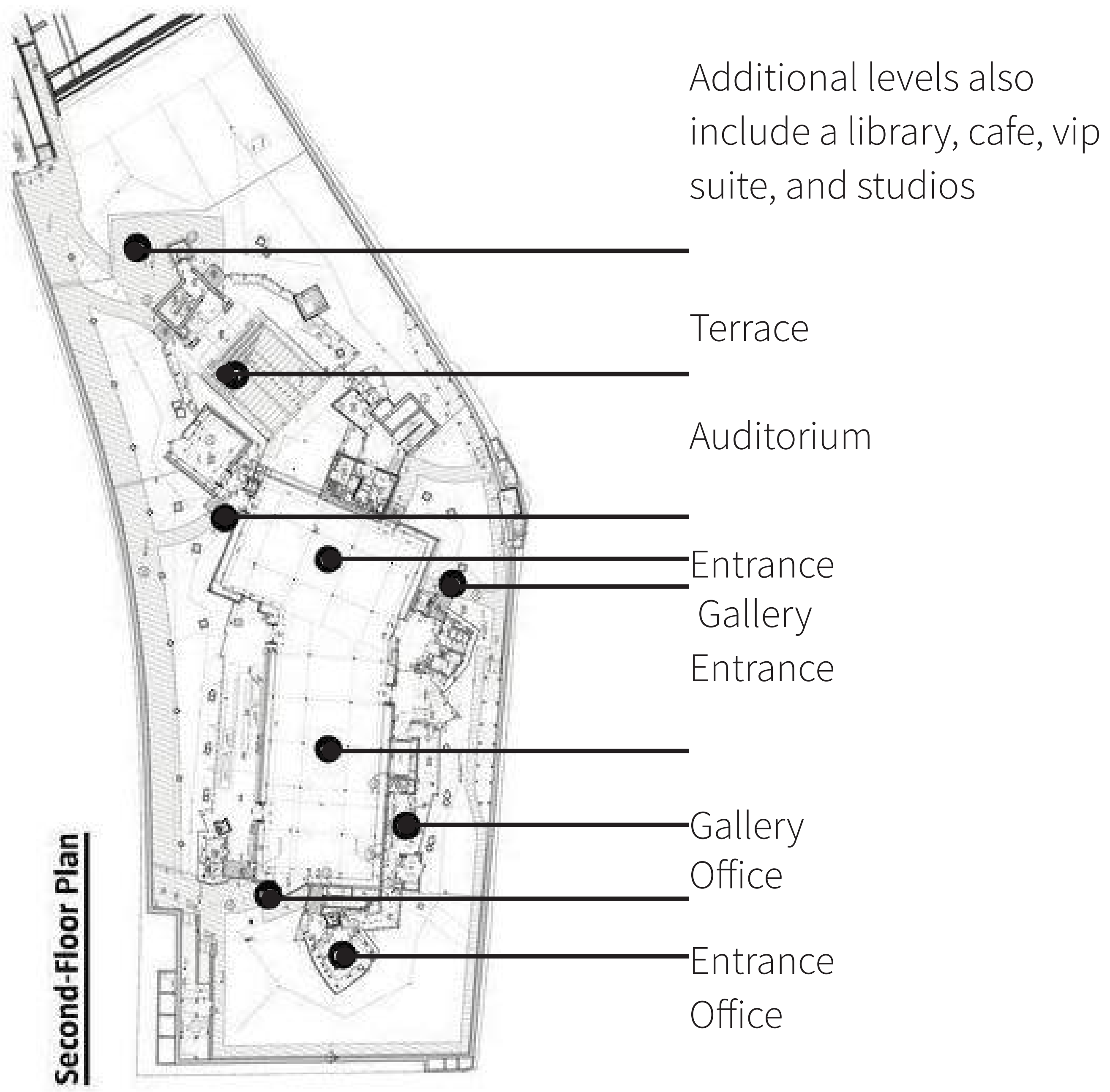


Figure_3.19 Fondation Louis Vuitton

Gucci Headquarters
Scandicci, Italy

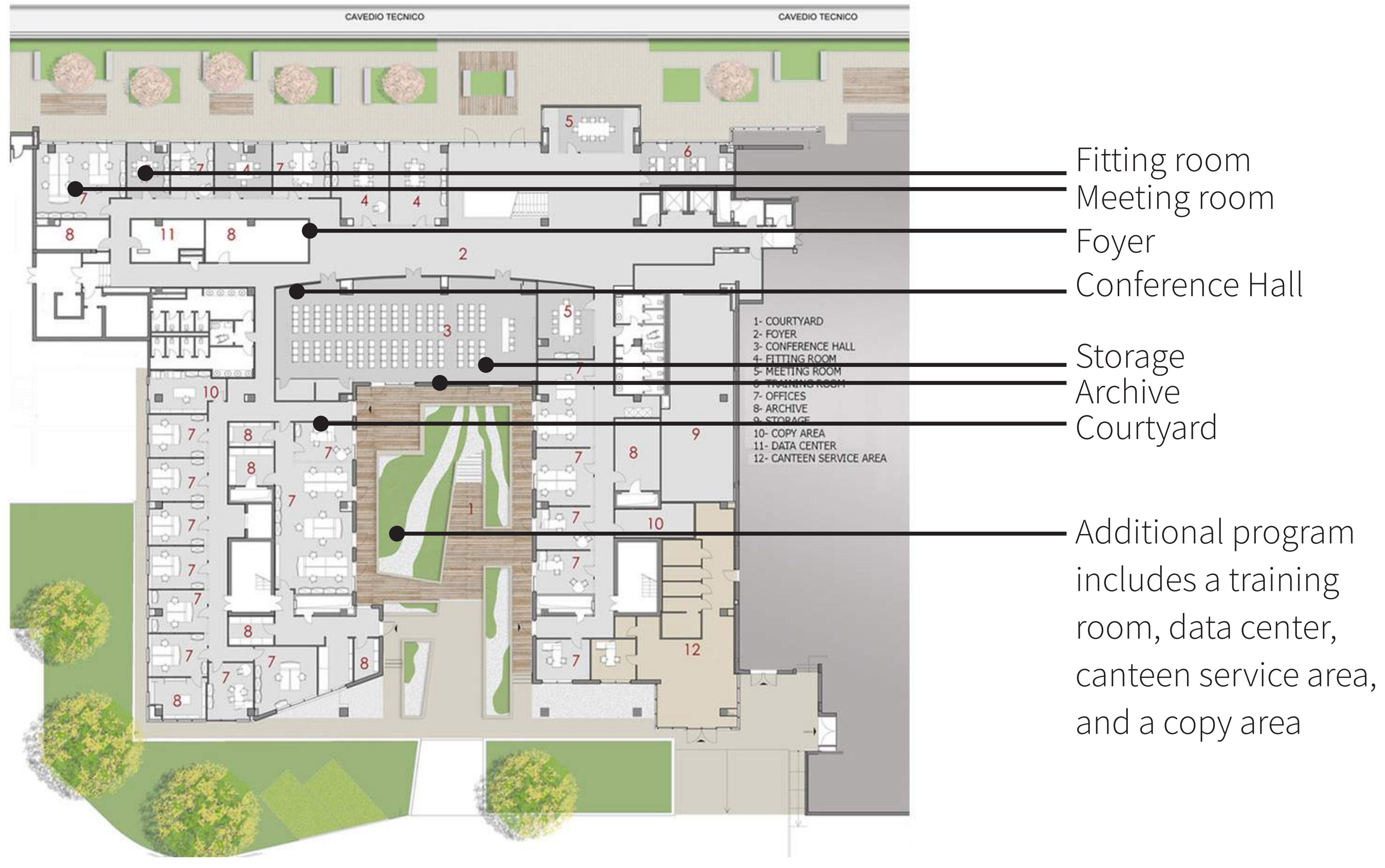


Figure_3.20 Gucci Headquarters

Potentials to Proposed Program

Prada Building
Having a multifaceted shape derived form surrounding context could allow it to stand out yet connect and enrich the community. With the addition of public spaces, the project could become a meeting point not just for fashion enthusiasts.

Fondation Louis Vuitton
Allowing for nature to be incorpoated into the program will greatly bring back the life of what once was an enriching parkland. Establishing view lines to the process of textile through the fashion industry as pathways could greatly impact the user experience and consumer actions just as the fondation did for the park Designing the project to be engaging with the user not just through the interior but the exterior as well.

Gucci Headquarters
Finding ways to implement sustainable performances through the use of textile waste. Playing with textile opacity in response to natural and artificial light within different spaces. The potential to reuse materials that are already on site to co-exist with the site and not start from scratch.

04

Program & Site

/programa y sitio/

4.0 Program

The program that will best suit the integration of design parameters for the community would be a fashion house.
A Fashion House can create various programmatic opportunities that can enrich the community and serve as a precedent to other fashion houses and schools.

[ARCHITECTURE GOALS]

-Promote Sustainability

-Promote equality

-Experiential

-Informative

[PROGRAM GOALS]

-Social Impact

-Promote Learning

-Promote Wellness

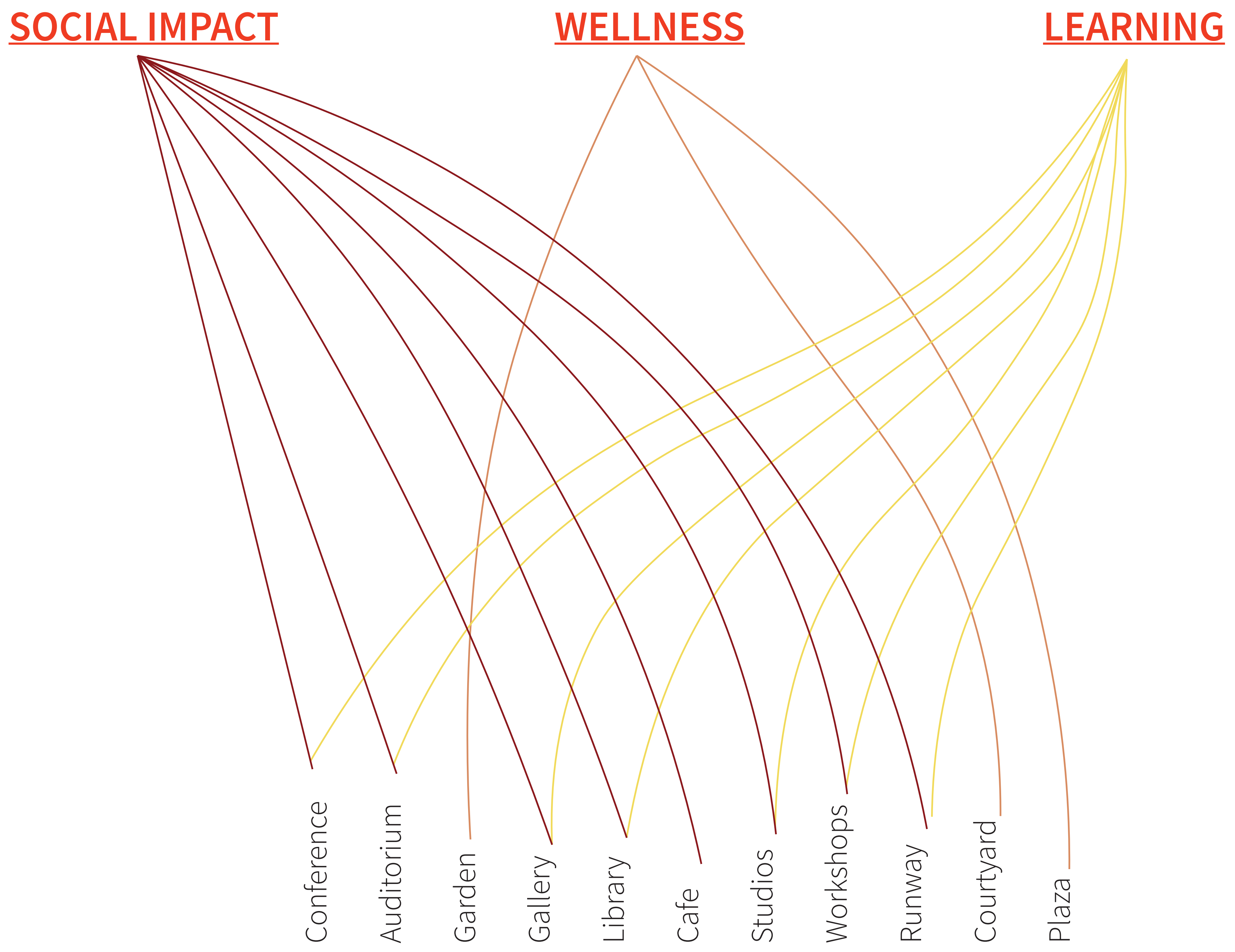


Figure_4.0 Program Goal Matrix

4.1 Site Considerations

When considering possible locations for the selected site, four parameters were taken into consideration to narrow the scope. The four parameters focus on prioritizing the site to be a design that not only provides a solution to the problem but also serves as a precedent for a more sustainable cycle in the textile and construction industry.

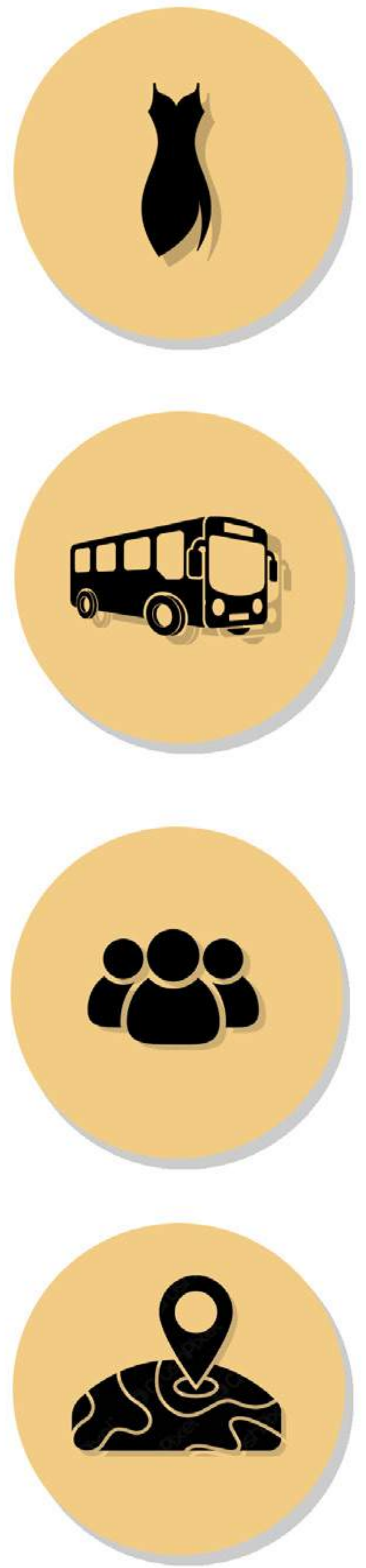
[APPLICATION OF ARCHITECTURE]

-Fashion Hub

-Close to Transporation

-Need for Community Enrichment

-Underutilized Site



FASHION HUB
Landmark for fashion

CLOSE TO TRANSPORTATION
Maximize accessibility

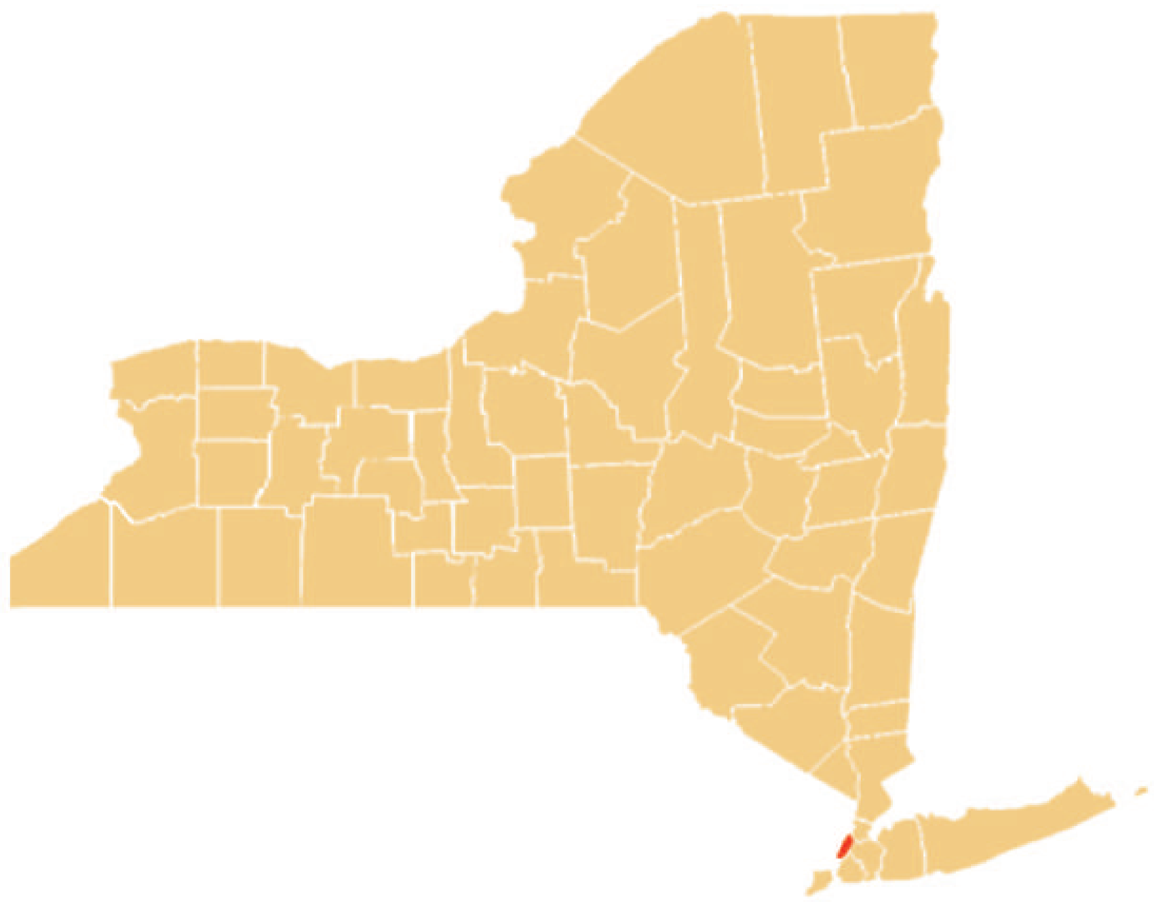
NEED FOR COMMUNITY ENRICHMENT
Lacking safe and public spaces

UNDERUTILIZED SITE
Struggling narrow sliver of urban parkland

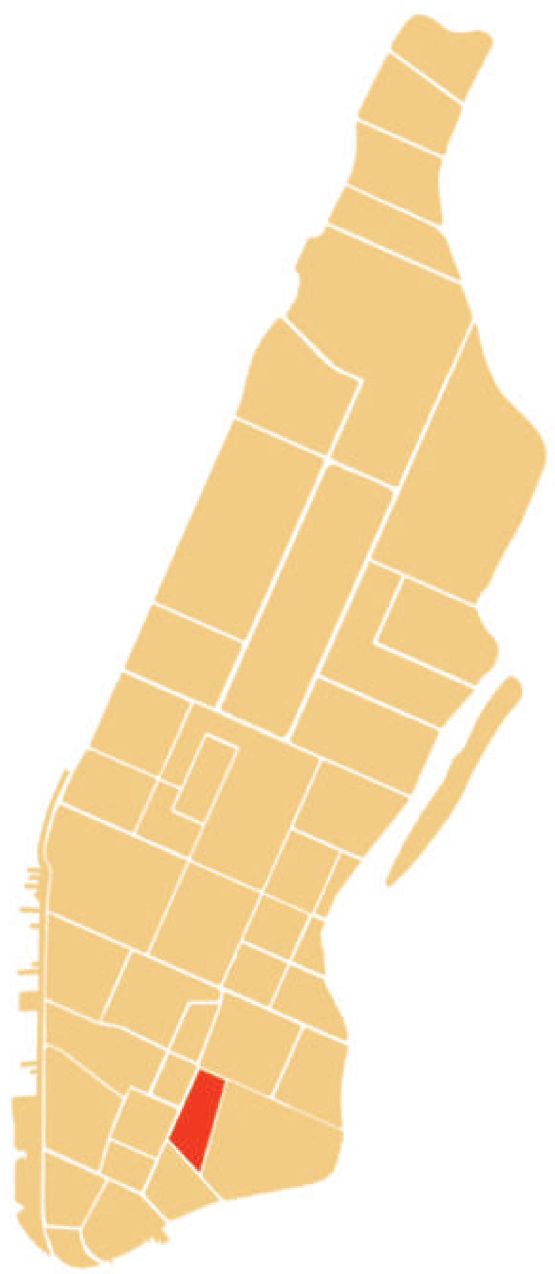
Figure_4.1 Site Considerations

4.2 Site Location

New York

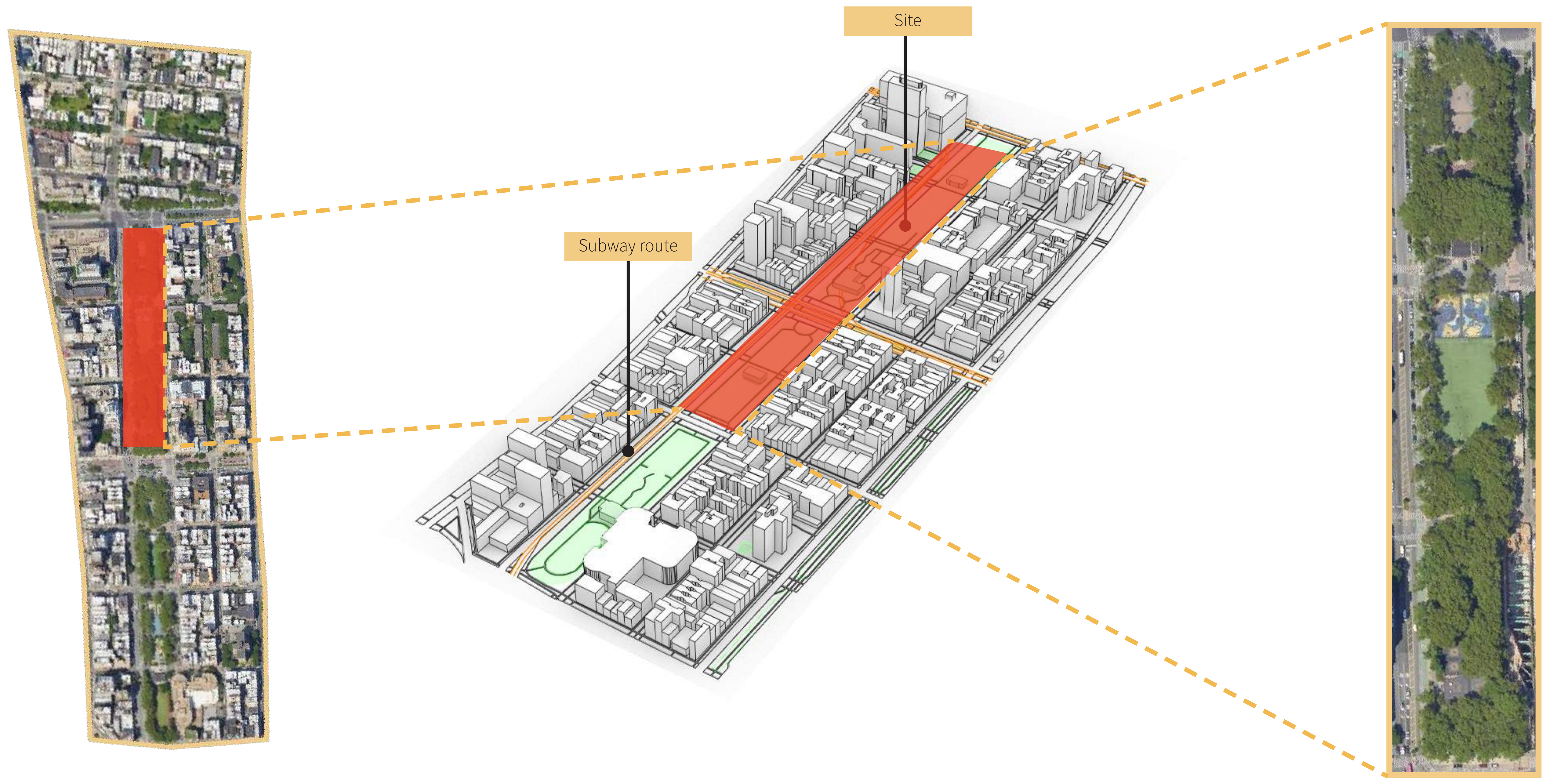


Manhattan



Bowery

9Figure_4.2 Bowery Location



Sara D. Roosevelt Park

Site

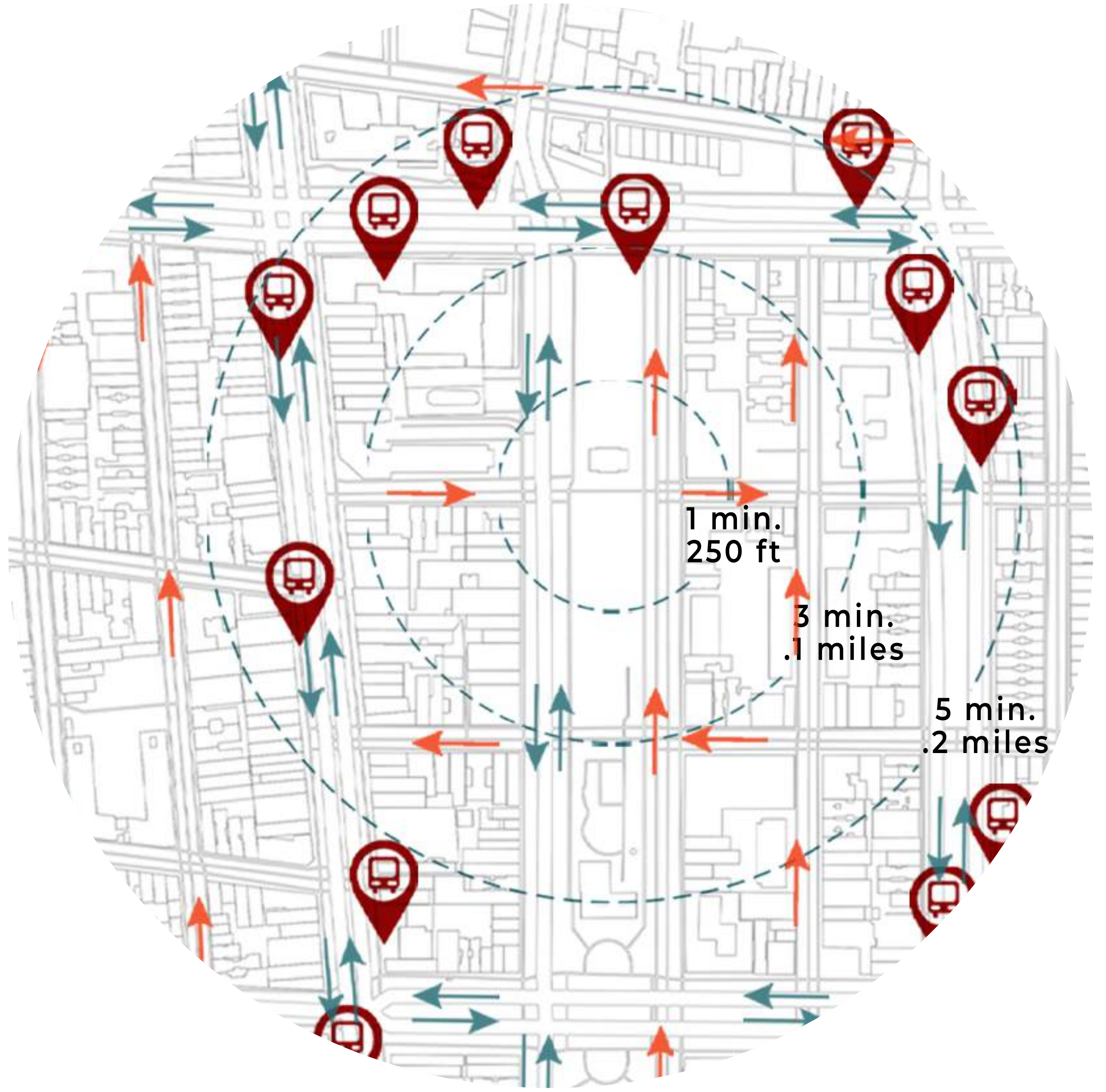
Figure_4.3 Sara D. Roosevelt Park

4.3 Site Analysis

The site is easily accessible to the public as there are multiple bus stops within walking distance and the surrounding sidewalks are also bicycle friendly. The site itself has a lot of trees as it is a park. Towards the center of the site there is a facility which is not being utilized anymore, previously it was used for park management purposes. Surrounding the site there is a lot of density and a variety of nodes which keep the surrounding site active even in the night time.

Vegetation

Flow of traffic & Bus stops



Education, Landmarks, Nodes, Bicycle routes

Figure_4.4 Site Analysis Diagrams

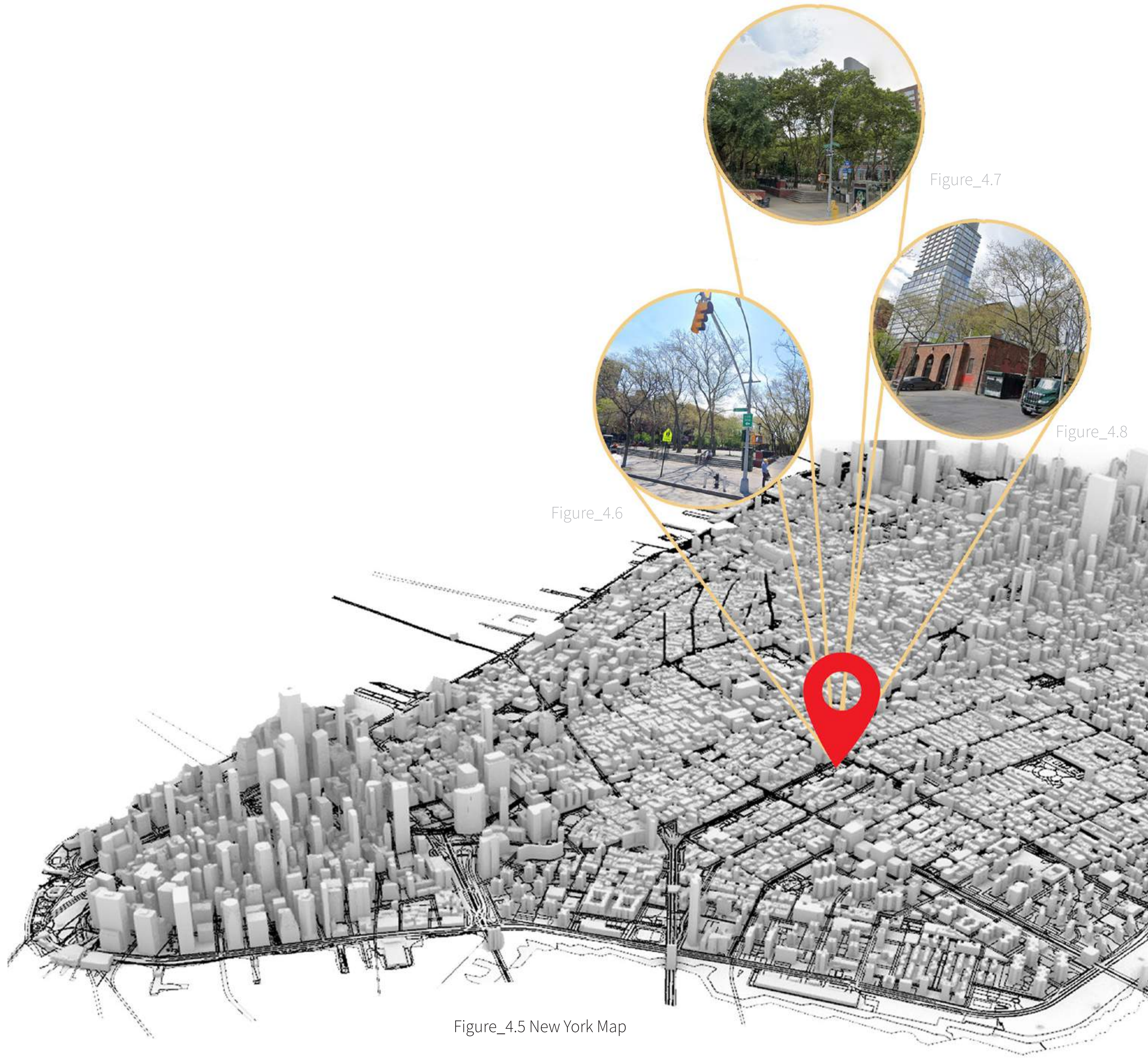


Figure_4.5 New York Map

4.4 Site Context

Materiality of the surrounding context consists of asphalt, concrete, brick and a lot of glass. Throughout the year the majority of wind come from the West averaging between 8.3 mph to 10.3 mph. Additionally, it is evident the surrounding buildings and the road network act as a boundary as the current site does not have any development that is being efficiently utillize.

200,000 TONS
THE AMOUNT OF TEXTILE WASTE IN NY

17 SCHOOLS
FASHION SCHOOLS IN MANHATTAN

16 BUS STOPS
LESS THAN 10 MINUTES AWAY FROM THE SITE

$25,361 DOLLARS
THE ANNUAL MEDIAN INCOME

Figure_4.9 Site Demographics

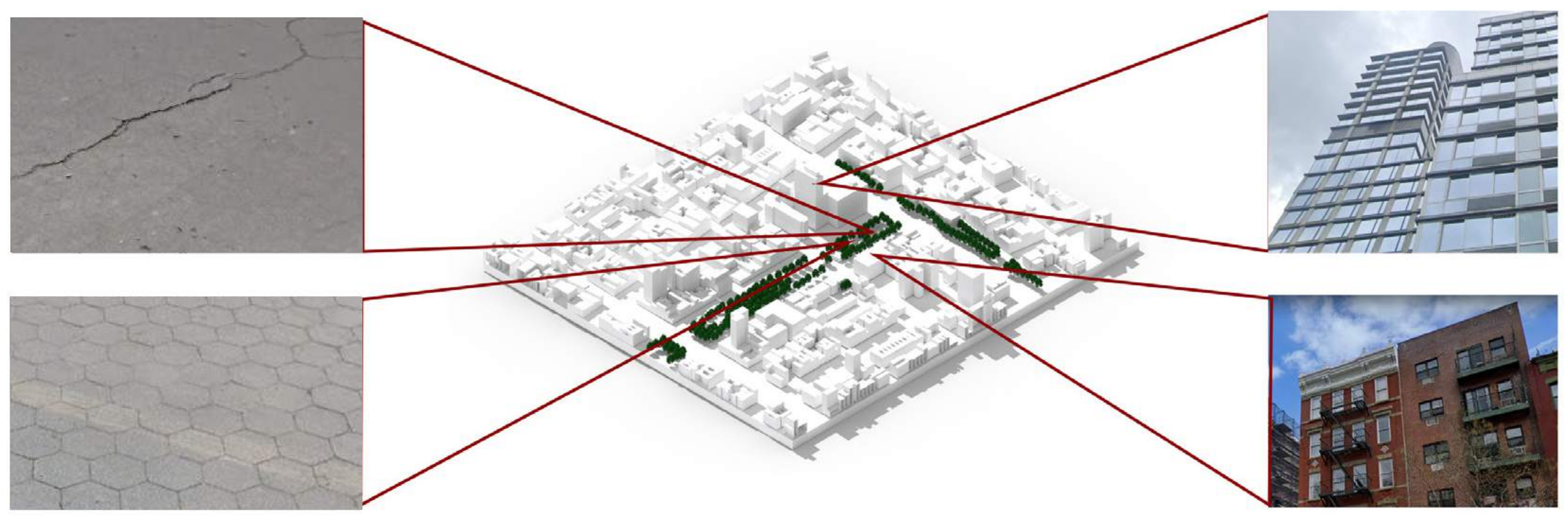


Figure_4.10 Site Materiality

Figure_4.11 Site Context

Site throughout the year remains to continue to receive sunlight. Consideration of the surrounding context in regards to height was a factor in determining the projects height as both adjacent sides of the site have differing heights. The left (NW) side of the site had buildings towering up to 291 ft while the right side (NE) had a maximum of 82 ft in height.

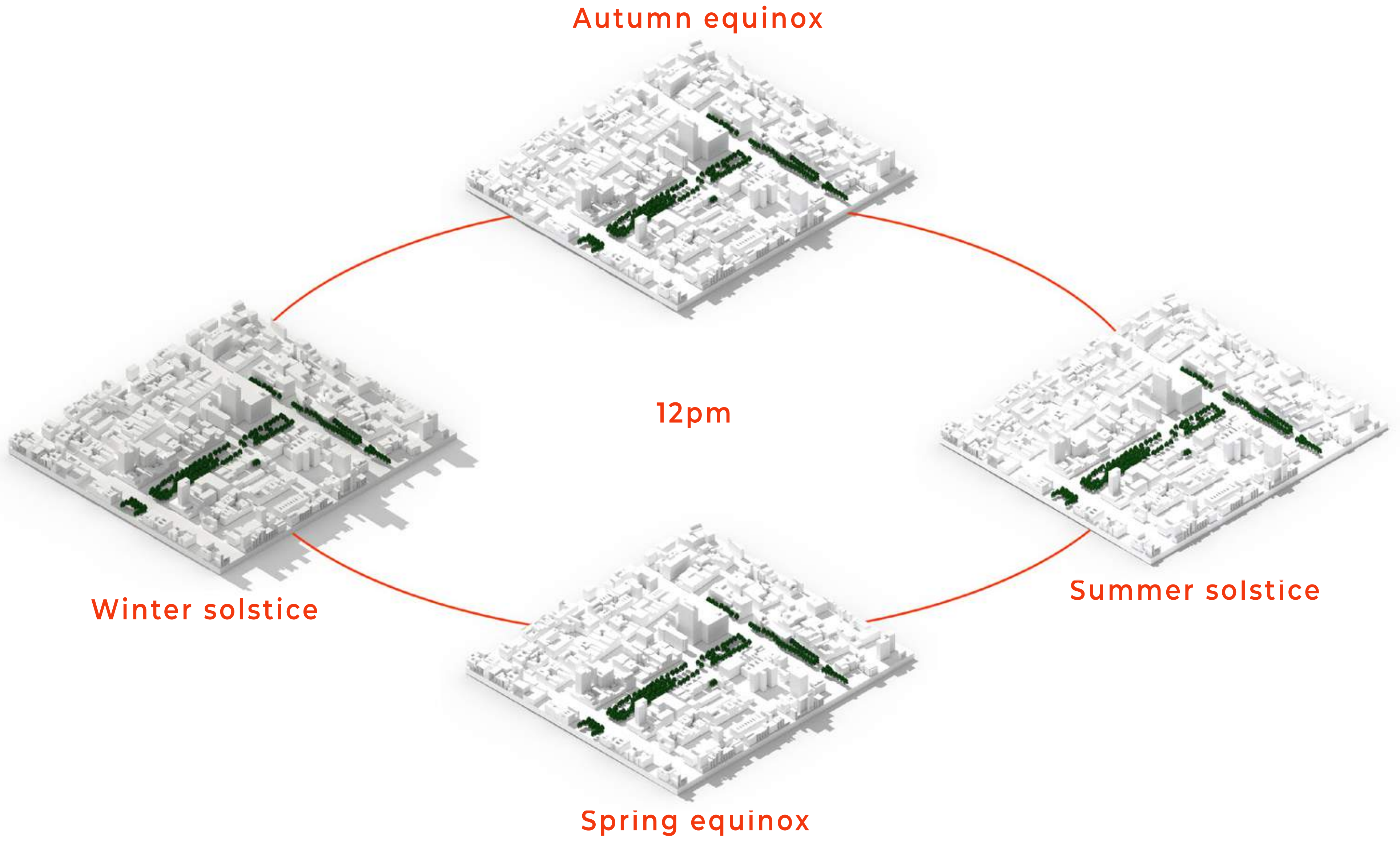


Figure_4.12 Site Solstices

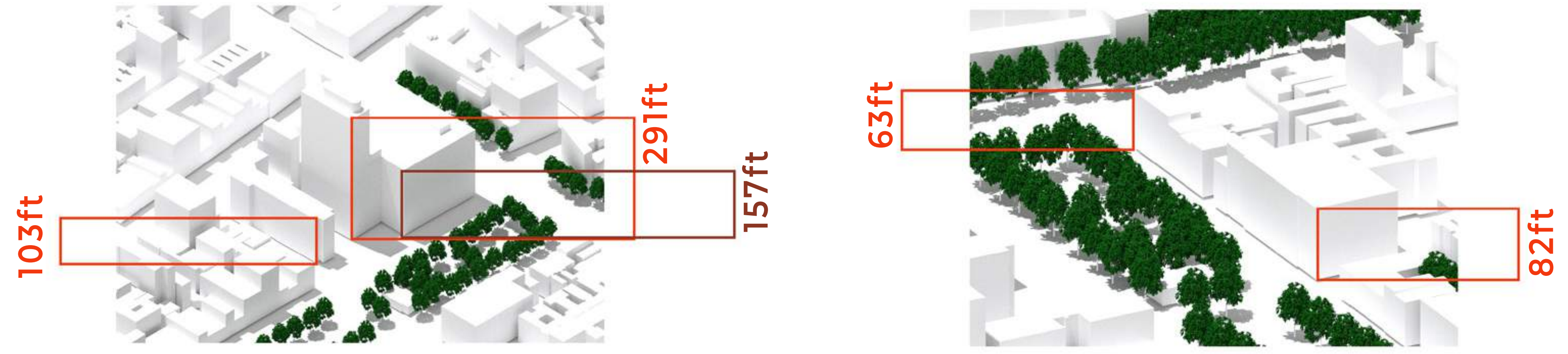


Figure_4.13 Surrounding Building Heights

05

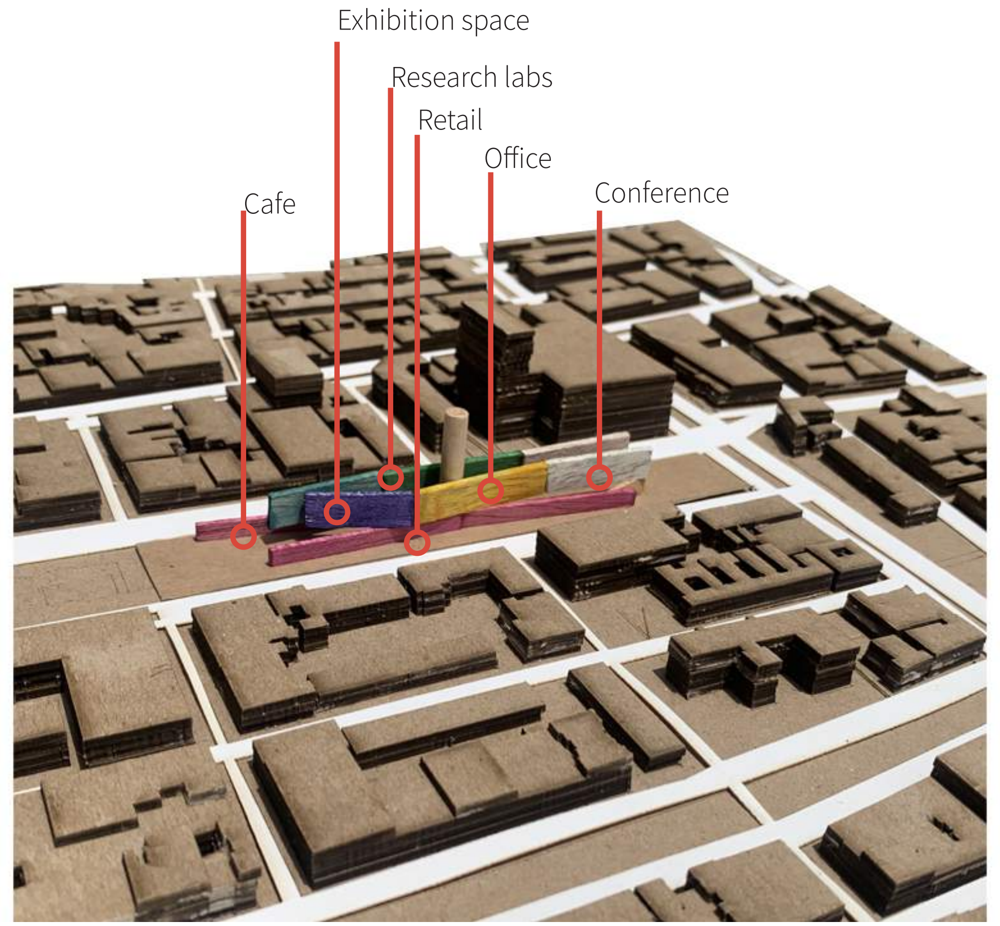
Design

/diseño/

5.0 Physical Studies

Studies were conducted to try to incorporate movement within elevations and roof plans. First two studies consisted of wood dowels to try to see if that free flowing movement of clothing could be made with rigid pieces. The following studies were conducted with the use of paper and and different bending and folding techniques.

The figure below showcases the beginning of spatial programming within the site.



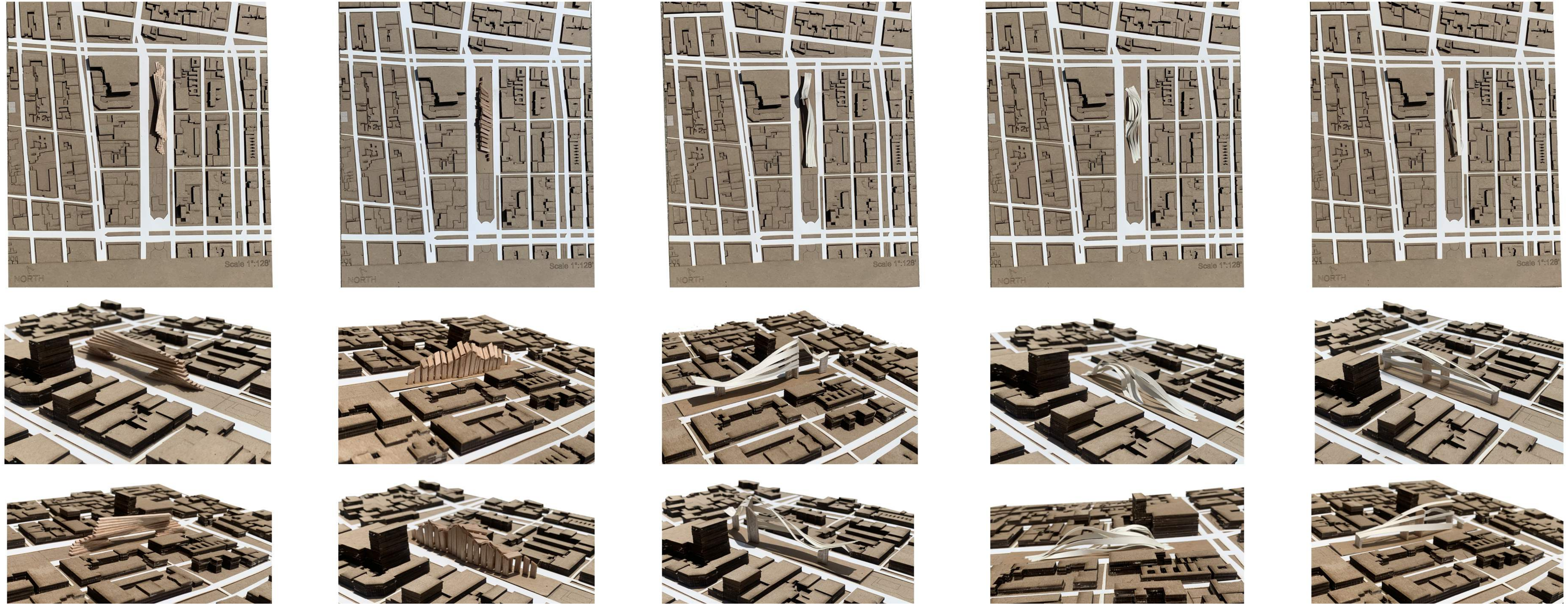


Figure_5.0 Physical Studies

5.1 Form Development

Form was inspired by the way clothing hugs and shapes a body. Additionally, there needed to be a connection towards the center in order to connect the fashion enthusiasts coming from the north and the park goers coming from the south. Curves were defined while still allowing room within the interior for programmatic spaces.

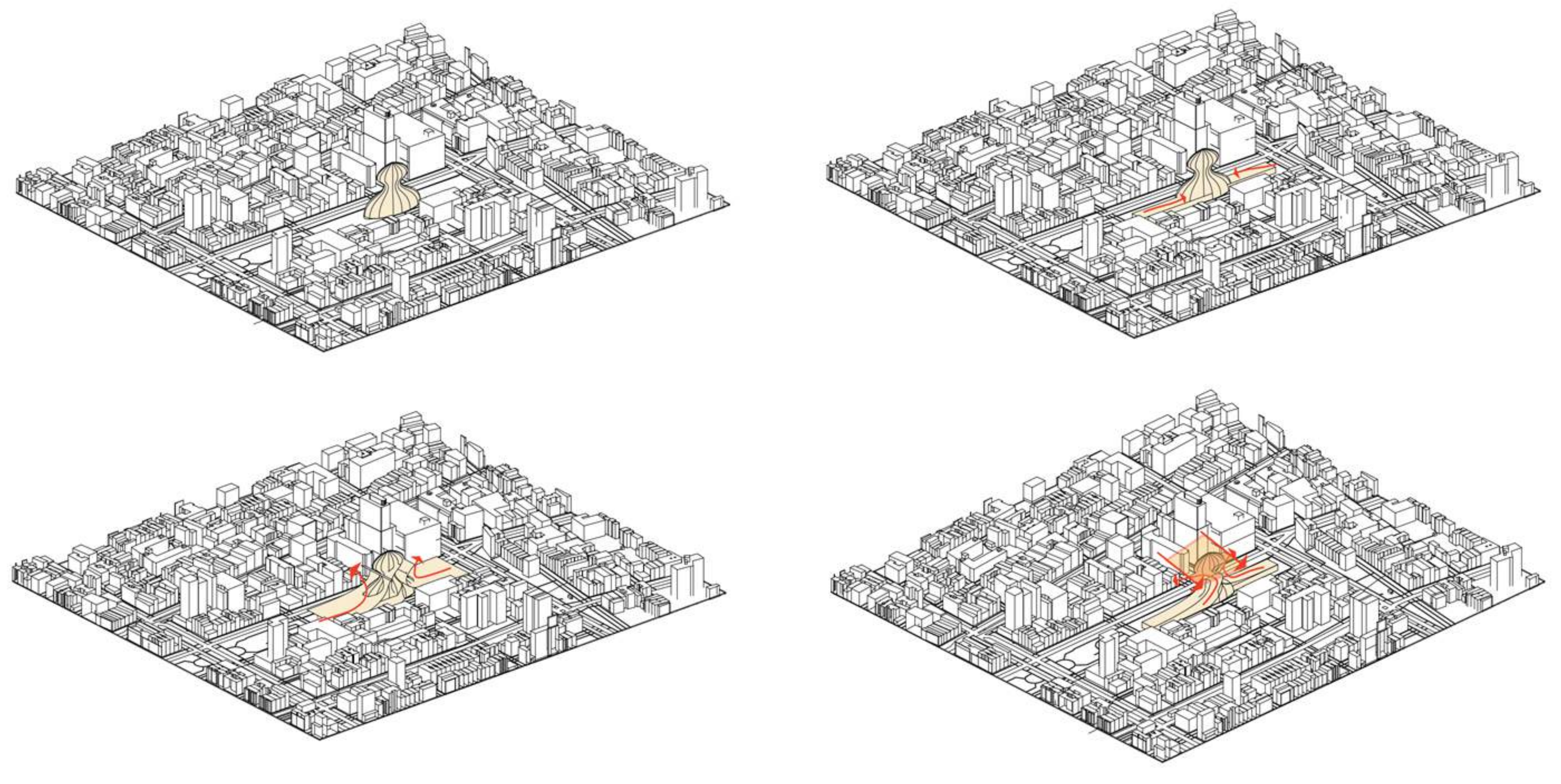


Figure_5.1 Form Development

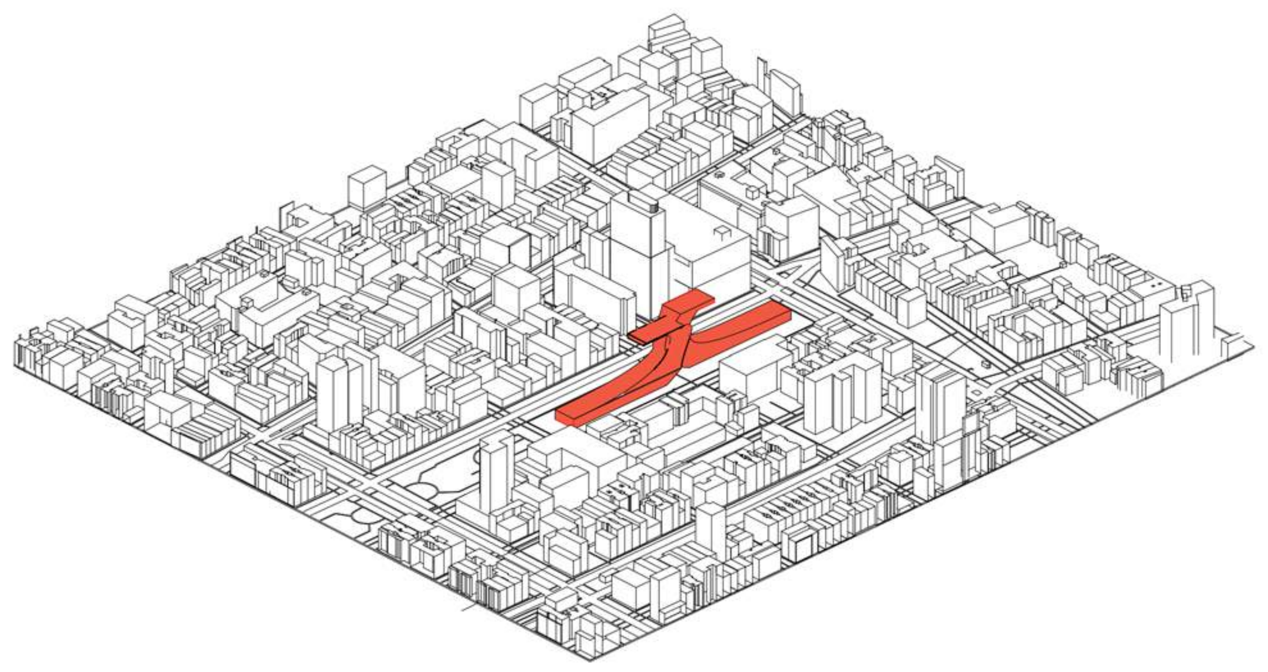


Figure_5.2 Final Shape

5.2 Spatial Program

Spatial pogram was a combination of all precedents that were studied which allows for the public as well as fashion enthusiats to have a a space they feel belonging in. Park goers may want to take a break and enjoy the cafe while fashion enthusisats have all the necessities in one building from exhibition space to research labs.

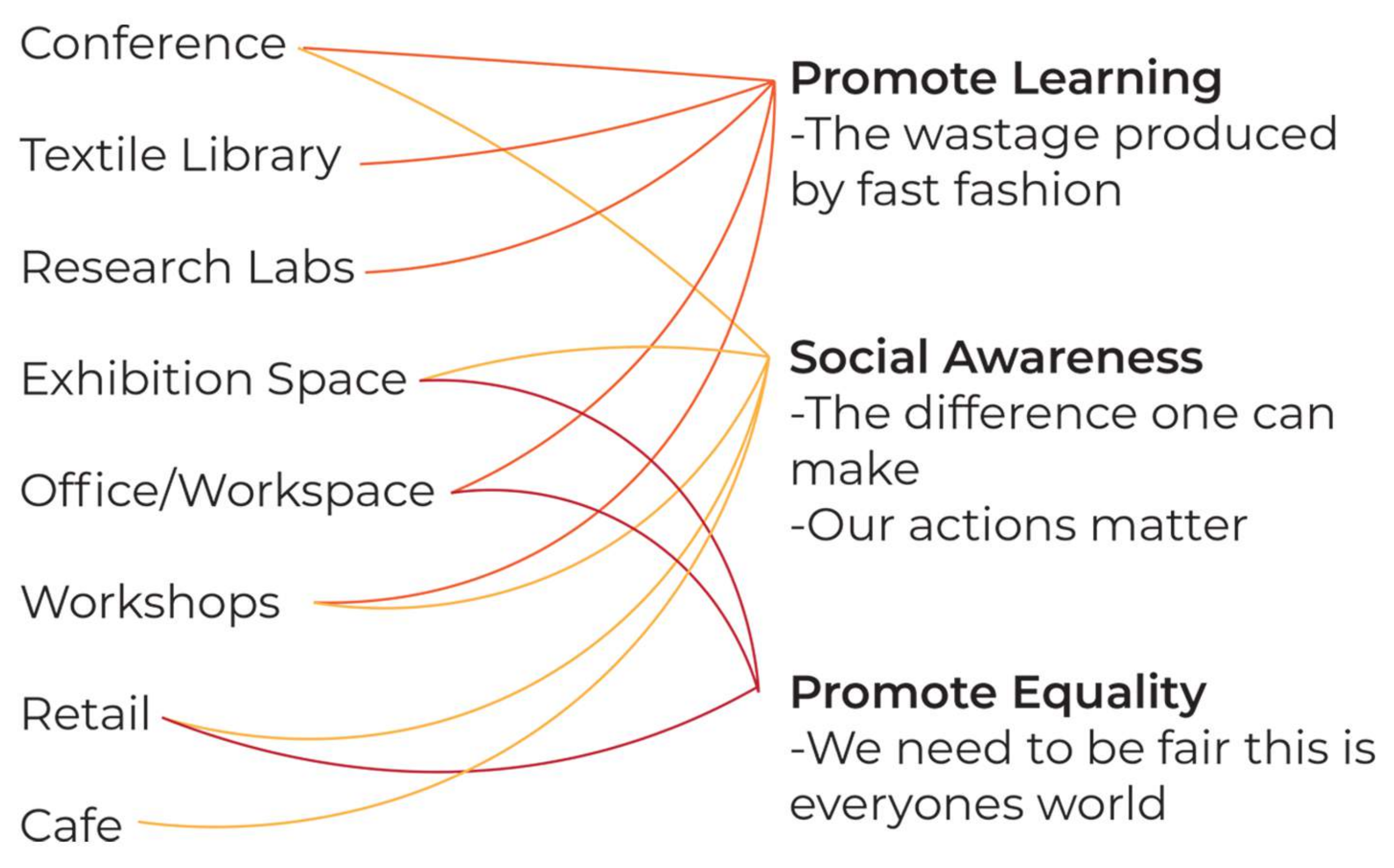


Figure_5.4 Program Matrix

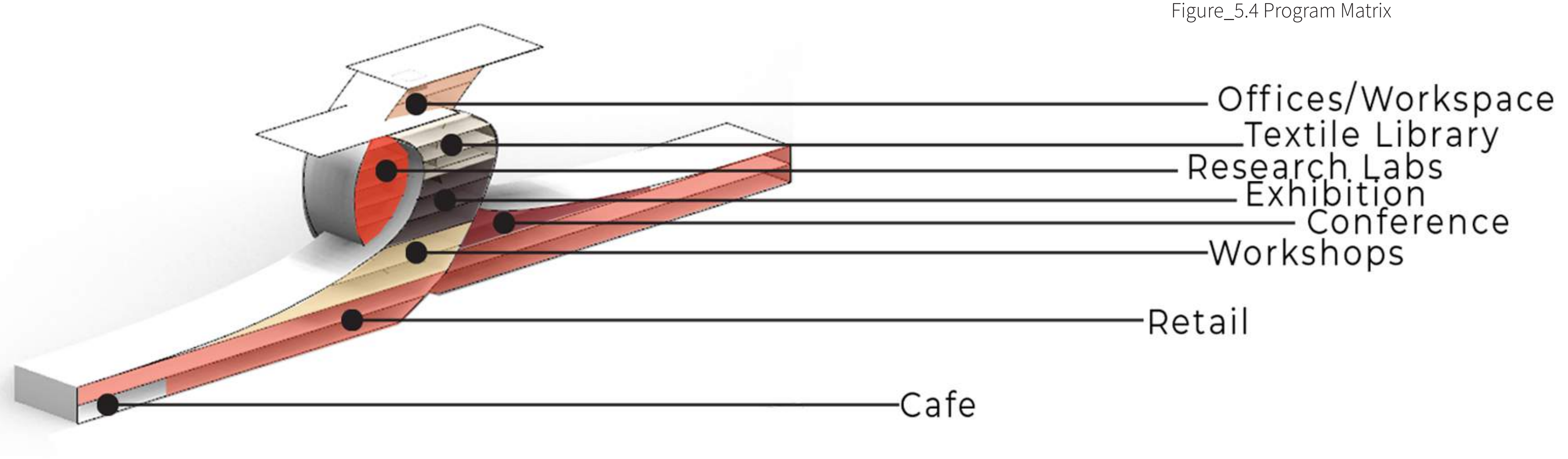


Figure_5.3 3D Spatial Program

5.3 Site Plan

Figure_5.5 Site Plan

Figure_5.6 Section

Section A

Figure_5.7 Left Elevation

Left Elevation

Figure_5.8 Right Elevation

Right Elevation

5.4 Floor Plans

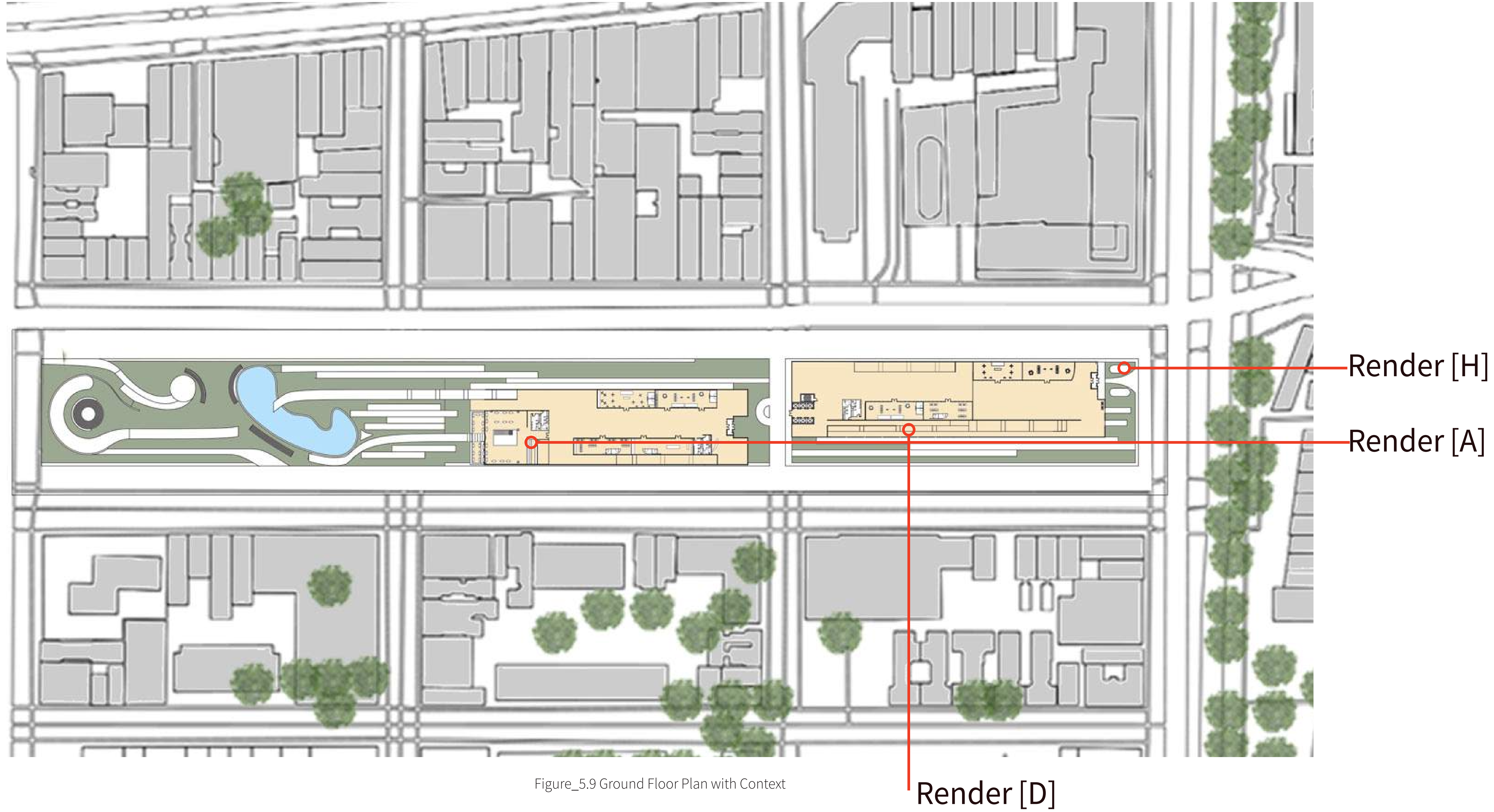


Figure_5.9 Ground Floor Plan with Context

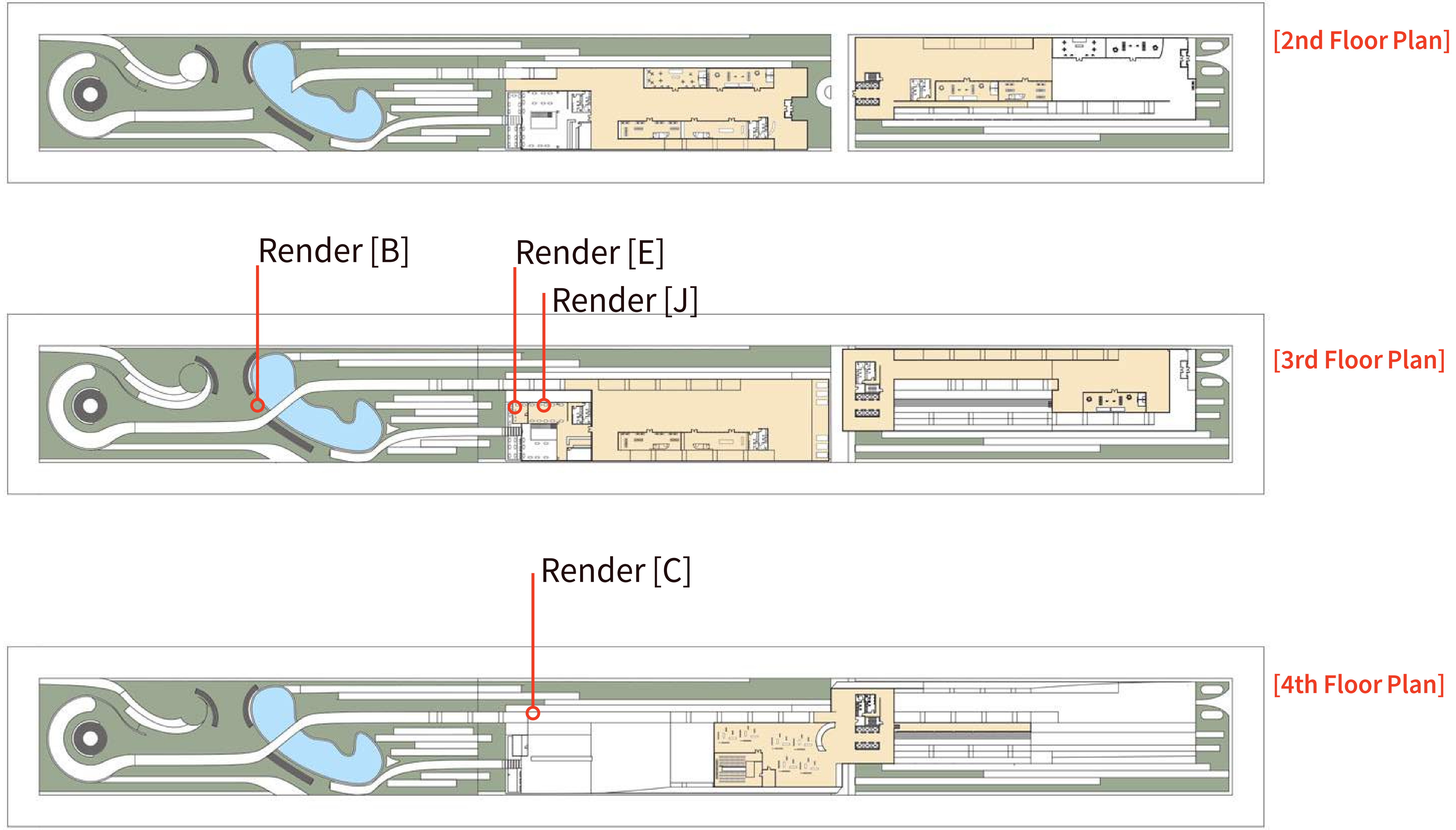


Figure_5.10 Floor Plans 1-3

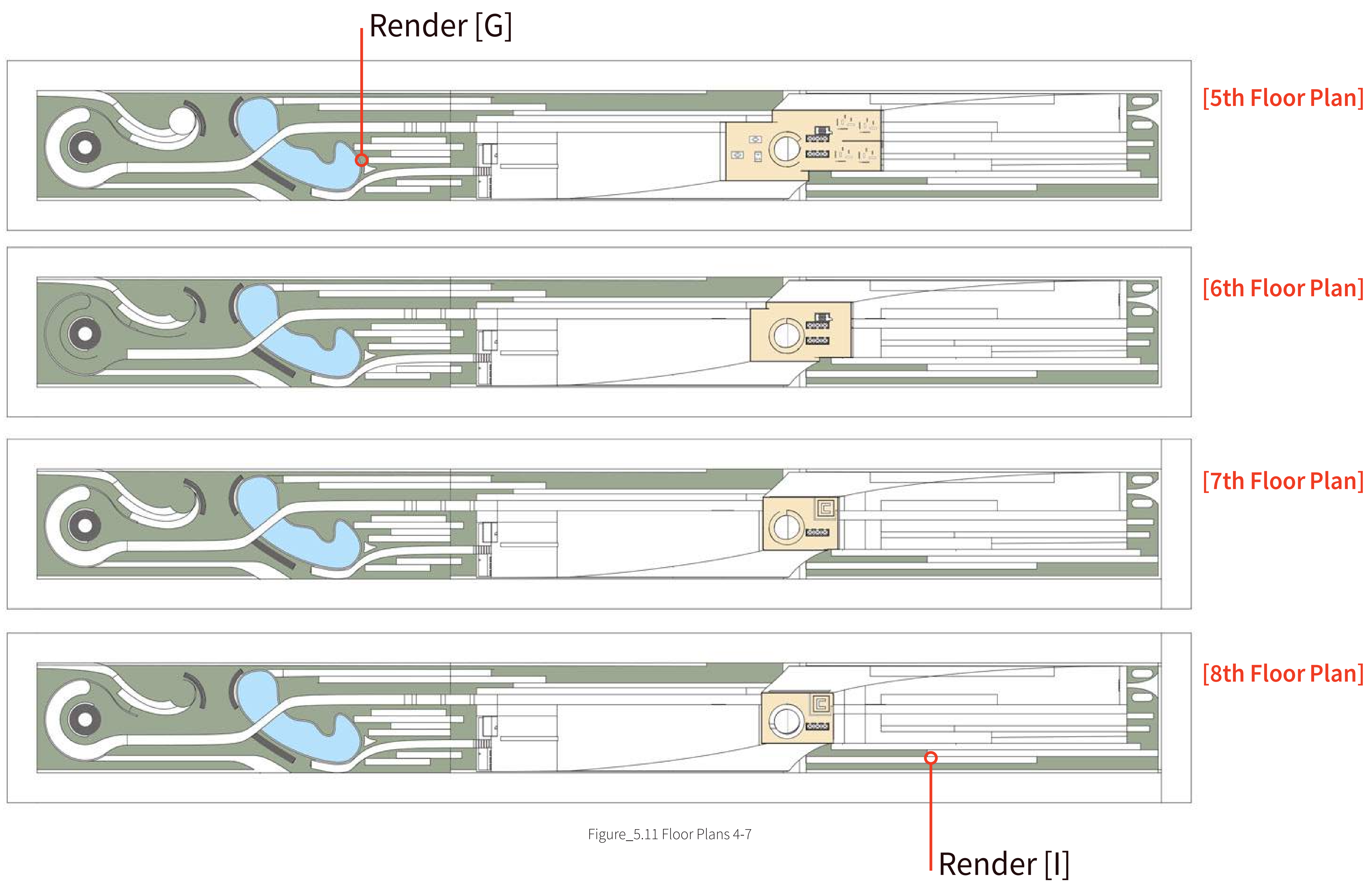


Figure_5.11 Floor Plans 4-7

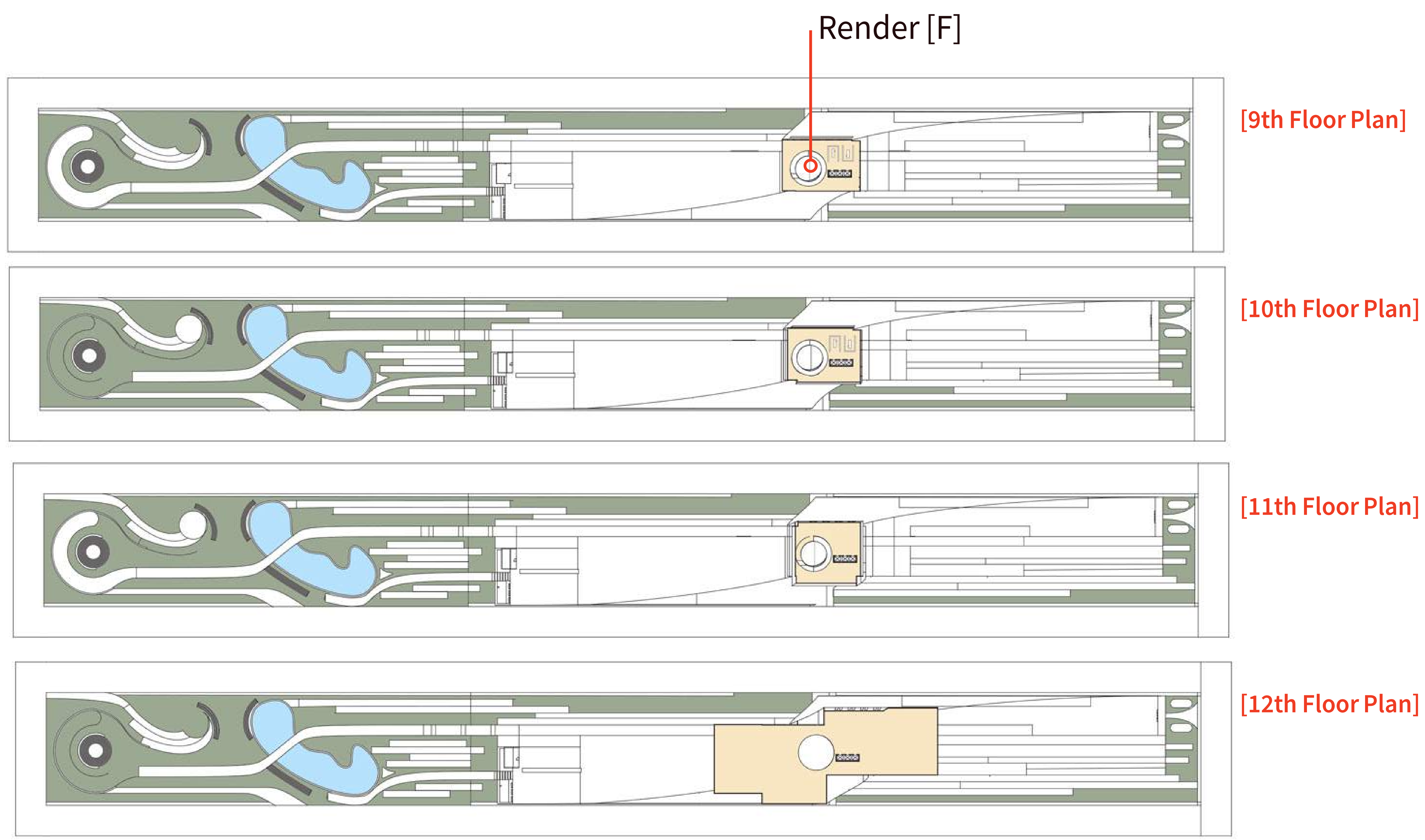
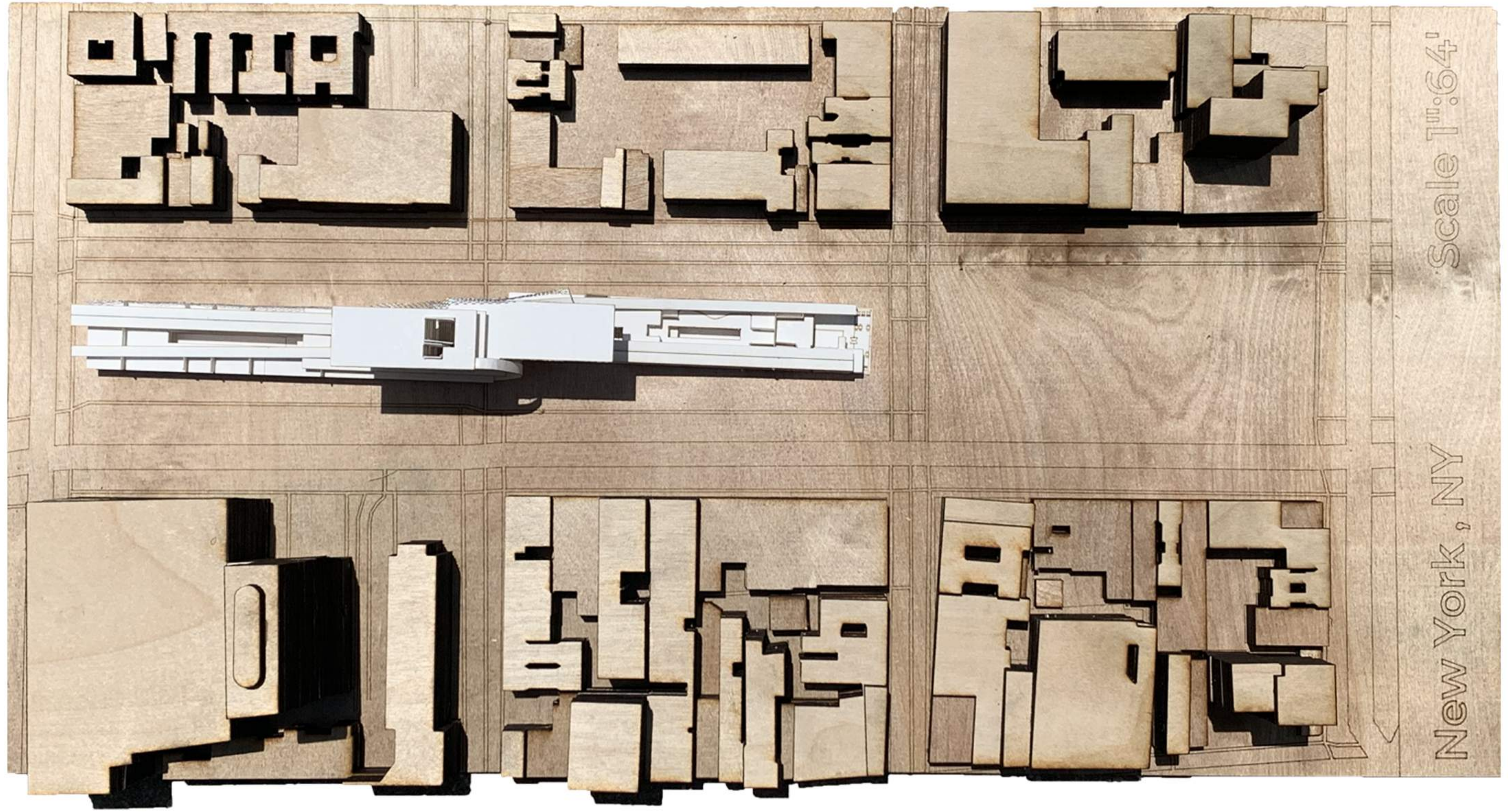
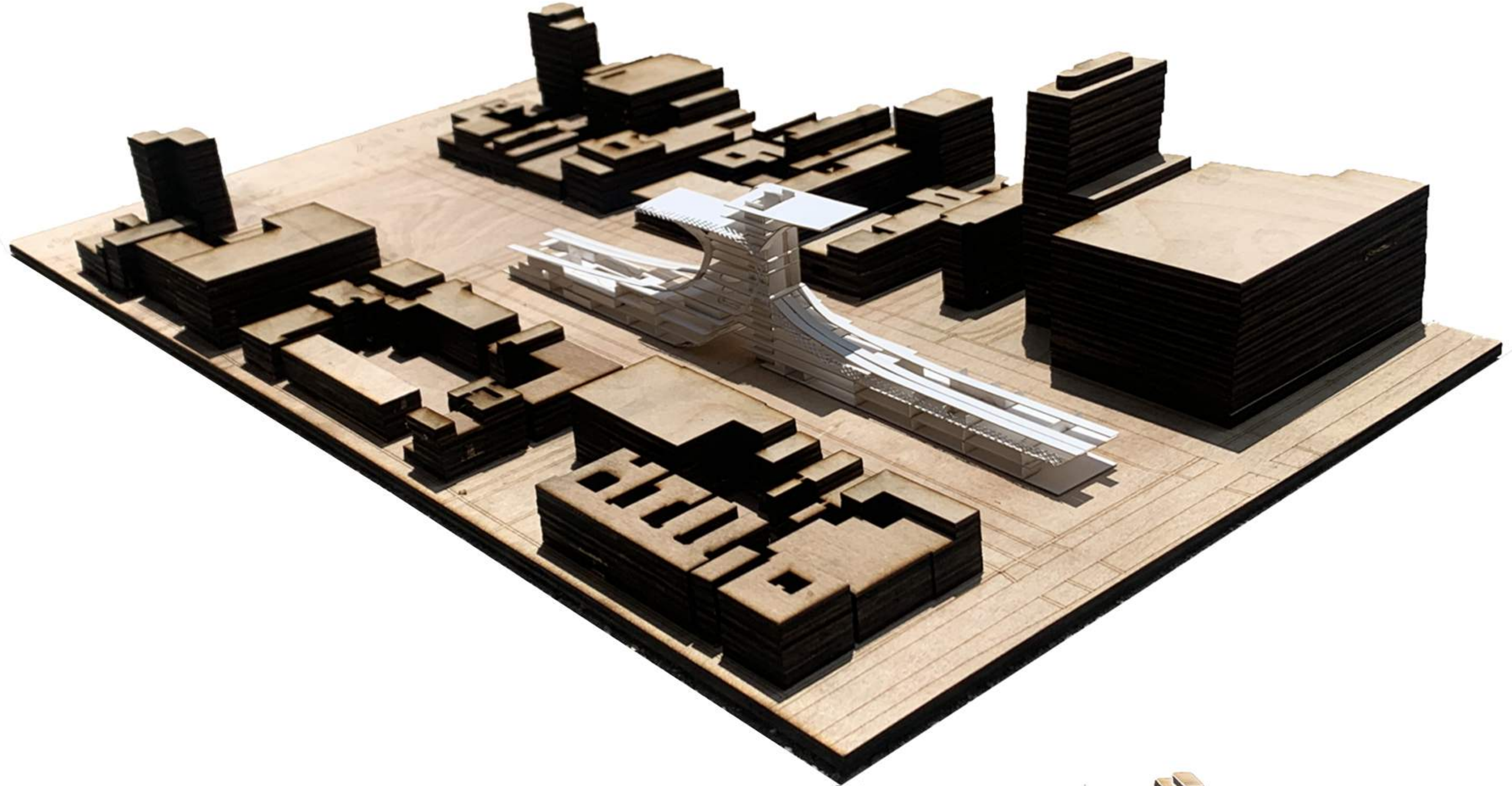


Figure_5.12 Floor Plans 8-11

5.5 Final Model





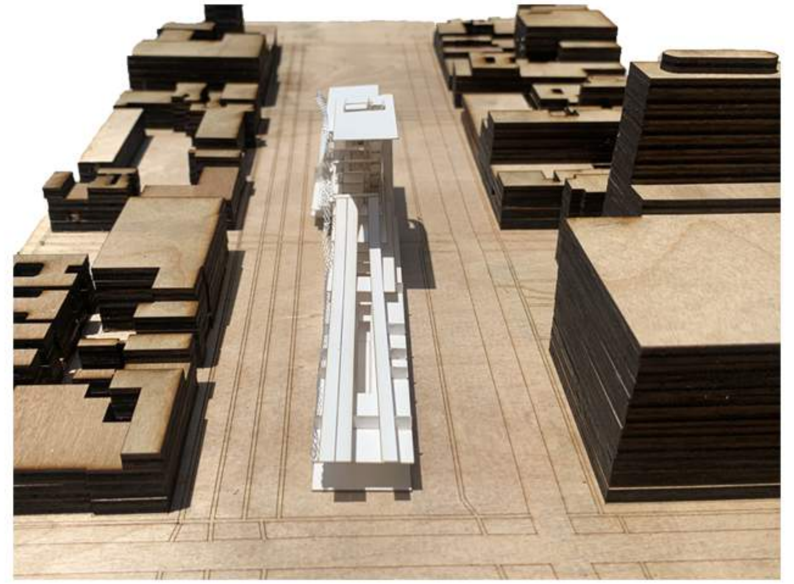


Figure_5.13 Final Model

Figure_5.14 Cafe interior Ground Level

[Materiality]

Window panes constructed out of acyrlic to lower costs and limit the amount of light getting into spaces.

Sculptural fabric art pieces are continued research projects testing the workability of the textiles Rayon and Nylon. Nylon allows for indirect light to reach the interior of the Fashion House.

Railing for the exterior runway ramps are made of Acrylic as a safe alternative to glass.

Runway ramps extend into the garden providing continuous flow into and out of the Fashion House.

Precast panels allow for the reuse of the brick from the existing building that was once on the park while also allowing for the use of glass fiber reinforced polyester in the cementious mixture.

Figure_5.15 Garden Overlooking Runway Ramps

Figure_5.16 Exterior Runway Ramps

Figure_5.17 Interior Runway

Figure_5.18 View from Third Floor Cafe

[F]

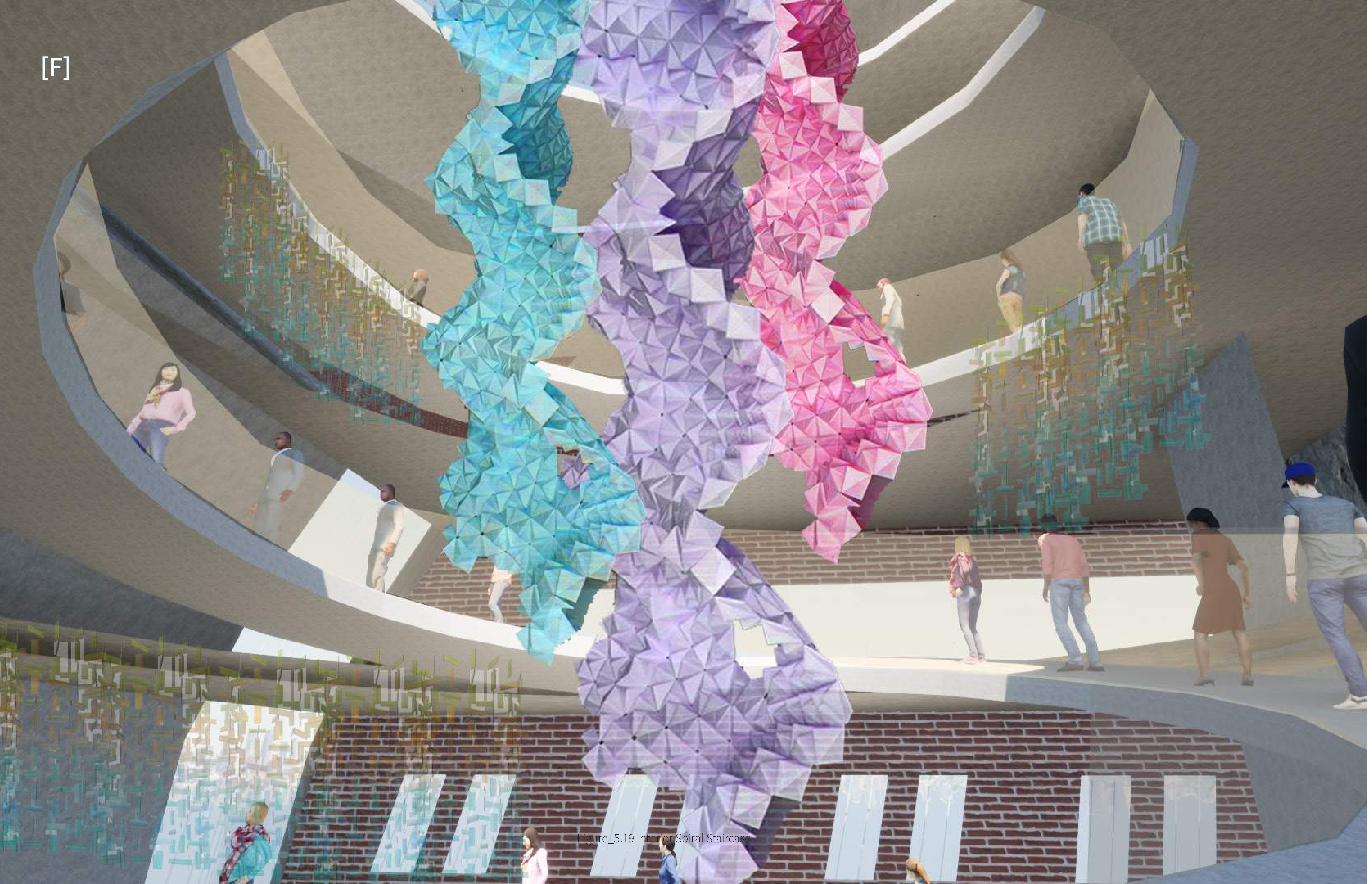


Figure_5.19 Interior Spiral Staircase

[Materiality]

Sculpture in the center of the spiral staircase will always have some percentage of nylon as it allows for some reflection to reach areas that don't get direct sunlight.

All cementious mixtures will have .2% or less than of rayon as that is the optimal percentage to reduce cracks within the concrete.

Pre-existing brick used from the site will be cut in half to add into precast panels allowing for the maximum usage of the brick on the exterior facade.

All vegetation that was removed for construction will be replanted on site in the garden as well as around the building to reduce heat gain.

[G]

Figure_5.20 Exterior rear Perspective

[H]

Figure_5.21 Exterior Front Perspective

06

Response

/respuesta/

6.0 Conclusions

With the rapid increase of the population in the U.S. the mass production of clothing will only keep increasing exponentially. This design aims to provide a sustainable solution to the tons of textile waste that New York throws away. The design aims to recycle the most common textiles found in fast fashion and incorporates them in the construction process to provide the fashion community as well as the public a space to learn about sustainable alternatives, design sustainable fashion, and even aims to attract the surrounding population. The layout of the design connects both fashion enthusiasts coming from the Northwest and the park goers from the Southwest. The continuous flow incorporated through runway ramps allows the site to be even more pedestrian friendly by creating the bridge between both far ends of the site.


[I]

Figure_6.0 Exterior Front Perspective


[J]

Figure_6.1 Interior Cafe Perspective

6.1 Appendix | B / Bibliography

[Book + Literature]

Ghassan H. Abdul Majid, Salah Albermany, Ahmed J. Obaid, and Laith A. Alasady. 2020. Construction: Materials Processing and Technologies. Key Engineering Materials. Switzerland: Trans Tech Publications Ltd. https://search.ebscohost.com/login.aspx?direct=true&AuthType=shib&db=nlebk&AN=2641359&site=eds-live&scope=site.

Hip Hing Construction Technology Limited (Kowloon). 2022. “Modified Polyester Fiber for Cementitious Composite and Method for Surface Treatment of the Same.” https://search.ebscohost.com/login.aspx?direct=true&AuthType=shib&db=edspgr&AN=edspgr.11292745&site=eds-live&scope=site.

Irfan, M.H. (1998). Polyesters in the construction industry. In: Chemistry and Technology of Thermosetting Polymers in Construction Applications. Springer, Dordrecht. https://doi.org/10.1007/978-94-011-4954-9_9

Johannes Cramer, and Stefan Breitling. 2007. Architecture in Existing Fabric : Planning, Design, Building. Basel: Birkhäuser. https://search.ebscohost.com/login.aspx?direct=true&AuthType=shib&db=nlebk&AN=525666&site=eds-live&scope=site.

Llorens, J. I. 2015. Fabric Structures in Architecture. Woodhead Publishing Series in Textiles: Number 165. Elsevier/ Woodhead Publishing in association with the Textile Institute. https://search.ebscohost.com/login.aspx?direct=true&AuthType=shib&db=cat06545a&AN=ken.997357513902954&site=eds-live&scope=site.

Nidhi, Rupal Arora, Monika Aggarwal, Anica Agarwal, and Eshita Babbar. 2022. “The Environmental Price of Fast Fashion.” International Journal of Applied Marketing & Management 7 (2): 6–12. https://search.ebscohost.com/login.aspx?direct=true&AuthType=shib&db=edb&AN=161368497&site=eds-live&scope=site.

Rabeb Ayed, Salwa Bouadila, Safa Skouri, Laura Boquera, Luisa F. Cabeza, and Mariem Lazaar. 2023. “Recycling Textile Waste to Enhance Building Thermal Insulation and Reduce Carbon Emissions: Experimentation and Model-Based Dynamic Assessment.” Buildings 13 (535): 535. doi:10.3390/buildings13020535.

Saadman Sakib Rahman, Sumi Siddiqua, and Chinchu Cherian. 2022. “Sustainable Applications of Textile Waste Fiber in the Construction and Geotechnical Industries: A Retrospect.” Cleaner Engineering and Technology 6 (100420-). doi:10.1016/j.clet.2022.100420.

Oluwafemi Emmanuel Ogundiji, and Grace Modupe Oyatogun. 2022. “Tensile and Flexural Properties of Polyester Composites Reinforced by Iron Filings.” Tribology and Materials 1 (4): 157–62. doi:10.46793/tribomat.2022.020.

[Online Sources]

ai_admin, ai_admin. “Applications Where Nylon Is Used.” Ai Plastics, February 28, 2020. https://www.aiplastics.com/blog/applications-where-nylon-is-used/#:~:text=Nylon%20in%20Construction,nets%2C%20plumbing%20fittings%20and%20more.

“Architecture, Building & Construction Suppliers.” Architecture & Design. Accessed May 7, 2023. https://www.architectureanddesign.com.au/suppliers/mitchell-plastics/fins-on-boutique-apartments-exterior-created-with.

Arnault, Bernard, and Frank Gehry. “The Building.” Fondation Louis Vuitton. Accessed May 7, 2023. https://www.fondationlouisvuitton.fr/en/fondation/the-building.

Arquitectura Viva. “Prada Building in Aoyama, Tokyo - Herzog & De Meuron .” Arquitectura Viva. Arquitectura Viva, November 25, 2020. https://arquitecturaviva.com/works/edificio-prada-en-aoyama-tokio-8.

Hedmond, Shane. “Inflatable Bubble Building Hopes to Improve Air and Light Quality in Polluted Shanghai.” Construction Junkie. Construction Junkie, August 5, 2015. https://www.constructionjunkie.com/blog/2015/8/4/inflatable-bubble-building-hopes-to-improve-air-and-light-quality-in-polluted-shanghai.

“Heydar Aliyev Cultural Center, Designed by Zaha Hadid Architects.” Accessed May 8, 2023. https://www.architectmagazine.com/design/buildings/heydar-aliyev-cultural-center-designed-by-zaha-hadid-architects_o.

“Nylon in Construction.” Nylon in construction - Designing Buildings. Accessed May 7, 2023. https://www.designingbuildings.co.uk/wiki/Nylon_in_construction.

Sánchez, Daniel. “24 Housing Units / Zanon + Bourbon Architects.” ArchDaily. ArchDaily, November 22, 2013. https://www.archdaily.com/450529/24-housing-units-zanon-bourbon-architects.

Valenzuela, Karen. “Gucci Headquarters / Genius Loci Architettura.” ArchDaily. ArchDaily, May 17, 2014. https://www.archdaily.com/506256/gucci-headquarters-genius-loci-architettura.

6.2 Appendix | C / Image Index

[1]

Figure_1.0 Thesis Poster

Figure_1.1 Fabrics
Igini, Martina. Mass Production. August 24, 2022. Earth.org. https://earth.org/fast-fashion-brands-greenwashing/.

Figure_1.2 Mass Production
Different Colors Fabrics. 2021. Silver Bobbin. https://silverbobbin.com/polyester-vs-cotton/.

[2]

Figure_2.0 Textile waste Management

Figure_2.1 Fast Fashion Textiles- sourced from: Google Images

Figure_2.2 Environmental Impact of Textile waste

Figure_2.3 Boutique Apt. Fins
Nylon Fins on Apartment. Architecture 7 Design. Mitchell Group, May 7, 2016. https://www.architectureanddesign.com.au/suppliers/mitchell-plastics/fins-on-boutique-apartments-exterior-created-with.

Figure_2.4 Shanghai Building
Hedmond, Shane. Inflatable Bubble Building. August 6, 2015. Construction Unkie. https://www.constructionjunkie.com/blog/2015/8/4/inflatable-bubble-building-hopes-to-improve-air-and-light-quality-in-polluted-shanghai.

Figure_2.5 Heydar Aliyev Center
Wang, Lucy. Heydar Aliyev Center. July 6, 2014. Inhabitat. https://inhabitat.com/zaha-hadids-heydar-aliyev-center-in-baku-wins-design-of-the-year/.

Figure_2.6 24 Housing Units
24 Housing Units. Arch Daily. Zanon + Bourbon Architects, November 22, 2013. https://www.archdaily.com/450529/24-housing-units-zanon-bourbon-architects.

[3]

Figure_3.0-3.5 Prada Building
Prada Building in Aoyama, Tokyo . 2010. Arquitectura Viva. https://arquitecturaviva.com/works/edificio-prada-en-aoyama-tokio-8#.

[3]

Figure_3.6-3.11 Fondation Louis Vuitton
Partners, Gehry. Fondation Louis Vuitton. October 13, 2014. Arch Daily. https://www.archdaily.com/555694/fondation-louis-vuitton-gehry-partners.

Figure_3.12-3.17 Gucci Headquarters
Gucci Headquarters. 2014. Arch Daily. https://www.archdaily.com/506256/gucci-headquarters-genius-loci-architettura.

Figure_3.18 Prada Building Section
Prada Building in Aoyama, Tokyo . 2010. Arquitectura Viva. https://arquitecturaviva.com/works/edificio-prada-en-aoyama-tokio-8#.

Figure_3.19 Fondation Louis Vuitton
Partners, Gehry. Fondation Louis Vuitton. October 13, 2014. Arch Daily. https://www.archdaily.com/555694/fondation-louis-vuitton-gehry-partners.

Figure_3.20 Gucci Headquarters
Gucci Headquarters. 2014. Arch Daily. https://www.archdaily.com/506256/gucci-headquarters-genius-loci-architettura.

[4]

Figure_4.0 program Goal Matrix

Figure_4.1 Site Considerations

Figure_4.2 Bowery Location

Figure_4.3 Sara D. Roosevelt Park

Figure_4.4 Site Analysis Diagrams

Figure_4.5 New York Map

Figure_4.6-4.8 Sourced from: Google Images

Figure_4.9 Site Demographics

Figure_4.10 Site Materiality

[4]

Figure_4.11 Site Context

Figure_4.12 Site Solstice

Figure_4.13 Surrounding Building Heights

[5]

Figure_5.0 Physical Studies

Figure_5.1 Form Development

Figure_5.2 Final Shape

Figure_5.3 3D Spatial Program

Figure_5.4 Program Matrix

Figure_5.5 Site Plan

Figure_5.6 Section

Figure_5.7 Left Elevation

Figure_5.8 Right Elevation

Figure_5.9 Ground Floor Plan with Context

Figure_5.10 Floor Plans 1-3

Figure_5.11 Floor Plans 4-7

Figure_5.12 Floor Plans 8-11

Figure_5.13 Final Model

Figure_5.14 Cafe Interior Ground Level

Figure_5.15 Garden Overlooking Runway Ramps

Figure_5.16 Exterior Runway Ramps

Figure_5.17 Interior Runway

Figure_5.18 View fromThird Floor Cafe

[5]

Figure_5.19 Interior Spiral Staircase

Figure_5.20 Exterior Rear Perspective

Figure_5.21 Exterior Front Perspective

[6]

Figure_6.0 Exterior Front Perspective

Figure_6.1 Interior Cafe Perspective