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Southern California Institute of Architecture

2022

TABLE OF CONTENTS

Entropy: Altered Ecology

Thesis

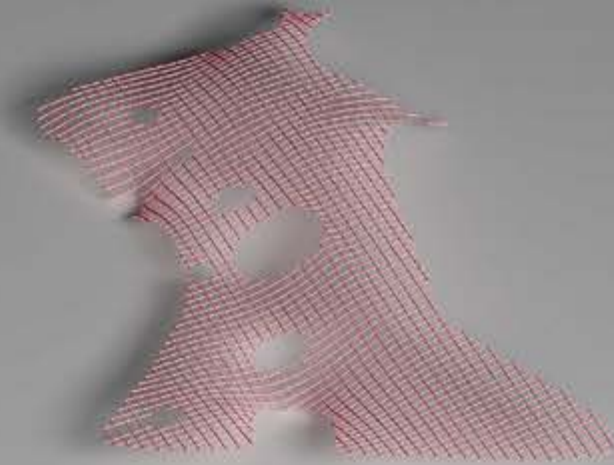
6-23



Elevation Park

Barbara G Laurie Student Design Competition Finalist

24-35



Design Documentation

Design Documentation

36-45



The National Museum of the American Latino

Vertical Studio

46-55



ENTROPY: ALTERED ECOLOGY

Thesis

Spring 2023

Instructor: Eric Owen Moss

Software/Skills: Rhino, Rhino SubD,
Maya, Unreal Engine, 3D Printing,
CNC Milling

You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete. This was spoken by R. Buckminster Fuller, architect, author, and nobel peace prize recipient. Climate change is here, it is the reality we are living in. Climates are changing, ecosystems are dying, and soon crops will be deeply impacted. This is an extreme situation that we are in and a extreme solution is required to ensure our survival. As our planet's climate continues to shift, the repercussions on agriculture, ecosystems, and food security have become increasingly evident. It is important that we explore ways of adaption, not rehabilitation. We need to build a different model to help adapt to climate change. Biodomes have emerged as a beacon of hope amidst this uncertainty. These enclosed environments offer us the unique opportunity to study and manipulate different ecosystems while ensuring their sustainability. Understanding the rationale that's needed to

implement biodomes. Iceland became the best choice. Iceland distinctive geographical and geological attributes, presents a formidable challenge in conventional agriculture due to its extreme climate. Wind speed makes it difficult for long farming seasons Only 1% of land in arable cultivation And do to this 70% of emissions come from the import, exports of food and supplies A big part is that the average sunlight lasts for 4 hours Nonetheless, food production will no longer be linear, but vertical and integrated with the ecosystems. Energy will come from Icelands abundants of natural resources including geothermal power, hydro electric dams and air turbines. By capitalizing on these geothermal resources and hot springs, controlled environments can be engineered to create optimal conditions for year-round crop cultivation and the preservation of intricate ecosystems within Iceland's unique ecological context.



Site Conditions



1% of Iceland is Arable cultivation.



Wind speed between topographical features and dust storms happen frequently make it difficult to have longer farming seasons.



70% of emissions come form imports



Average amount of sunlight per day is 4 hrs

Food on Earth



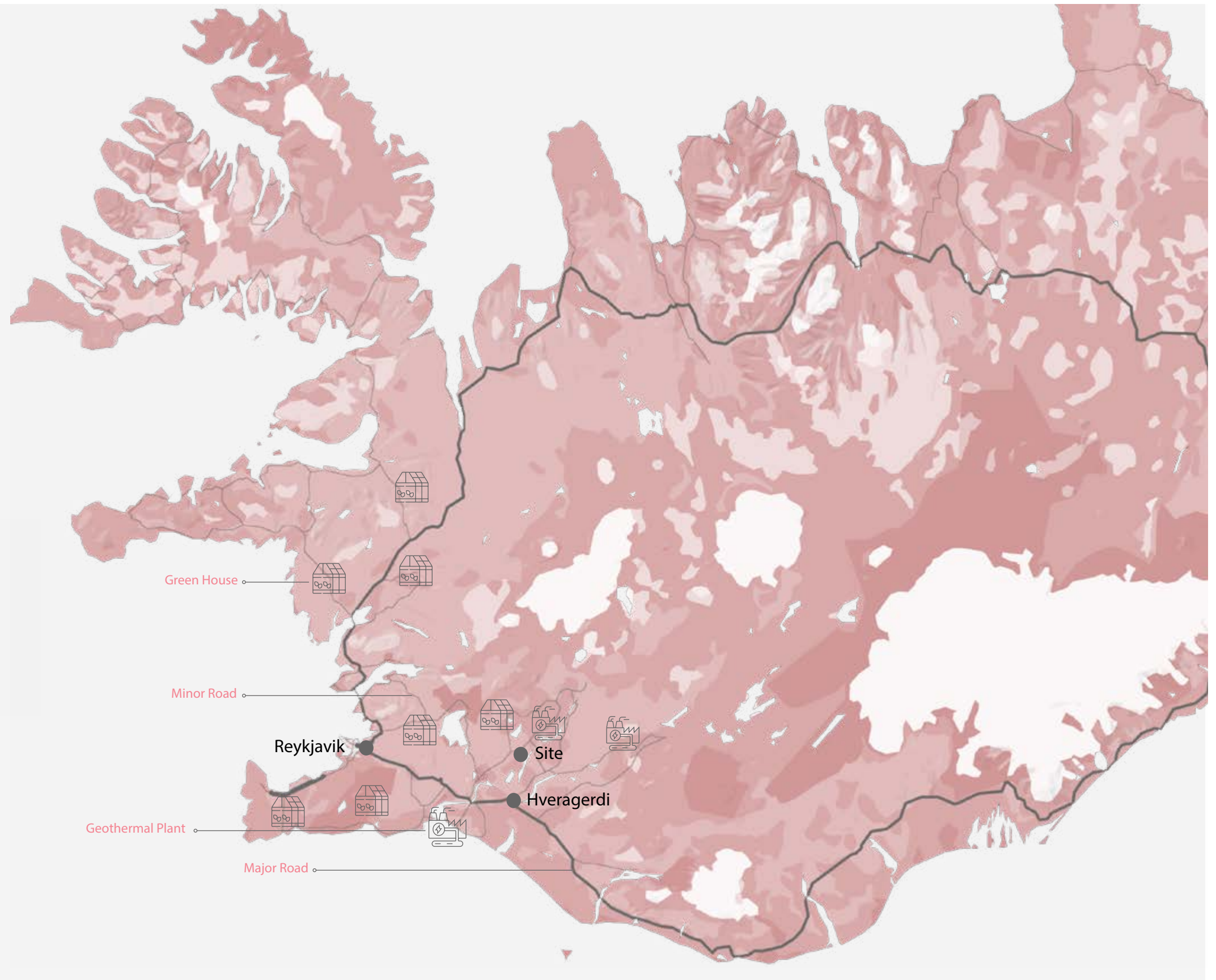
Food in Biodomes

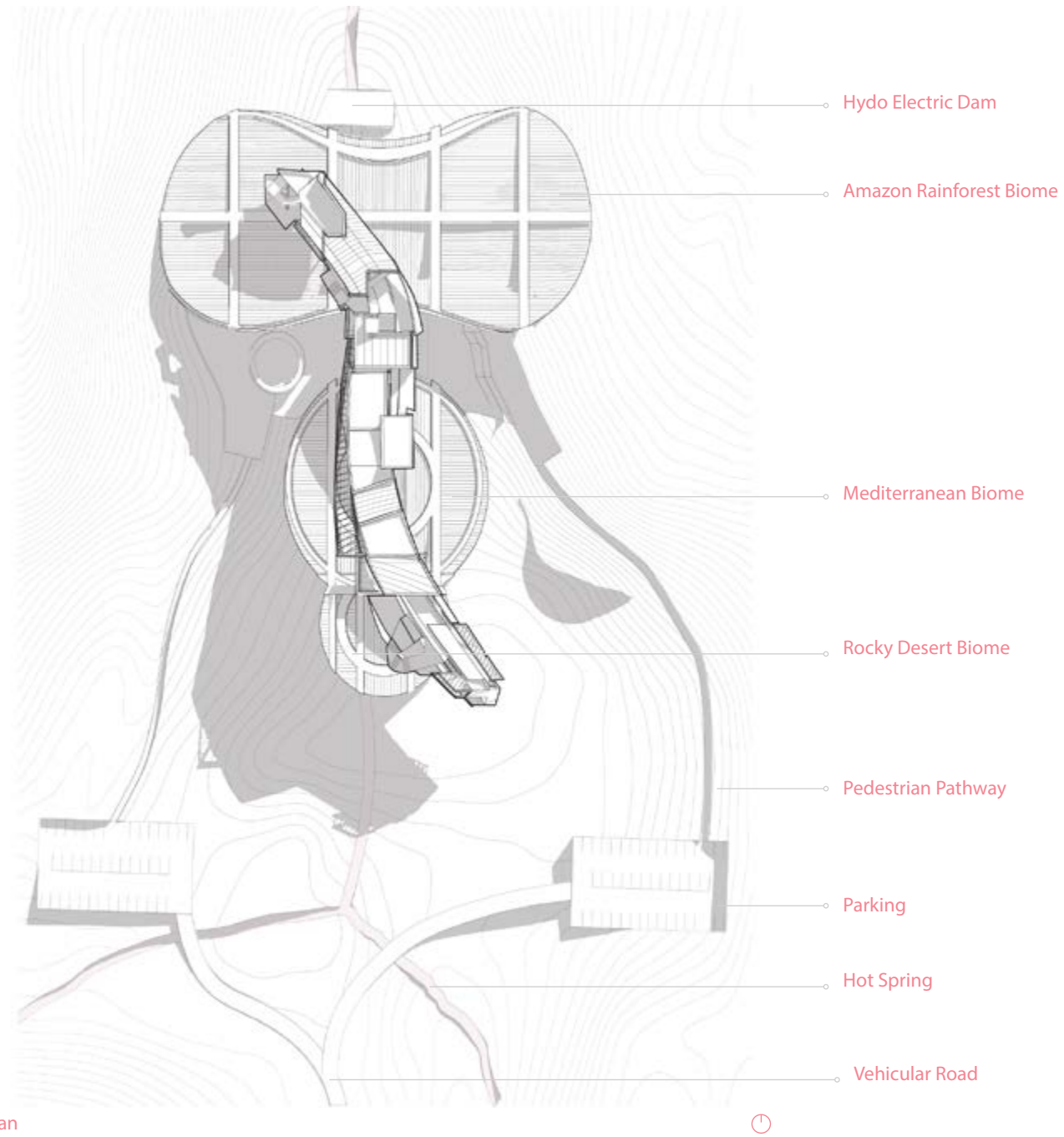


Energy on Earth

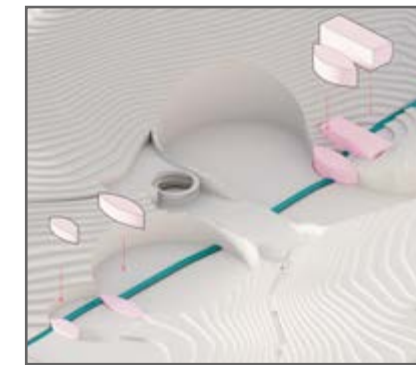


Energy for Biodomes





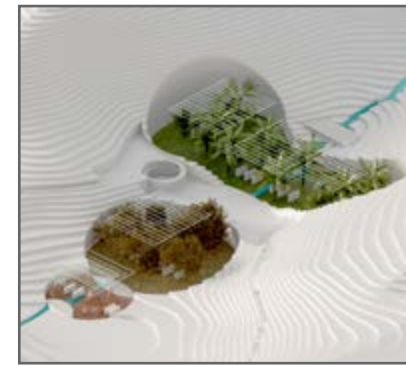
Excavation



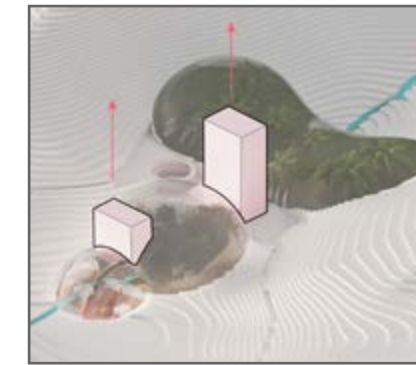
Trompe and Dam



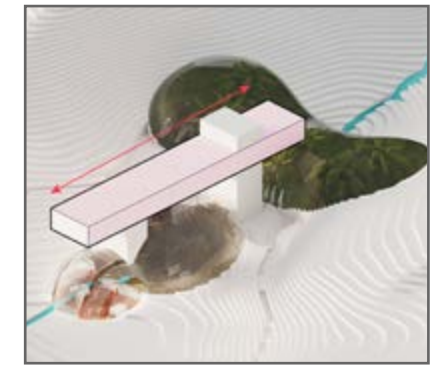
Biomes



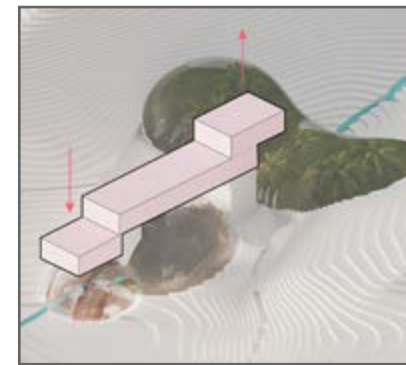
UV Lights



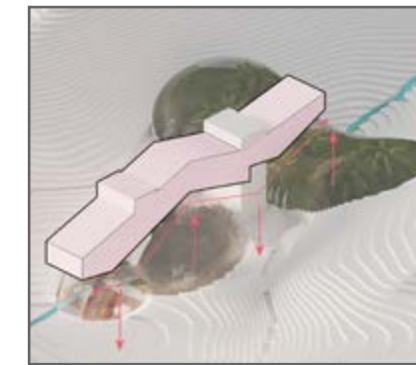
Cores Extruded



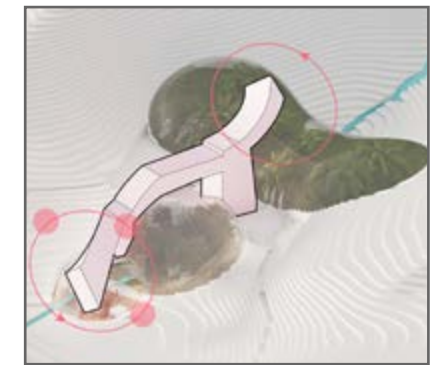
Circulation



Terrace



Undulate from Domes



Twist with Sun Path

Circulation

Vertical circulation ensures proper distribution through the upper levels. Intertwining paths provide an organic experience within the Biodomes.

Floor Plates

Evenly distributed floor plates connected with ramps and staircases to provide enough sq footage per program.

Main Structure

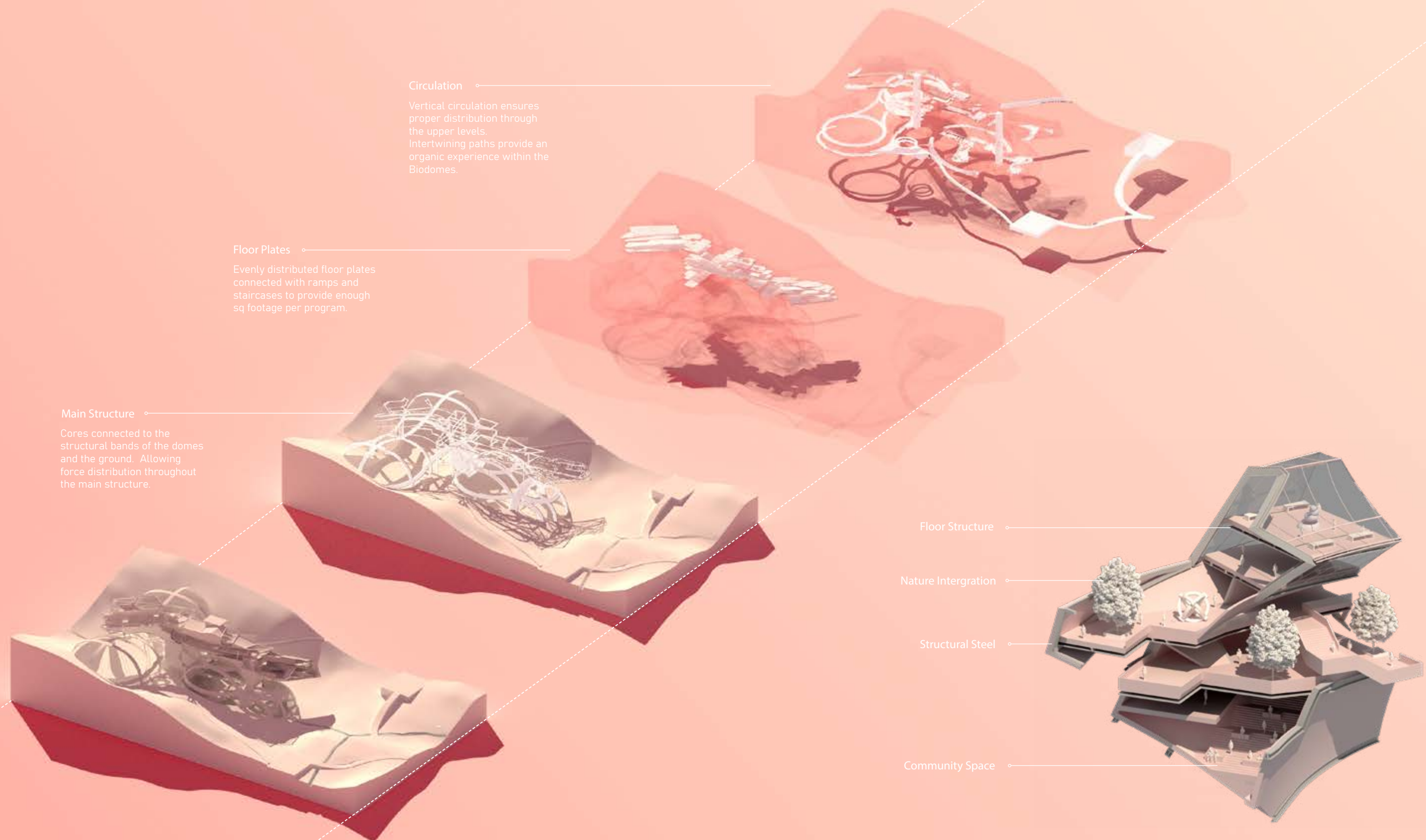
Cores connected to the structural bands of the domes and the ground. Allowing force distribution throughout the main structure.

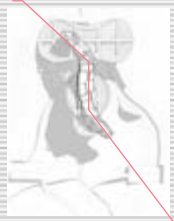
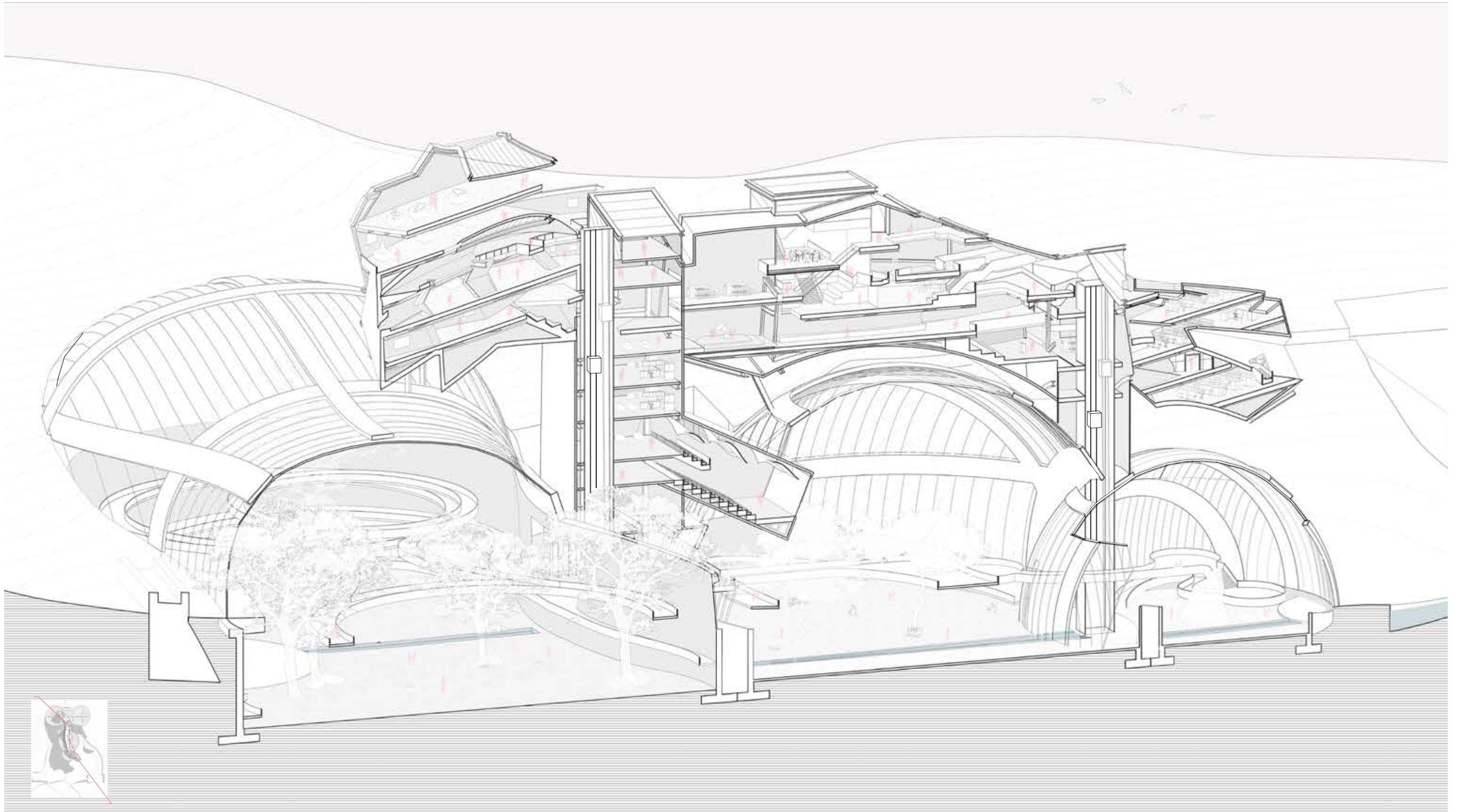
Floor Structure

Nature Intergration

Structural Steel

Community Space



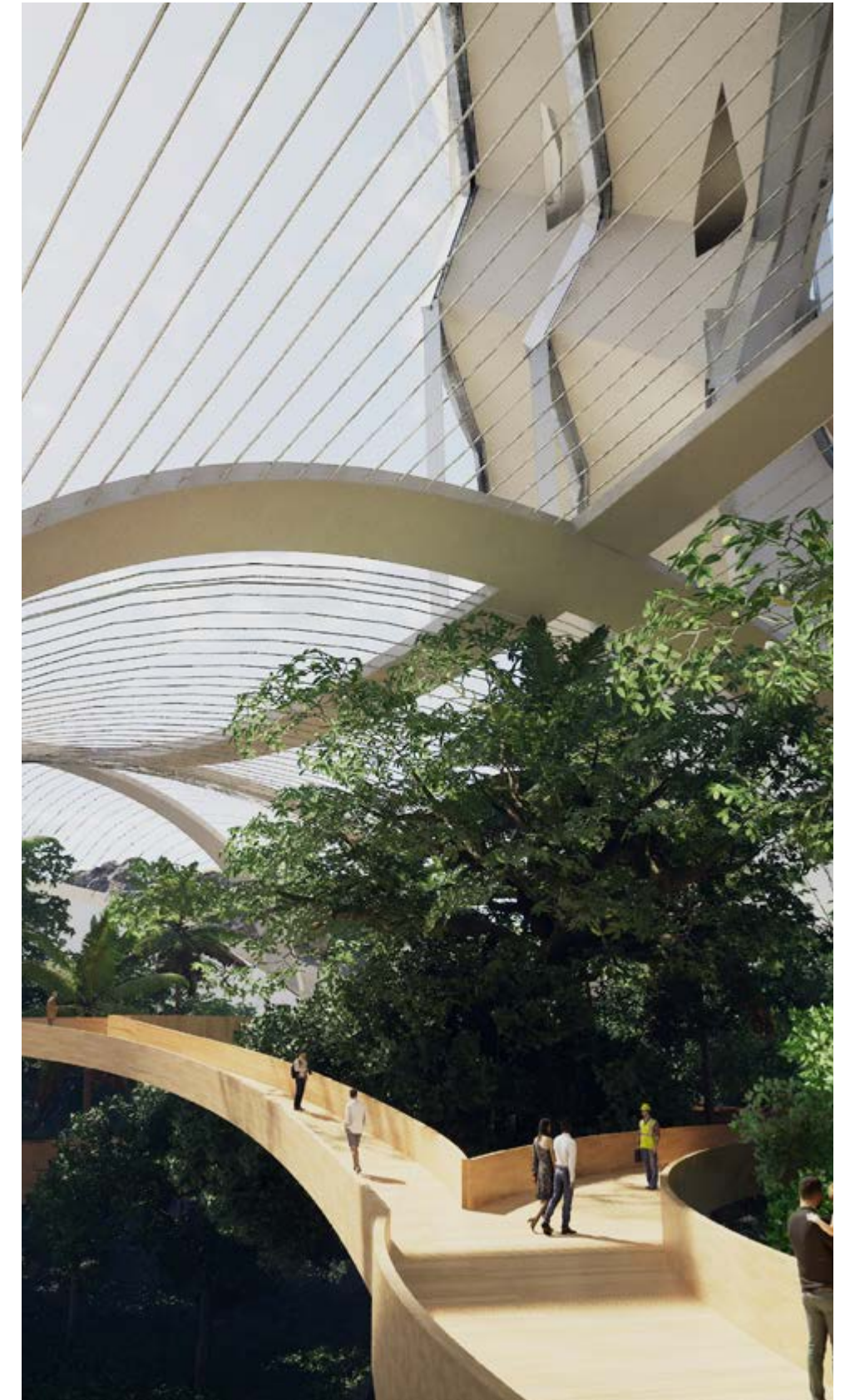




Rocky Desert Biome



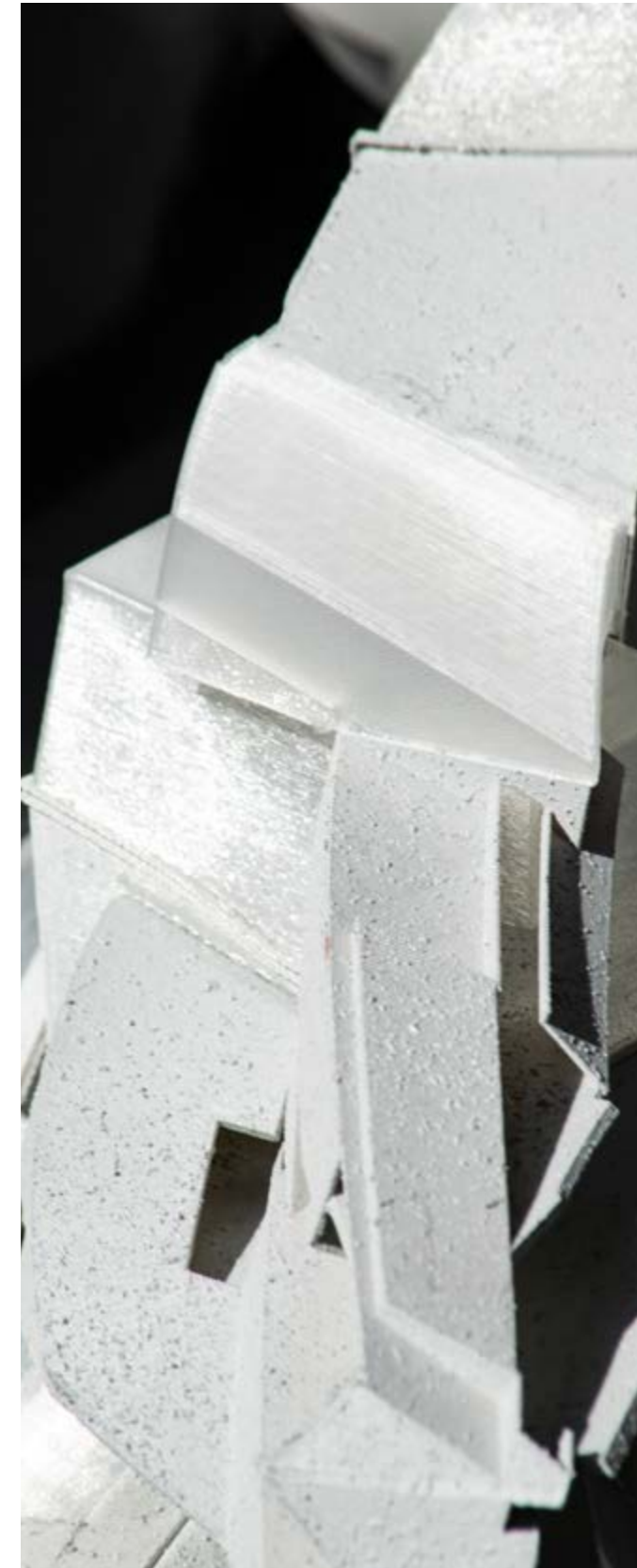
Mediterranean Biome



Amazon Rainforest Biome



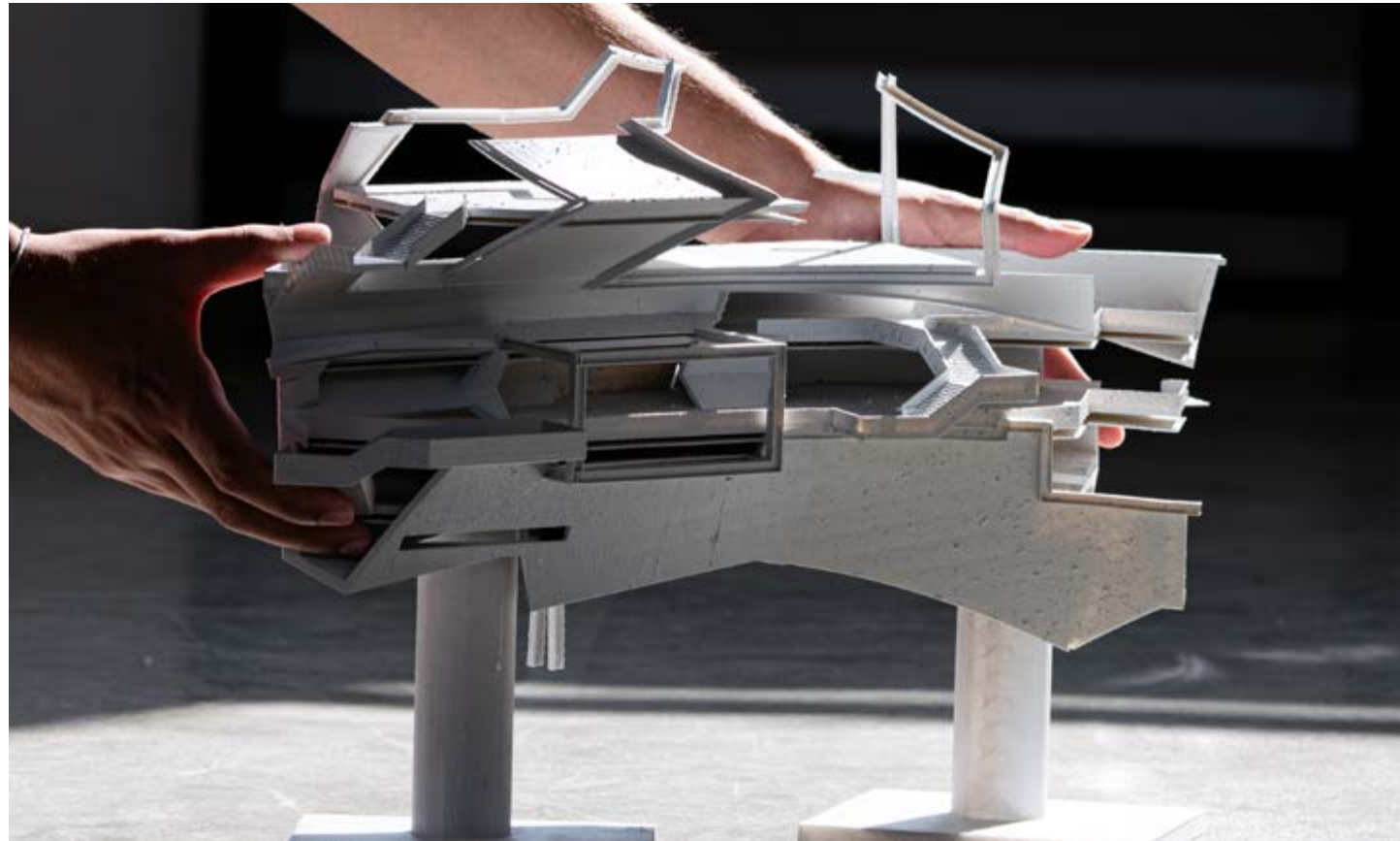
Full Model



Detail 1



Detail 2



Chunk 1



Chunk 1 Detail



Chunk 1 Detail



Chunk 2



ELEVATION PARK



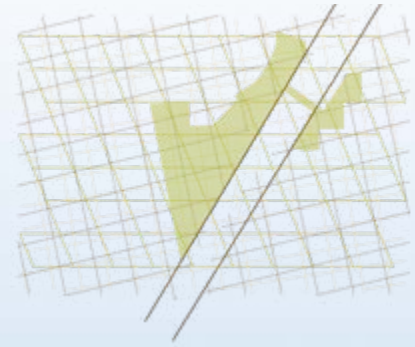
BARBARA G LAURIE
DESIGN COMPETITION
FINALIST
 FALL 2023

Team Members: Sara Gonzalez,
 Gabriela Arevelo
 Software/Skills: Rhino,
 Rhino Sub D, Grasshopper, Unreal,
 Ladybug

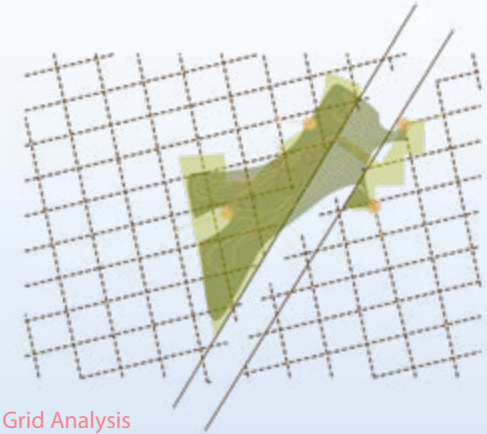
Elevation Park is formed around a park-conjunction typology, meaning it is not merely a bridge with a point a, point b connection, but that it is a wide, free-flowing space allowing for more connection and communion on both the physical and social levels within the community. As property values rise, residents get priced out. Rather than merely preventing property values from rising, Elevation Park will help more residents afford their housing as prices continue to rise. Furthermore, Elevation park's typology allows for a unified, flexible space designed to be conducive to supporting the exchange of encouragement

and ideas when it comes to fighting displacement within the local community. As it exists within the site context, Elevation Park is an expansive merger between the community spaces fractured by the construction of I-40. This physical split inhibits community connection at the social level as well. Where there is limited communication and social connection, there is limited capacity to fight issues such as displacement. As a result, there is less awareness, encouragement, and visibility. Elevation Park remedies this by providing a space that literally and socially unifies the community.





Grid Analysis
 Previous city planning has changed the grid many times over the decades splitting up the communities.



Grid Analysis
 Elevation Park aims to web them together through a conjunction.

Conjunction Thinking



2 Points



Spread



Thicken



Widen

Bridge Form



Spread



Push



Punched



Sink



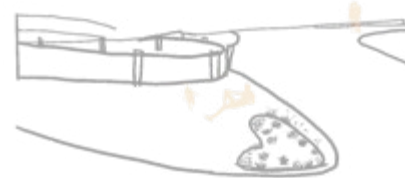


Circulation

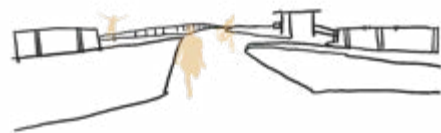
Circulation paths that show the journey from ground level to underground to rooftop to performing arts space.



Pavilion

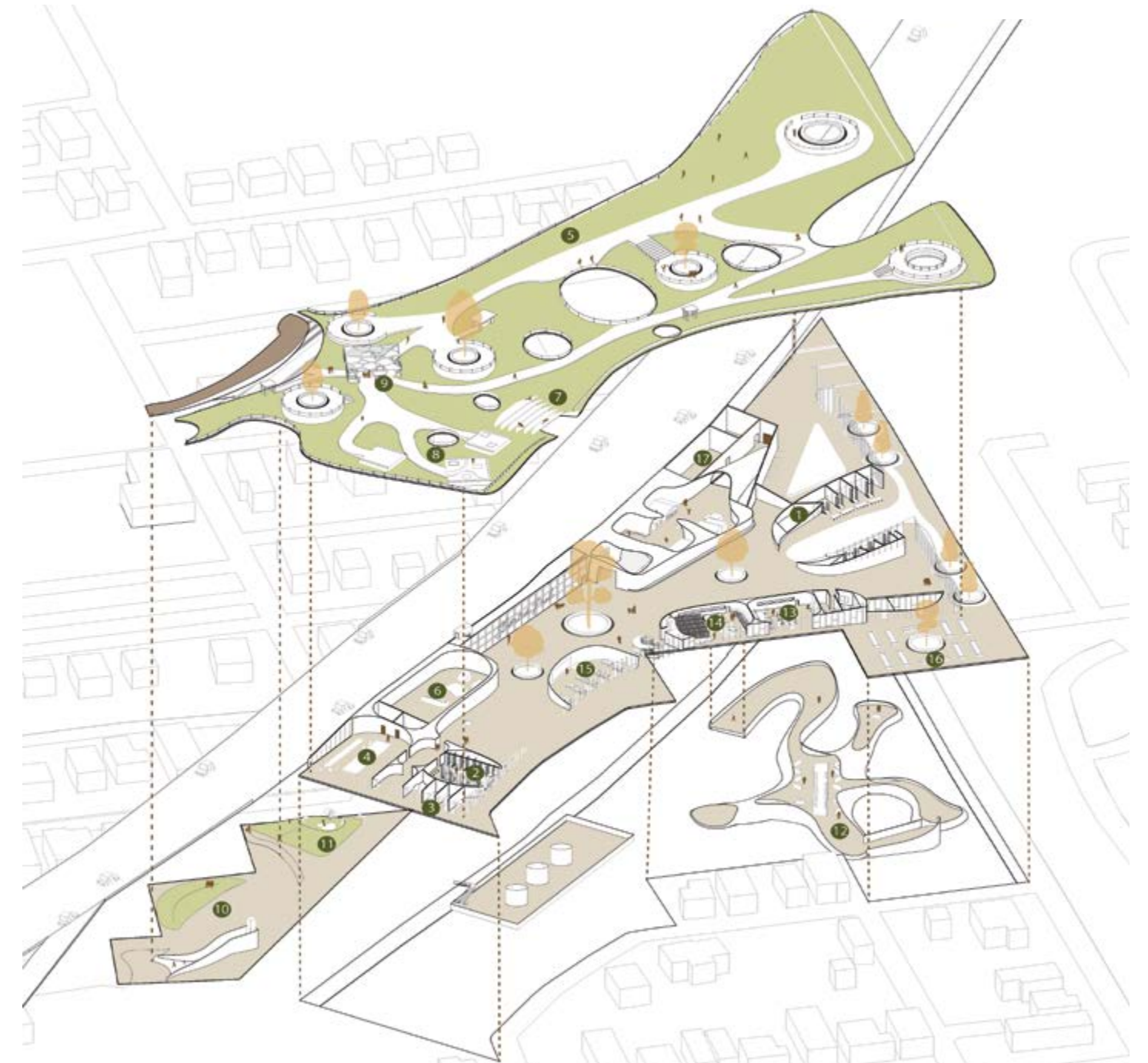


Rain Gardens



Circulation

Vignettes



Exploded Axonometric

Elevation Park is a conjunction within the community that fosters and uplifts local business, culture, and education.

Business

- 1. Restaurants
- 2. Coworking Space
- 3. Offices
- 4. Conference
- 5. Vender Markets

Culture & Recreation

- 6. Recording Studio
- 7. Amphitheater
- 8. Sculpture Garden
- 9. Pavilion
- 10. Performance Space
- 11. Playground

Education

- 12. Museum
- 13. Computer Lab
- 14. Library
- 15. Classroom
- 16. Community
- 17. Museum Offices



Pavilion



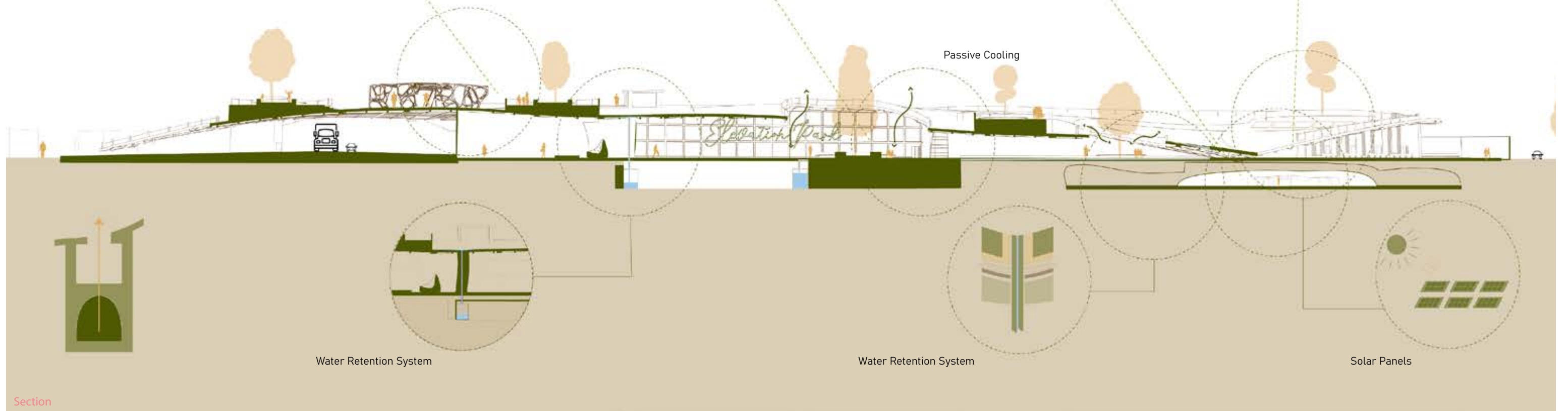
Interior



Underground Museum



Restaurant Community Space



Water Retention System

Water Retention System

Solar Panels

Section



Model Photo
Underground



Model Photo
Ground Level



Model Photo
Whole Model



DESIGN DEVELOPMENT

For Design Documentation, one project was selected and studied for the semester. These projects were developed further for what we call the documentation phase. During this course, my team worked with multiple consultants including environmental, structural, and systems. To get the most detailed result, Selected floor plans, sections, and chunks from the building were analyzed to be fully developed for the rest of the building. We also tapped

DESIGN DEVELOPMENT

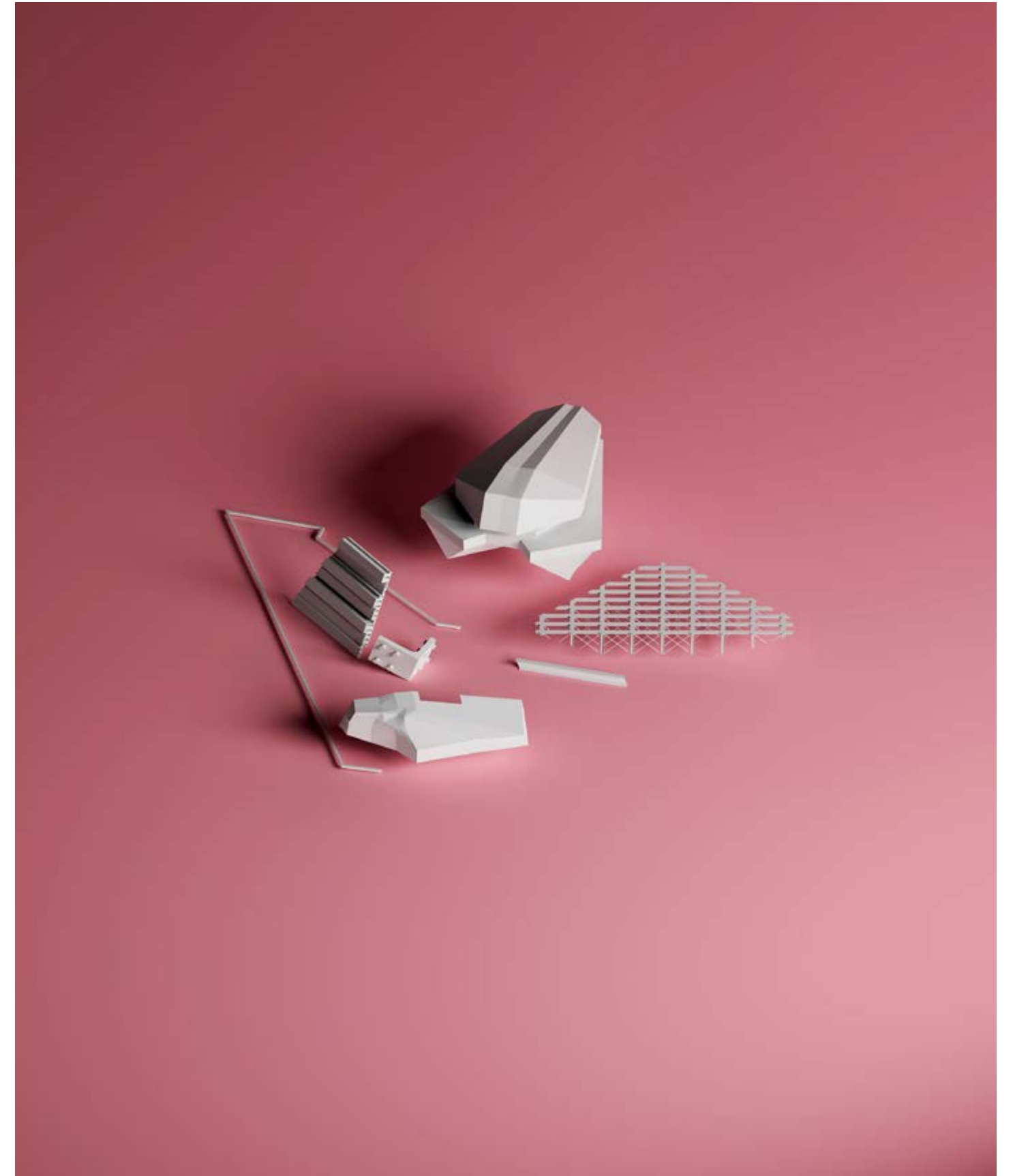
FALL 2022

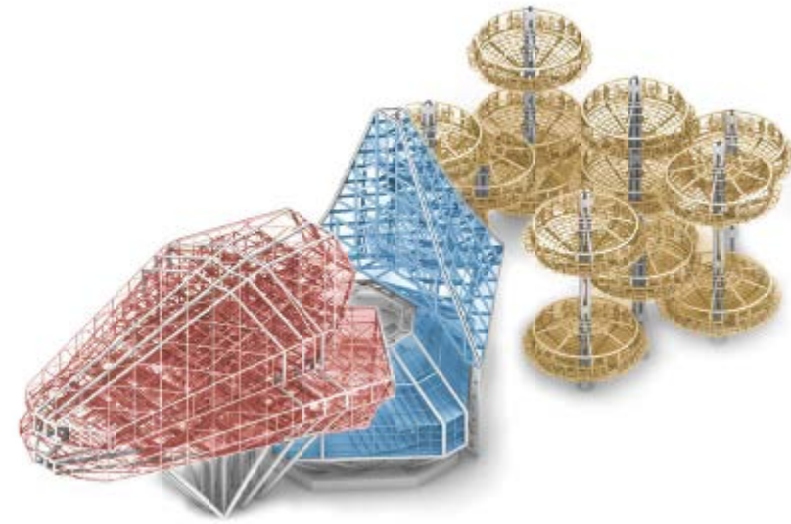
Instructor: Herwig Baumgartner
Zach Burns

Team Members: Claire Trout,
Mohamem Rezk, Lexin Liu, Sasha
Lapshina, Syl Kulkarni, Wei-Hung
Chen, Jack Freedman, Abhishek
Kadian

Software/Skills: Rhino,
Grasshopper, Unreal, Ladybug,
Massmotion, Pyrosim

into other softwares like pyrosim to simulate how the building would react to a fire and also mass motion. A software to simulate how one would exit the building if incase of a emergency. Following AIA Standard Form we produced a cost analysis sheet to understand the hard construction cost, soft construction cost, construction contingency, project life cycle, and financial considerations.





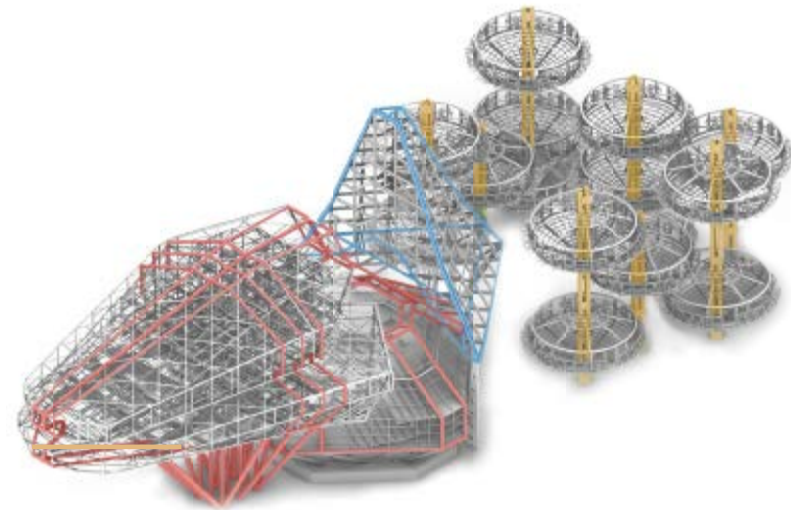
3D Space Truss



Floor Slab and Steel Grid



Angled Steel Tubes



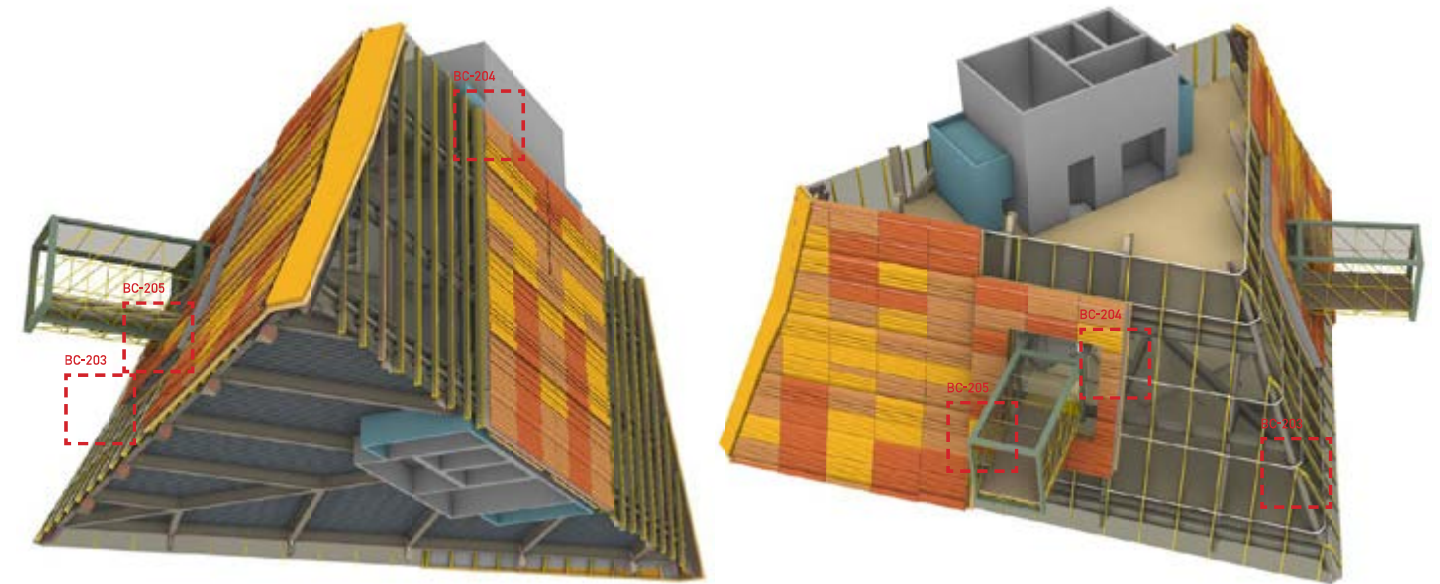
Angled Rolled Steel I-Beams



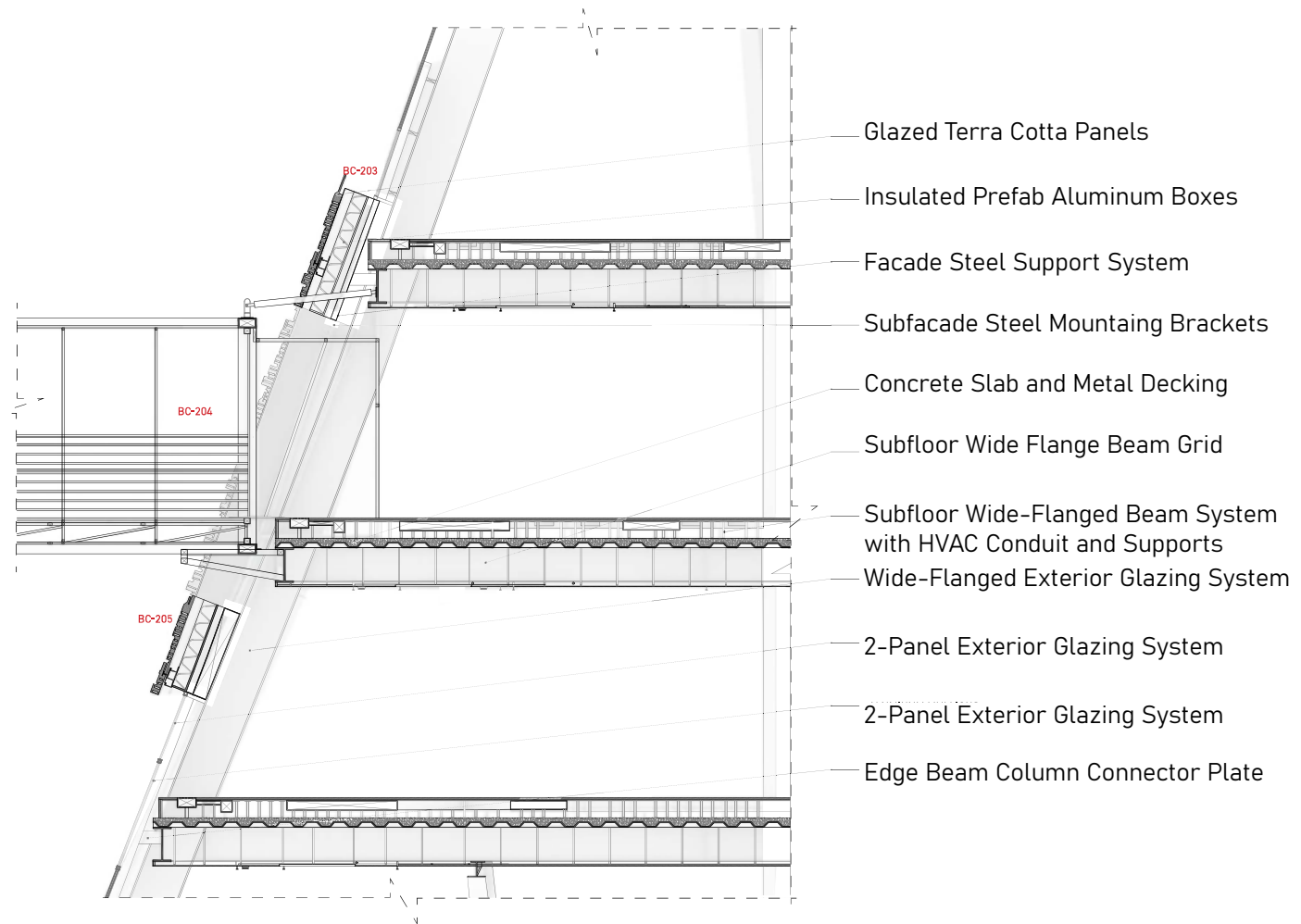
Structural Steel Cantilevers



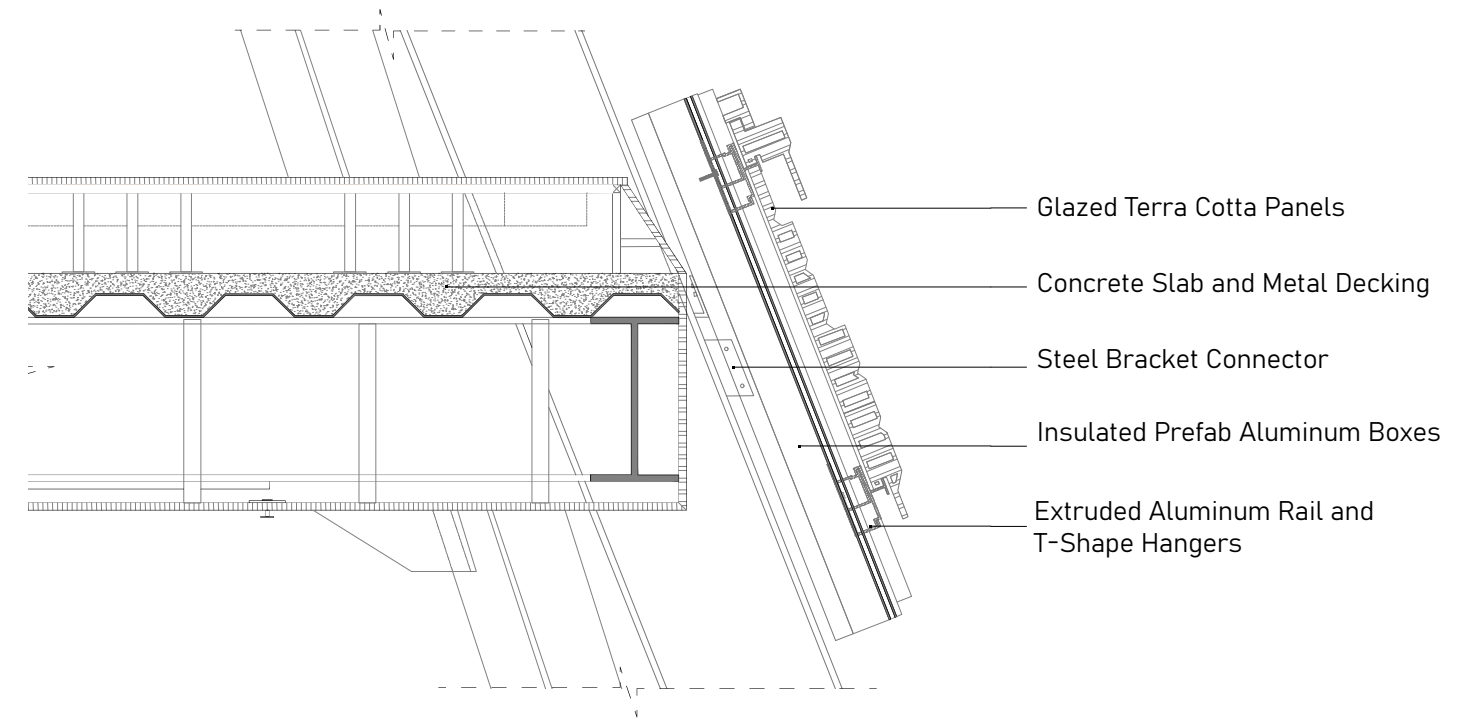
Reinforced Concrete Columns



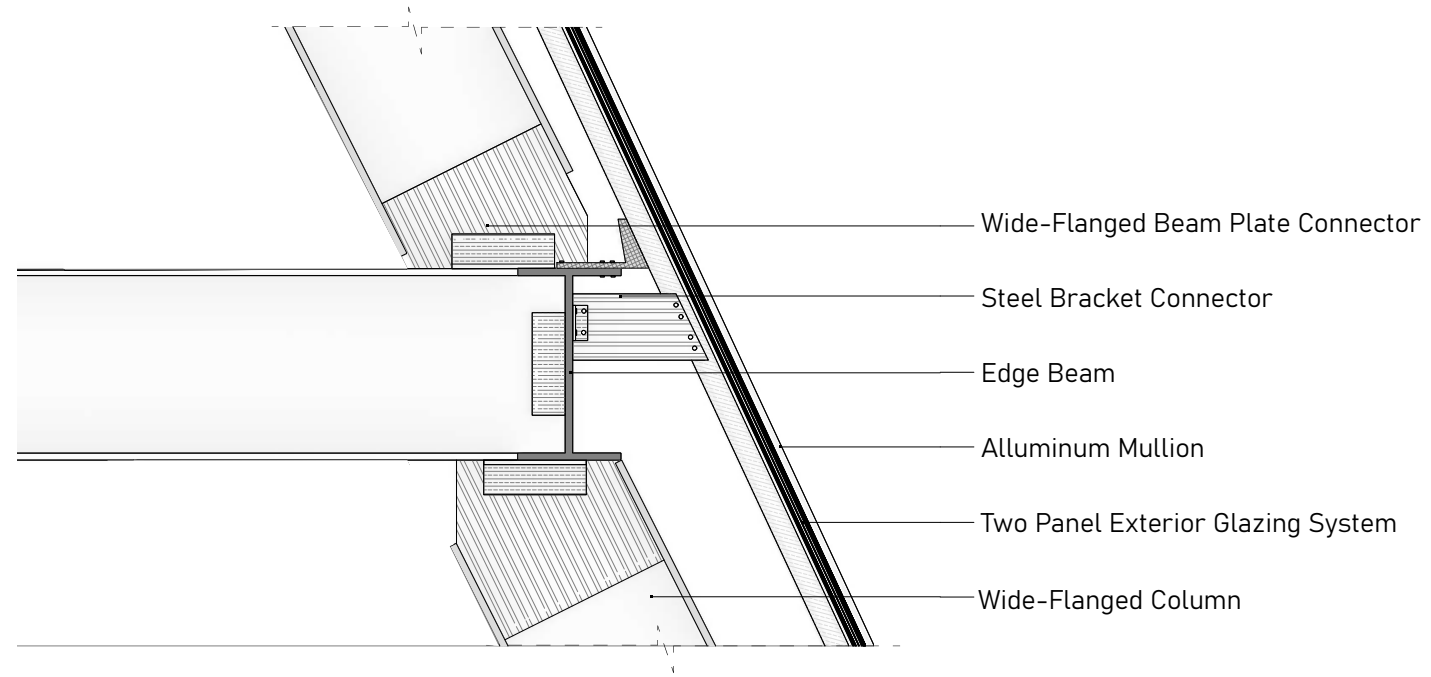
Central Chunk



Central Chunk Wall Section

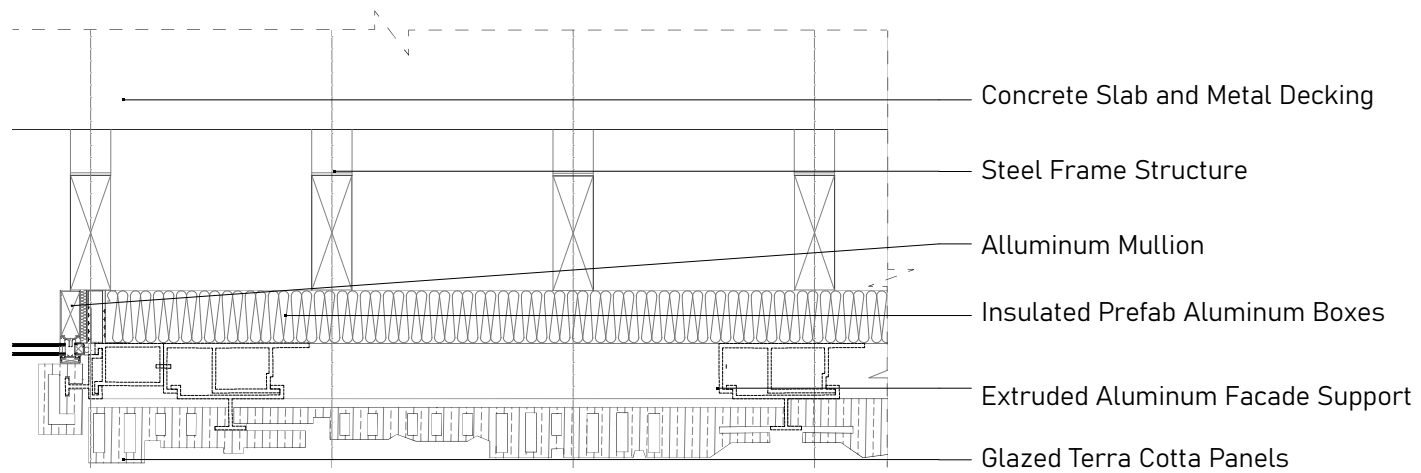


Detail 2



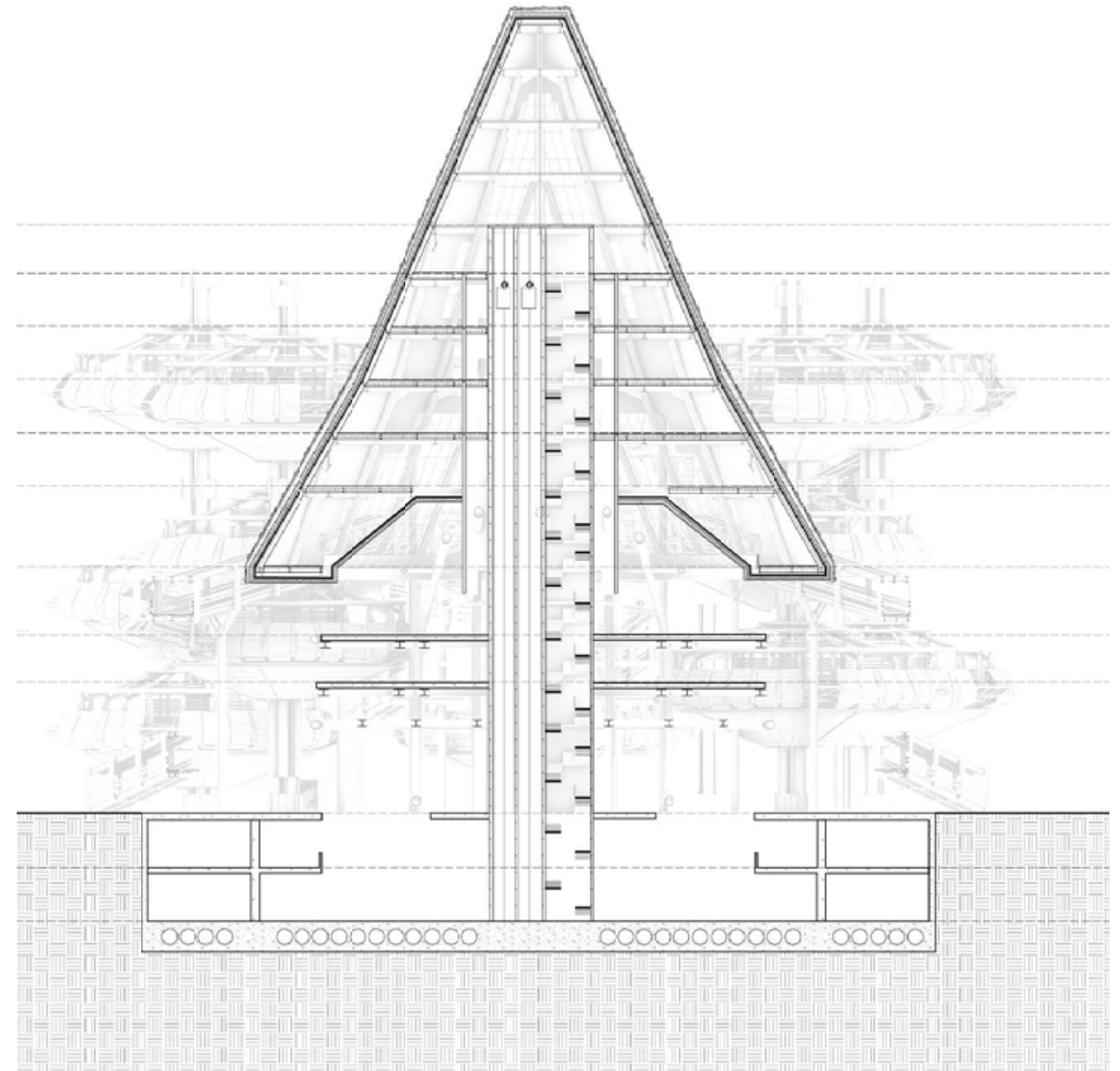
- Wide-Flanged Beam Plate Connector
- Steel Bracket Connector
- Edge Beam
- Aluminum Mullion
- Two Panel Exterior Glazing System
- Wide-Flanged Column

Detail 1

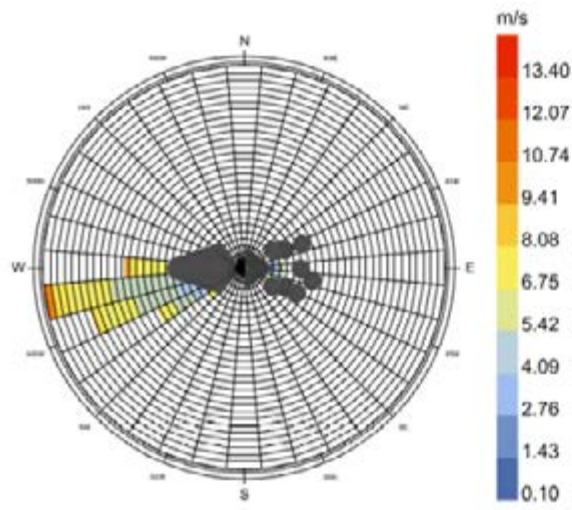


- Concrete Slab and Metal Decking
- Steel Frame Structure
- Aluminum Mullion
- Insulated Prefab Aluminum Boxes
- Extruded Aluminum Facade Support
- Glazed Terra Cotta Panels

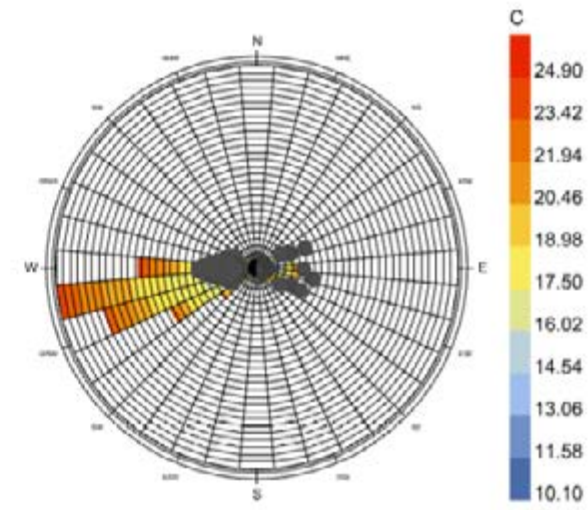
Detail 3



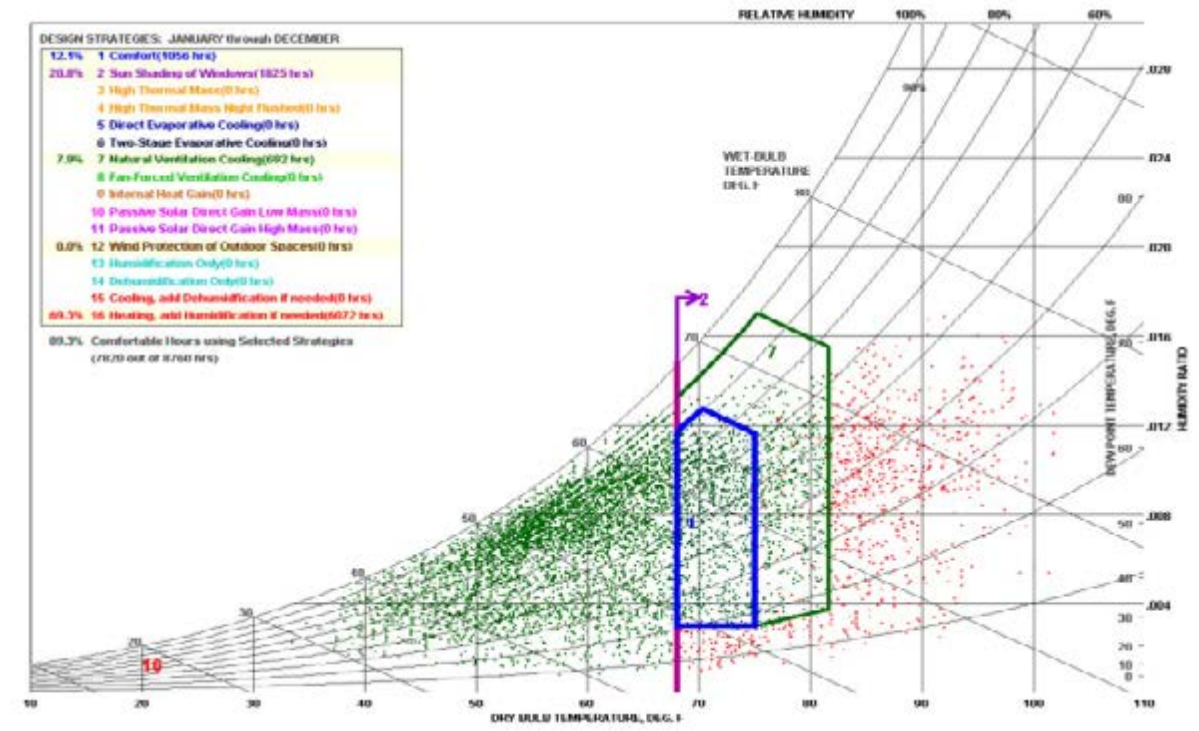
Section



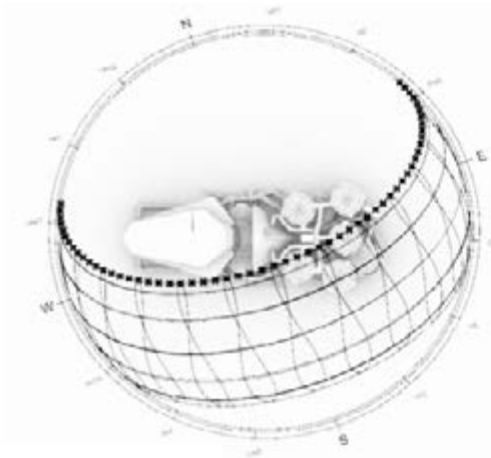
Los Angeles Wind Rose
Spring-Summer



Los Angeles Wind Rose
Fall-Winter



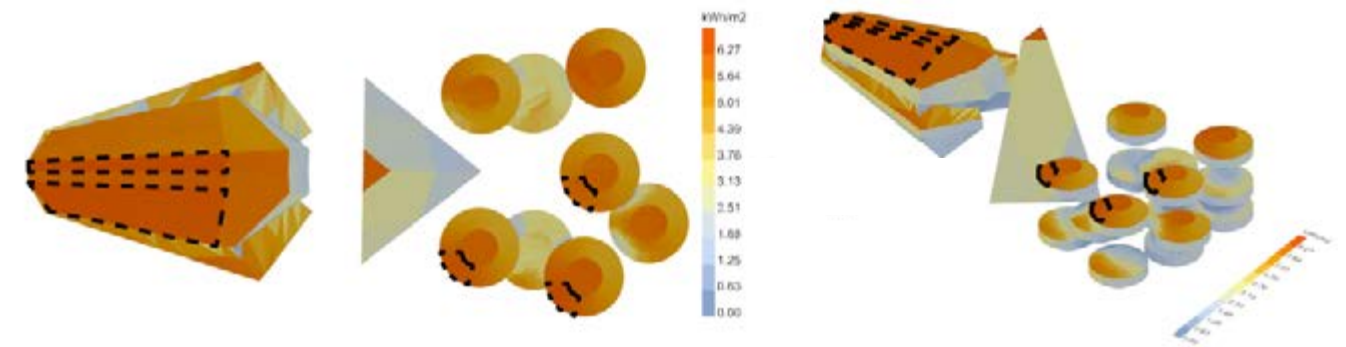
Psychrometric Chart



Sun Path
Plan View



Sun Path
Perspective View



Solar Radiation
Highlighting Solar Array Zone

Solar Radiation
Perspective View

THE NATIONAL MUSEUM OF THE AMERICAN LATINO

Vertical Studio

Spring 2023
Instructor: Marcelo Spina

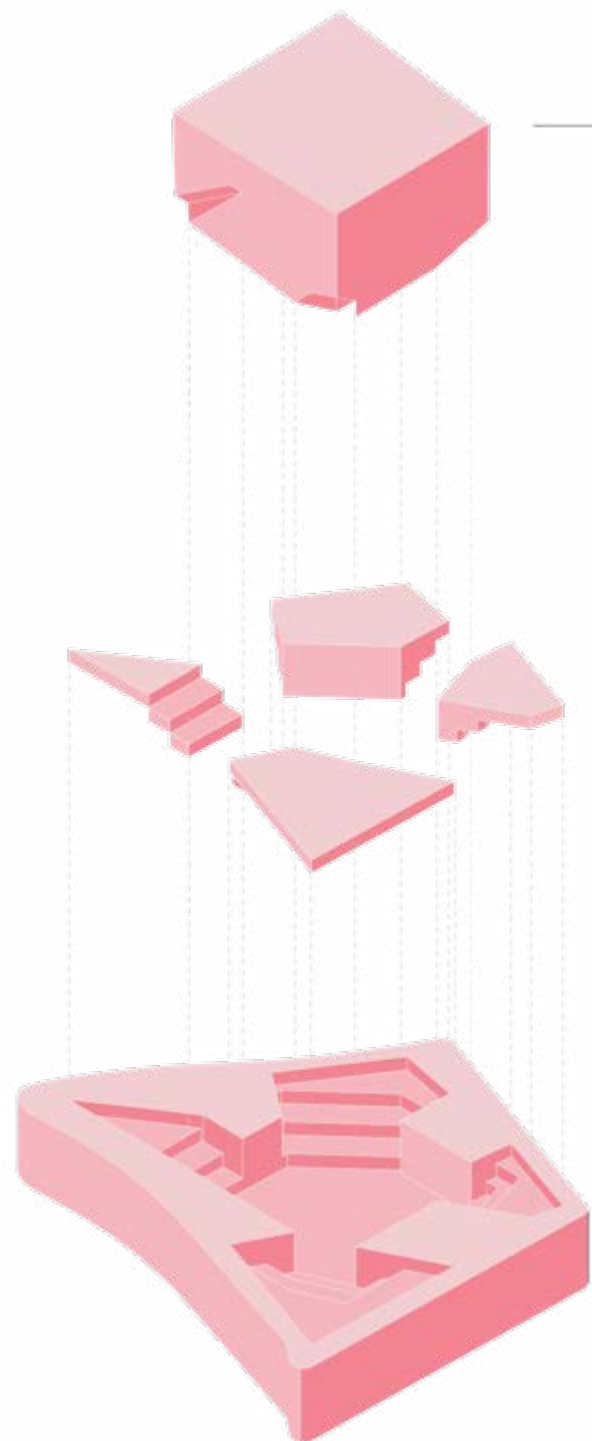
Software/Skills: Rhino, Cinema 4D,
Octane, Adobe After Effects, Adobe
Premiere

The National Museum of the American Latino, located in Washington D.C., delves into the exploration of monumentality and the significance of designing a space that reflects the essence of Latino culture on the national mall. The architectural program focuses on celebrating contemporary Latino culture while drawing a contrast to the modernist architectural style. Externally, the building boasts a pure and distinctive form, prominently using granite to create a unique and captivating appearance. The articulated rawness of the granite offers a compelling visual statement that sets it apart from surrounding structures. Internally, the museum carves out large community spaces, fostering a sense of

togetherness among the Latino community in Washington D.C. The interior design presents a striking contrast, skillfully combining lighter wood and stone elements to complement the dark granite exterior. This interplay of materials establishes a welcoming and inviting atmosphere within the museum.

Overall, this project highlights the significance of designing with a specific culture in mind, ensuring that the architecture pays homage to the rich Latino heritage while harmonizing with the context of Washington D.C. The National Museum of the American Latino stands as a symbol of inclusivity, culture, and community, offering a profound cultural experience for visitors and residents alike.





Primitive Object

Using a pure exterior form that uses the landscape to shape the base of the form allows a intergration on landscape and form.

Void Forms

Using forms of terracing to create void space in the landscape that also forms void space on the building.

Landscape

The landscape surrounds a central node that provides a large community space for the people of Washington D.C.



Materiality

The contrast of the materials highlight the life inside the building coming out and bringing in the local pedestrian.



Elevation

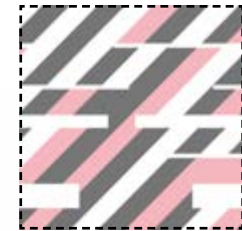
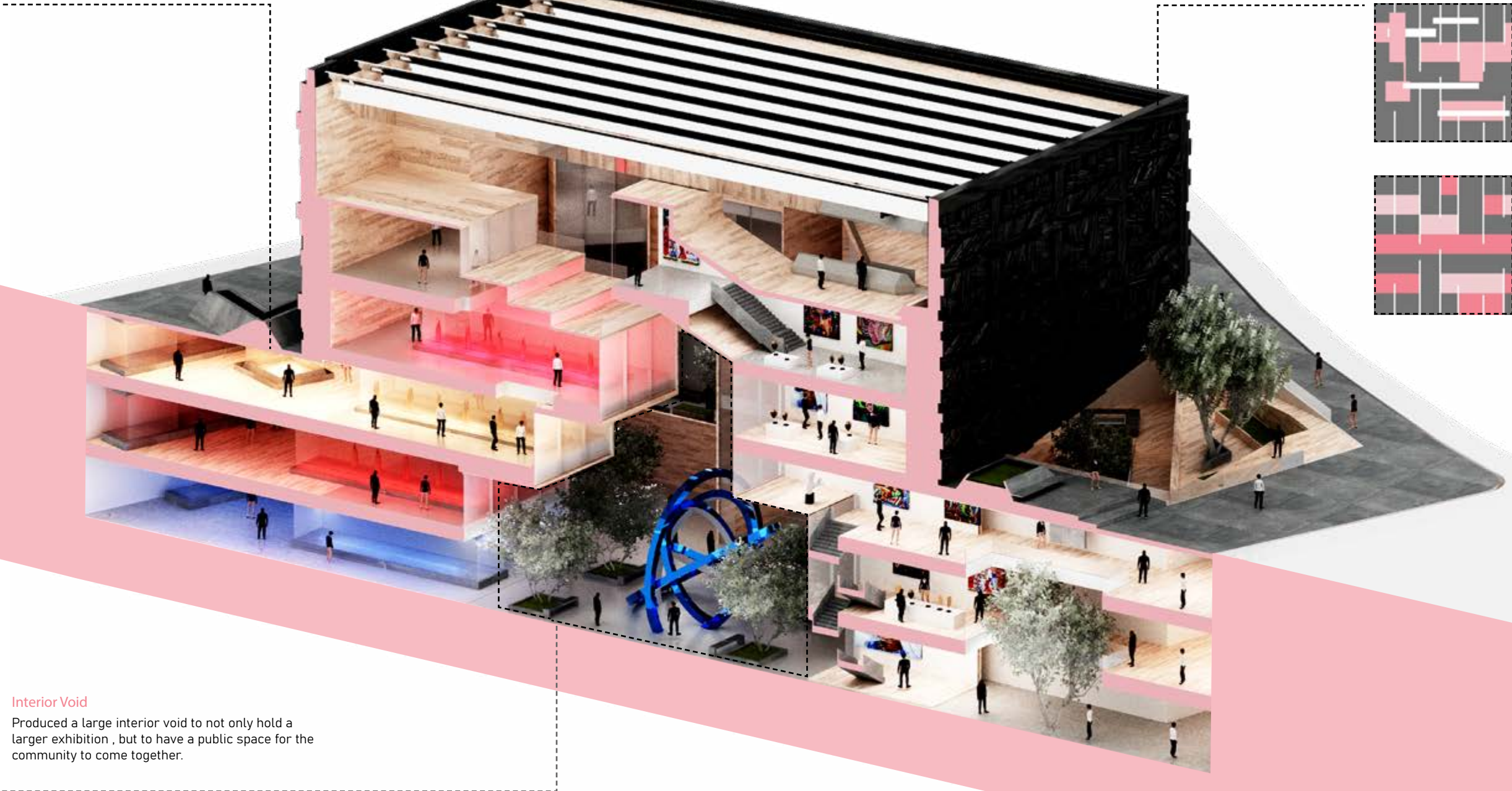
The building is intended to hide the entrance to force the pedestrian to wonder around the building and discover new perspective of primitive shape.



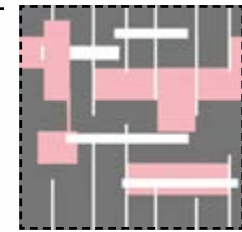
Multiple Sized Spaces
 Establishing multiple size spaces to hold intimate exhibition spaces.



Interior Void
 Produced a large interior void to not only hold a larger exhibition, but to have a public space for the community to come together.



Facade
 Utilizing displacement maps to generate a unique facade design.

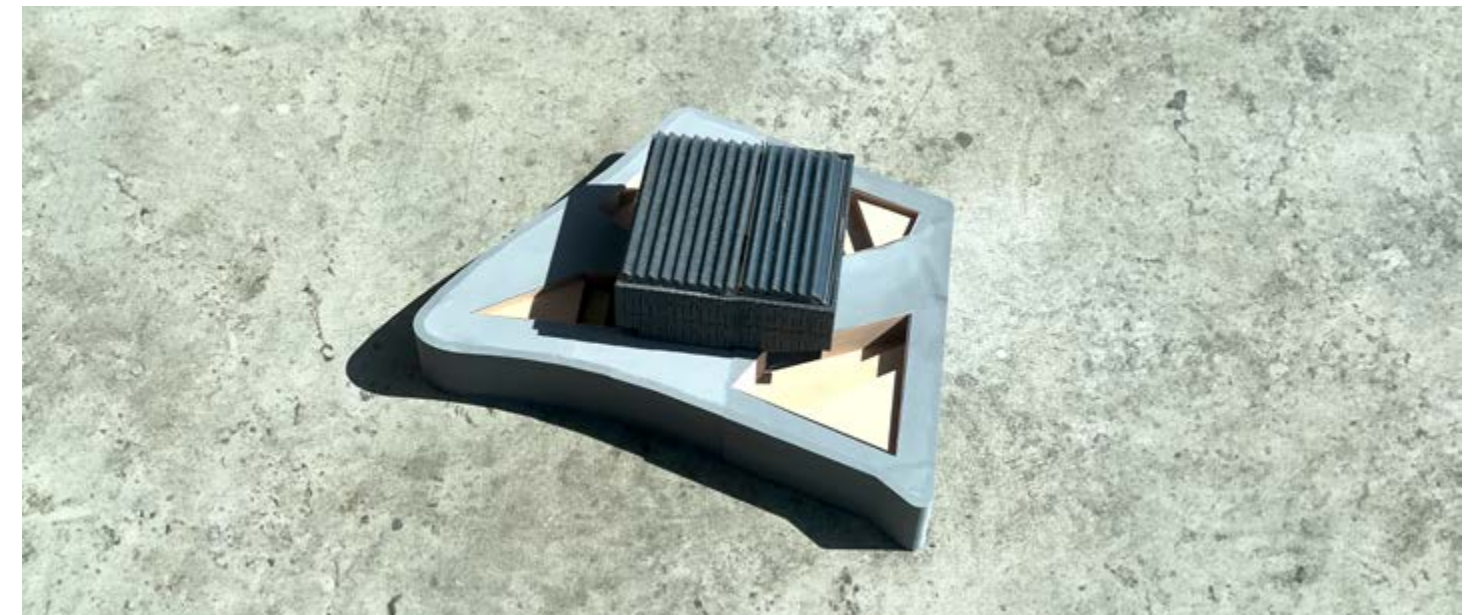




Exterior Model Open



Interior Section Model



Exterior Model Open

