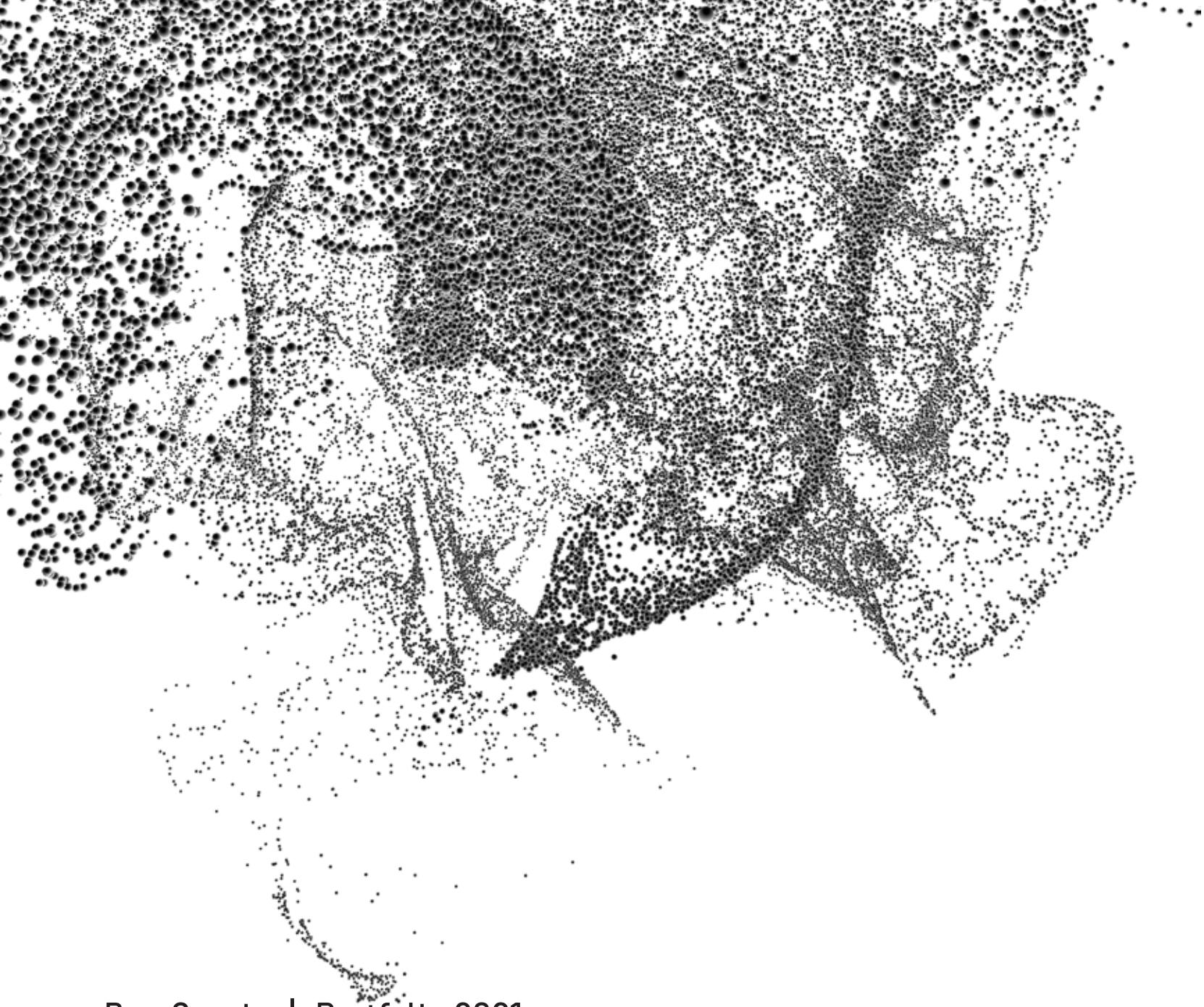

Ben Garcia | Portfolio 2021

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Bachelor's of Arts and Architecture
The University of New Mexico

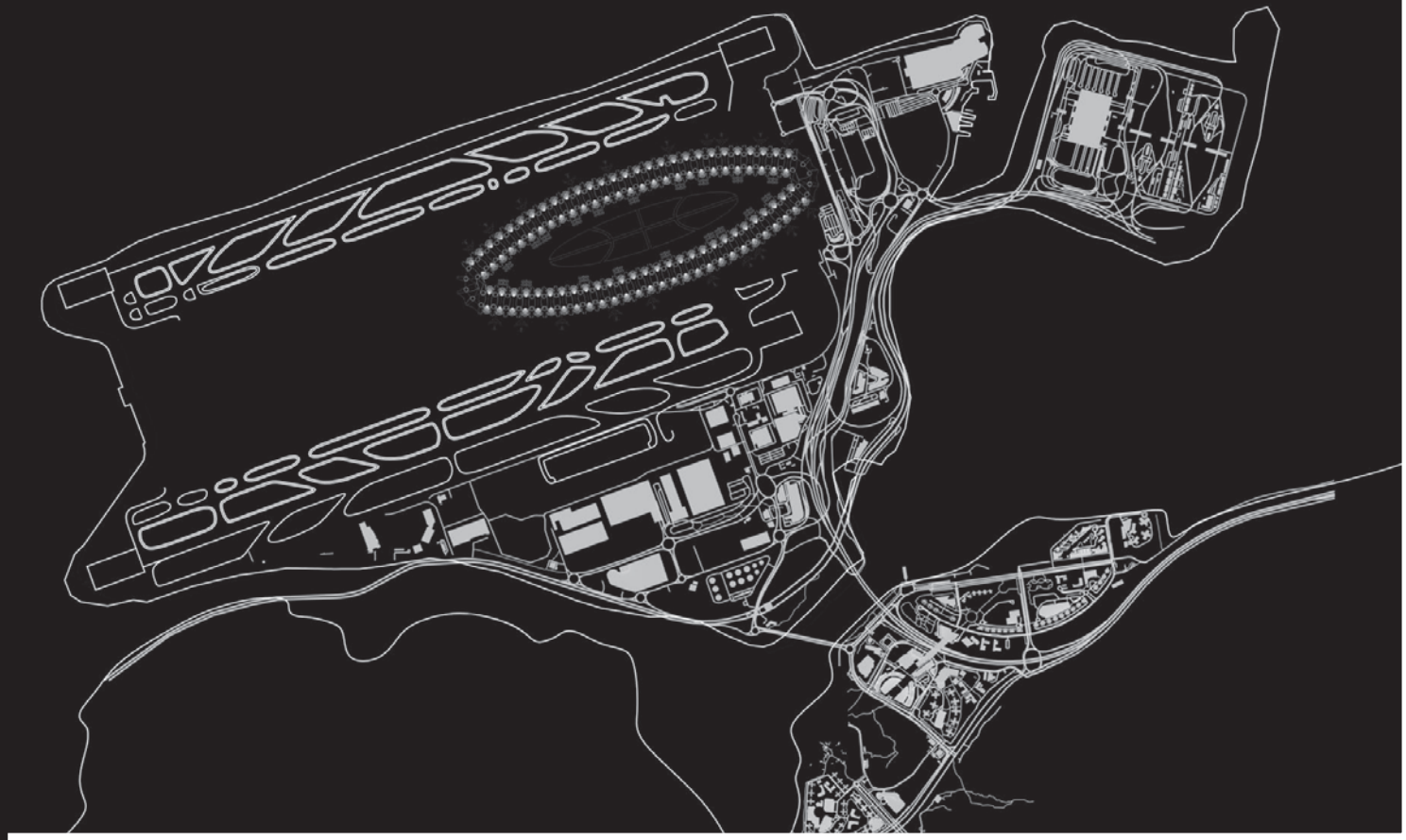
Index of Projects

Modular Airport: HKIA

Fentress Global Challenge | 402 Studio | Shortlist Award

The Fentress Global Challenge is an annual international student design competition hosted by Fenstress Architects. It requires students to redesign a large-scale airport in the year 2075. The following are a selection of presentation sheets from the Fentress Global Challenge submission. This project was completed by my colleague, Theo Pinceloup and I.

NEW HKIA SITE PLAN----------N----------



INTRODUCTION

One of the busiest airports in the world for both passenger travel and cargo movement, the Hong Kong International Airport serves as an integral transportation hub in Eastern Asia. Anticipating exponential growth in the coming years, HKIA requires substantial reconfiguration and optimization to accommodate the massive amount of traffic as the airport continues to grow. In order to accomplish this, a design that incorporates adaptability and amelioration is necessary and achievable through modularity. This enables the airport to expand and accommodate more traffic without impeding the day-to-day operations. Coupled with anticipated advancements in aviation, security, and construction technology, this all coalesces into a streamlined experience for passengers and aviation workers alike.

By utlizing a modular addition system in the construction of the new Hong Kong International Airport, the airport is able to be expanded without impeding the day-to-day operations of the system. With little construction impact, the airport can maintain its massive volume of daily service without needing to temporarily decommission sections of the airport during expansion projects. This repititious system also minimizes the need for runway expansion, as the modules utilize the existing space by accommodating as many gates as possible without wasting space on site. The terminal's elliptical footprint creates two seperate airfields: the inner field operating with vertical takeoff aircraft for short-distance, domestic flights, and the outer airfield conducting long-distance flights utilizing traditional horizontal takeoff aircraft. The terminal is elevated off the ground plane to provide maintenance and cargo vehicles passage underneath the main structure, giving them a means of servicing both airfields efficiently.

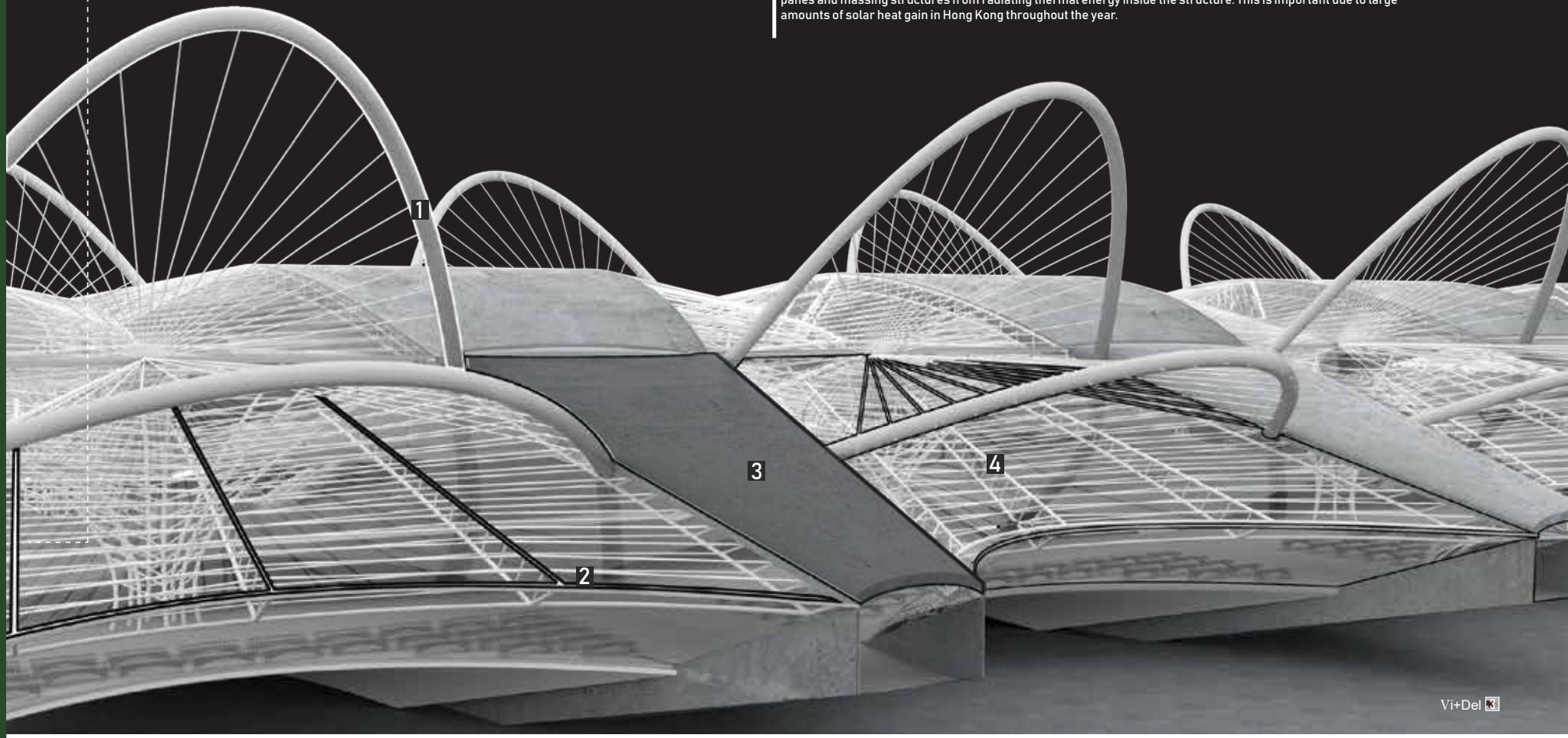
MODULE FITTING DIAGRAM ----------►

1 Arched exhaust tubes repeated along each module channel hot air from the interior of the structure, passively venting excess heat from the structure.

2 Utilization of graphene structural members allow the structural system to support the substantial load of the terminal. This lightweight material boasts a stronger tensile and compressive strength than steel, giving it more versatility in this unique structural system.

3 Implementing carbon nanotube inlays to the structural concrete portions of the building gives the members additional tensile and compressive strength, moreso than with rebar or other modern reinforcements. This allows the structural system to accommodate a lighter and more radical design, without sacrificing the integrity or safety of the structure.

4 Glass-polymer hybrid glass coating is a thin, carbon-lattice film that can be applied to virtually any surface for passive cooling. The paper-thin film reflects solar energy from the exterior of the structure, preventing large glass panes and massing structures from radiating thermal energy inside the structure. This is important due to large amounts of solar heat gain in Hong Kong throughout the year.



INTERNATIONAL GATES

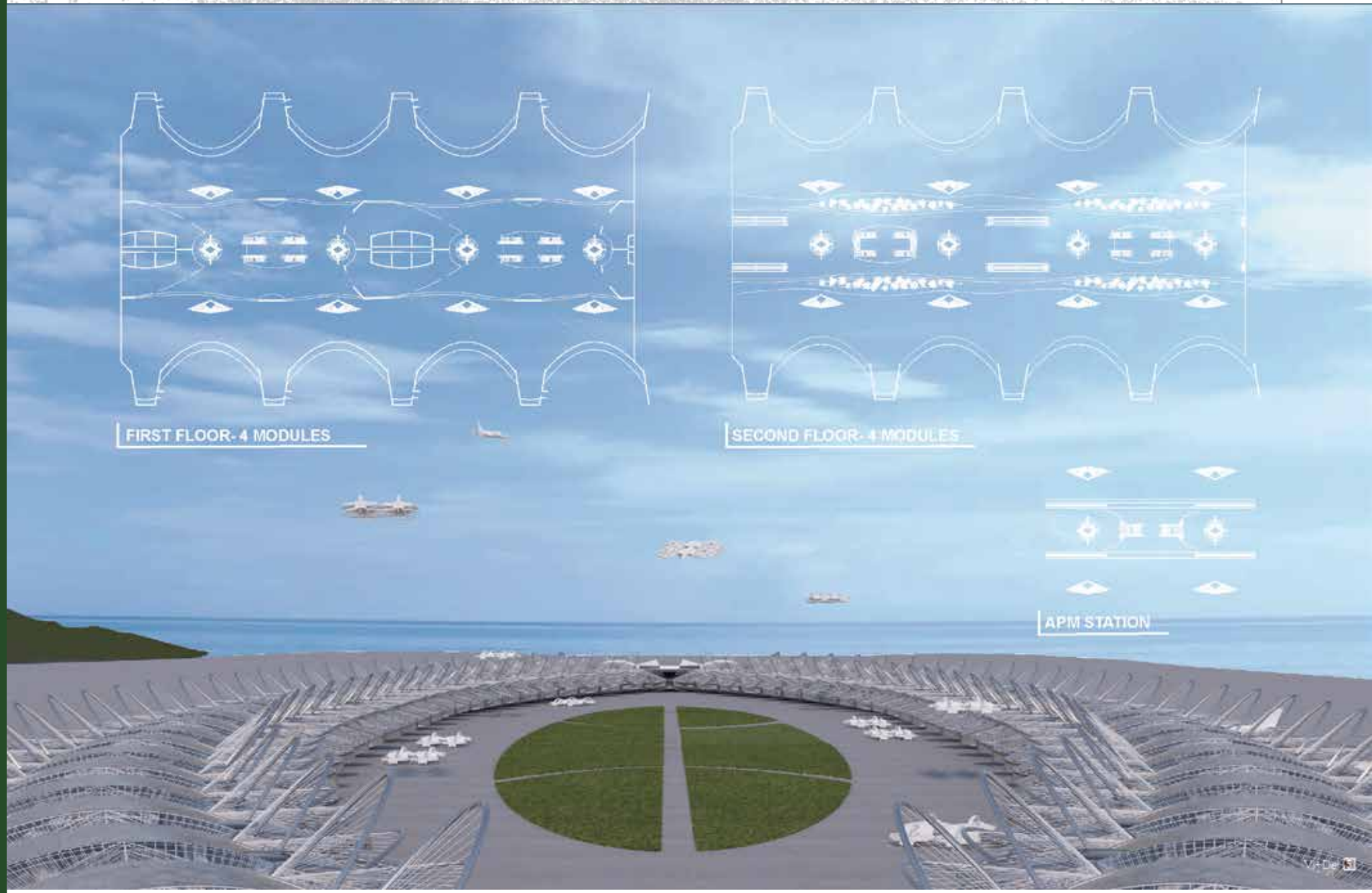
PLANE SERVICE CORRIDOR

INTERMEDIATE CIRCULATION

APM STATION

DOMESTIC GATES

Vi + Del, comprised of Ben Garcia and Theo Pinceloup, is a design team from The University of New Mexico School of Architecture and Planning (UNM SA+P). Garcia and Pinceloup are both fourth-year students in the program and completing degrees in the pre-profession track of the Bachelors in Arts and Architecture at the time of this competition. From Colorado and France, respectively, the team specializes in three-dimensional modelling/rendering and two-dimensional drafting. Garcia and Pinceloup both plan to continue pursuing careers in the design field and are working toward licensure as architects. After this competition they will be working together on a few more competition projects to further our skills as designers.


FIRST FLOOR- 4 MODULES
SECOND FLOOR- 4 MODULES
APM STATION

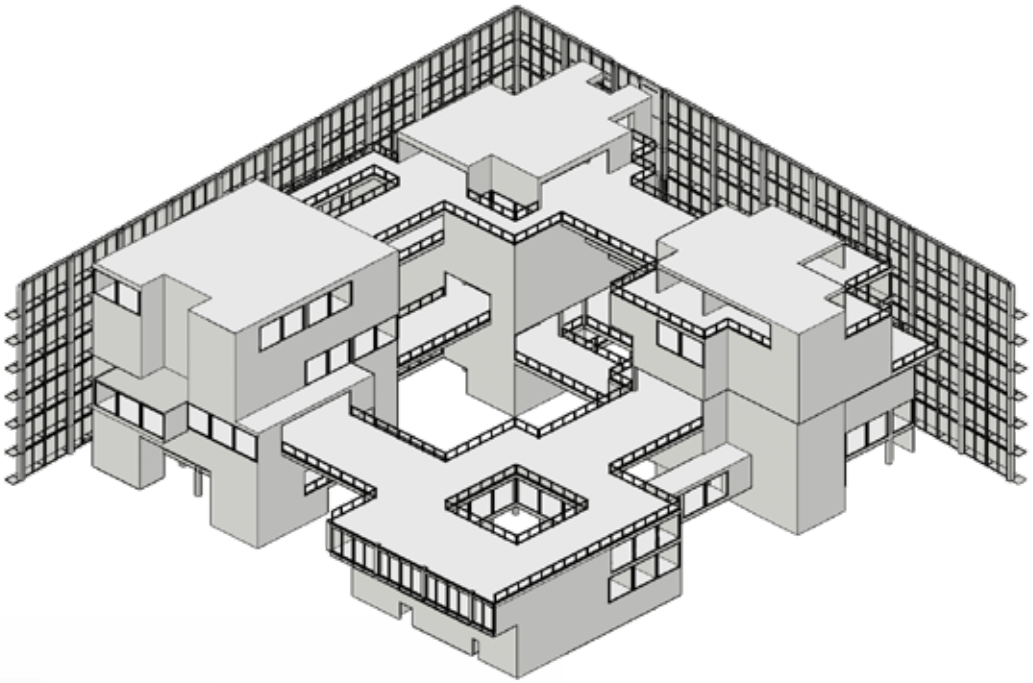
Reclaimed Matter Museum

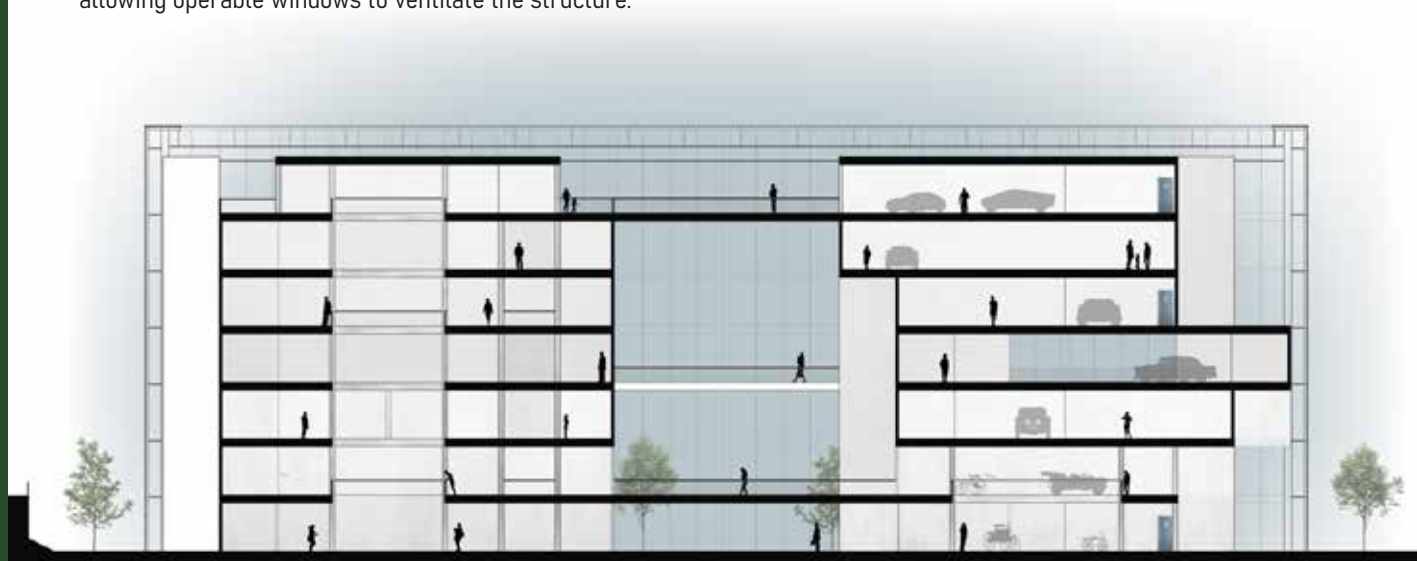
Albuquerque, NM, USA | 401 Studio | Fall 2018

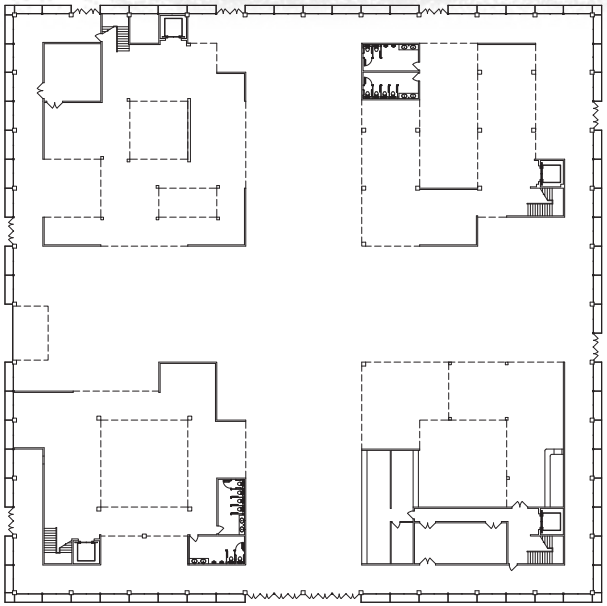
Modern society has a dire issue with consumerism and waste. From many structures to the smallest products, everything is produced with the intention of being replaced later on. As we contemplated the duality of products and waste, of new and old, we were required to incorporate reclaimed matter into a museum of some form.

This museum thrives on the discarding of products, and displays waste as relics of the past. Each of the seven levels of this museum focuses on the era of items within them, with modern relics displayed on the top floor, and aged objects gradually descending to the lower floors.

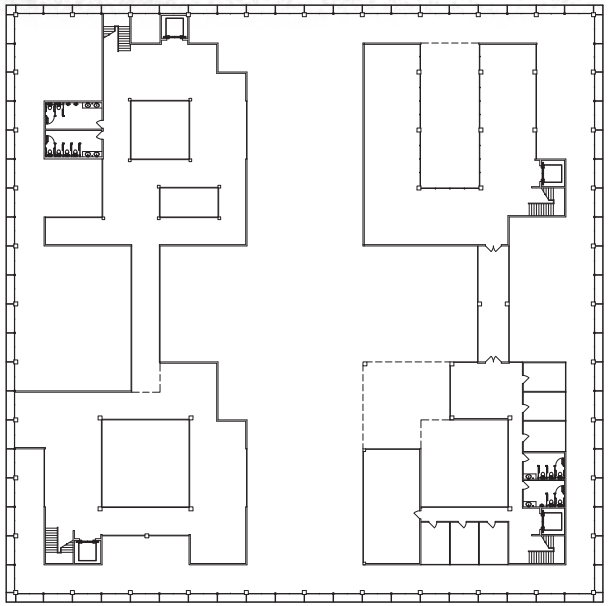
Designed as a cubic matrix distributed as four connected towers, each floor is designed as an individual fragment of time. However, the vertical core through each tower provides patrons a view through time, into the future above, and the past below them. The entire structure is encapsulated with a perforated skin, to allow natural light into the building and allowing operable windows to ventilate the structure.



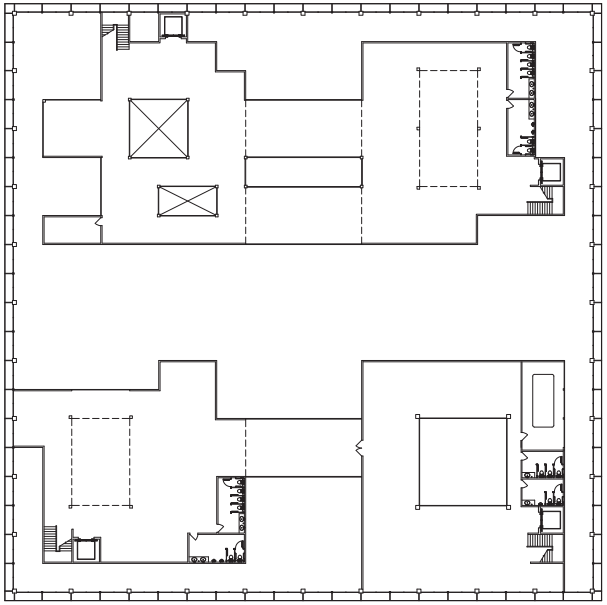




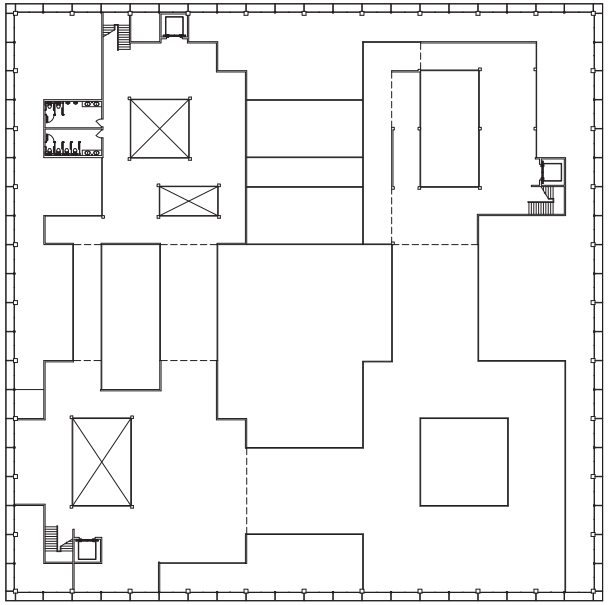
First Floor Plan



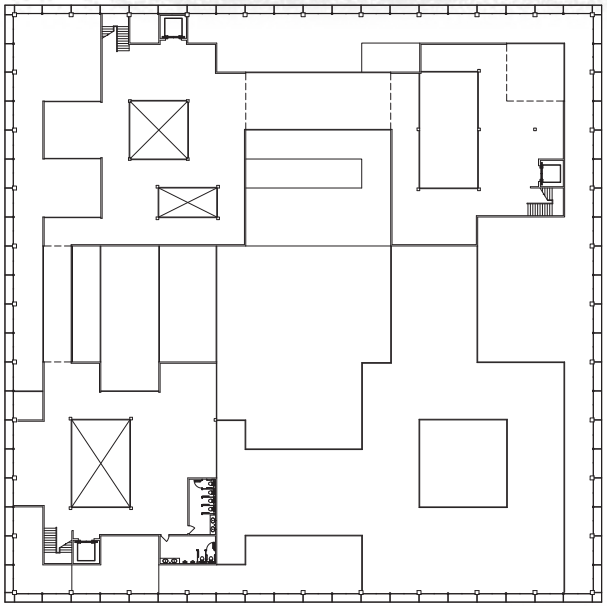
Second Floor Plan



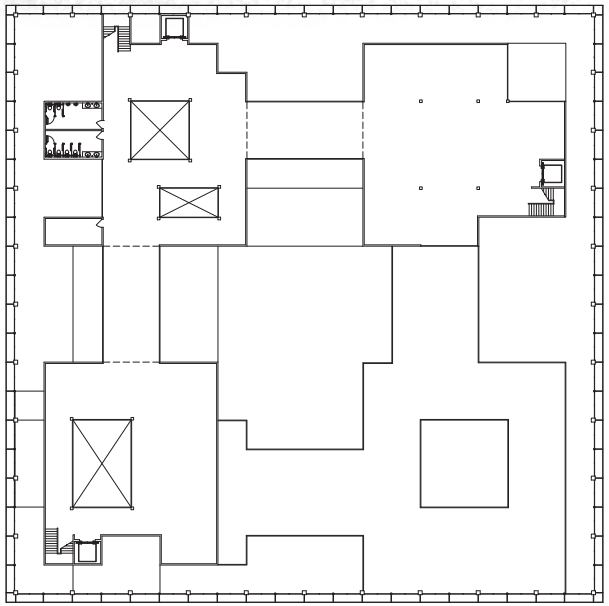
Third Floor Plan



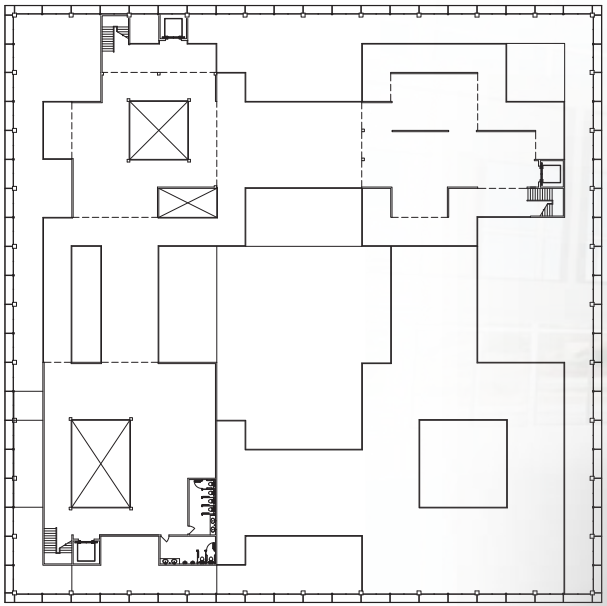
Fourth Floor Plan



Fifth Floor Plan



Sixth Floor Plan



Seventh Floor Plan

Waterfront Dwellings

Reykjavik, Iceland | 302 Studio | Spring 2018

Reykjavik is currently booming culturally and economically, bringing in exponential increases in tourism over the past several years. Since the addition of the Harpa Concert Hall in 2011, the waterfront of Reykjavik has been evolving from an industrial port to a tourist friendly creative arts district.

The Waterfront Dwellings serve two purposes: to provide new waterfront housing for long-term residents, and as a library and bookstore, providing a comfortable space to read, reflect, and recharge on your waterfront walk.

PROJECT DATA

Reykjavik, Iceland

105 Units

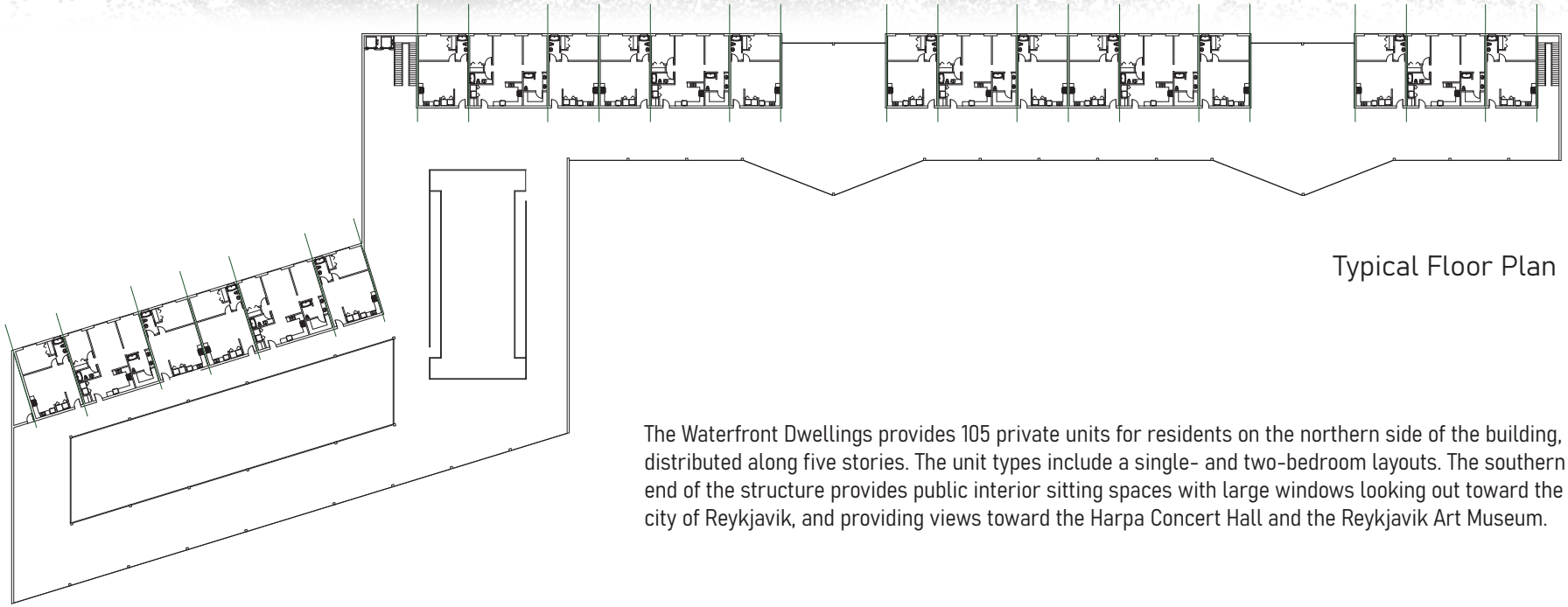
35 Two Bedroom Units

110 m^3 , 1 bathroom

70 One Bedroom Units

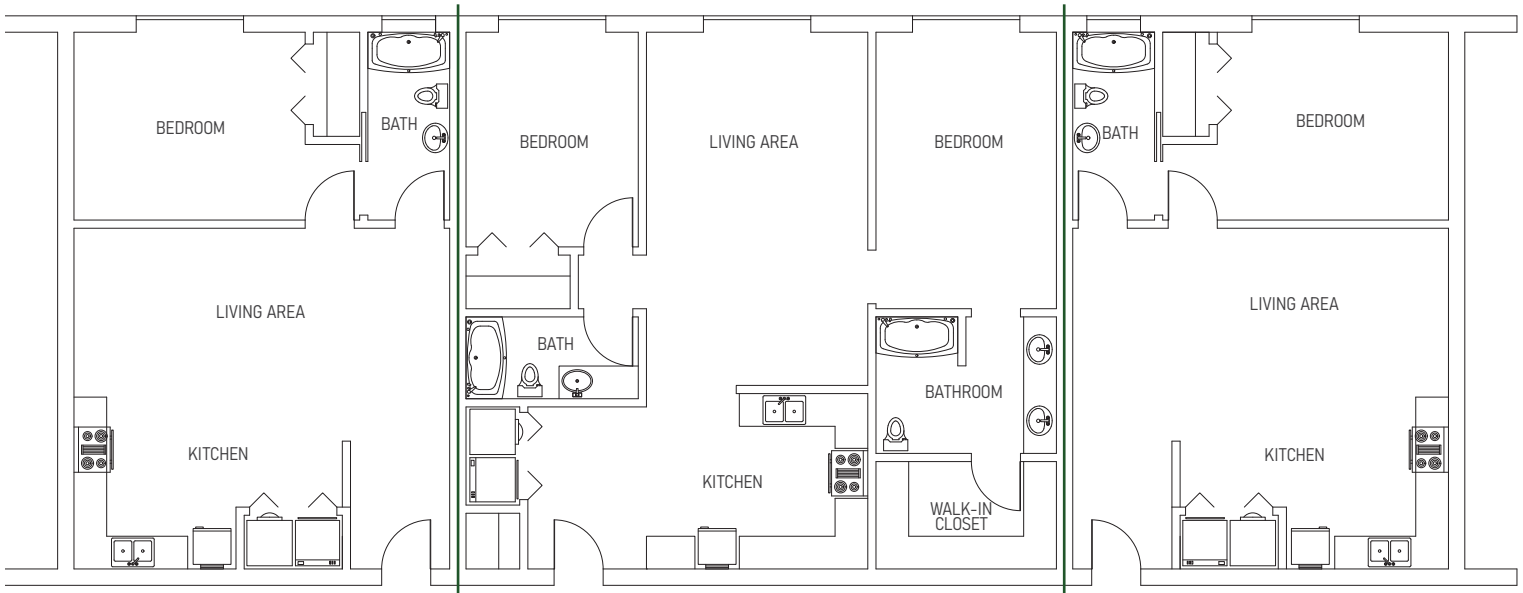
70 m^3 , 1 bathroom

31,350 total m^3



Typical Floor Plan

The Waterfront Dwellings provides 105 private units for residents on the northern side of the building, distributed along five stories. The unit types include a single- and two-bedroom layouts. The southern end of the structure provides public interior sitting spaces with large windows looking out toward the city of Reykjavik, and providing views toward the Harpa Concert Hall and the Reykjavik Art Museum.



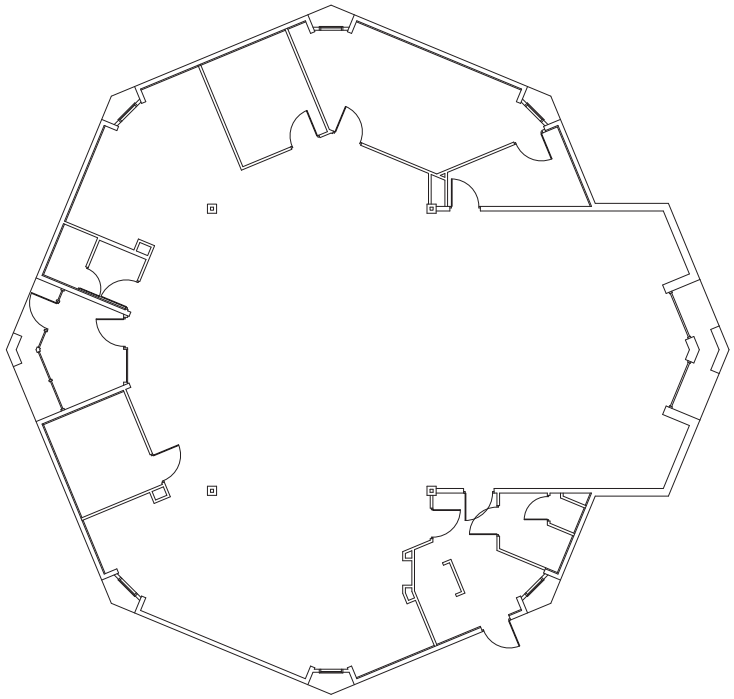
Single-Bedroom Unit Plan | Two-Bedroom Unit Plan | Single-Bedroom Unit Plan

St. Scholastica Academy

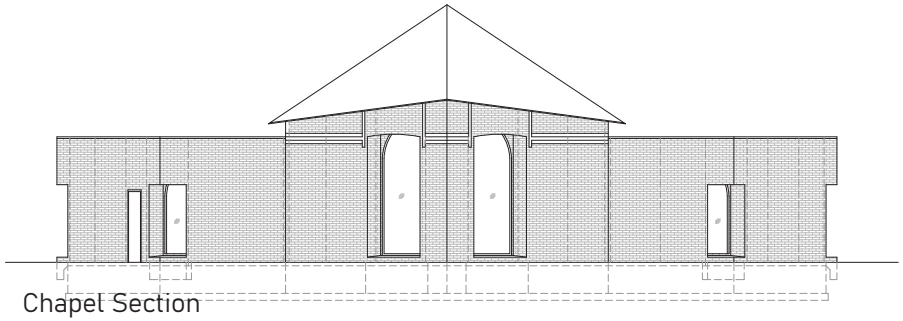
Cañon City, CO | Document Digitization | 2019

The St. Scholastica Academy in Cañon City, Colorado was originally an all-women Catholic academy, with the first structure erected in 1897. Over the many decades that have passed, several new structures have been built, but the campus has been unused since 2008.

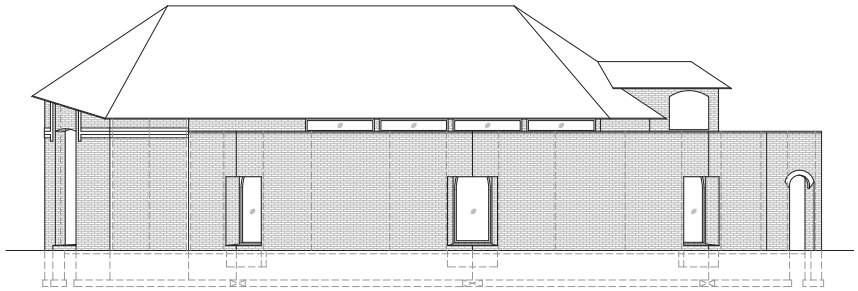
Recently, investors have purchased the property, looking to convert the existing structure into a residential community. These drawings were digitally recreated from the original drawings of the Chapel and Classroom buildings (1970s), completed for the principal architect as baseline for the conversion of the property into a residential complex.



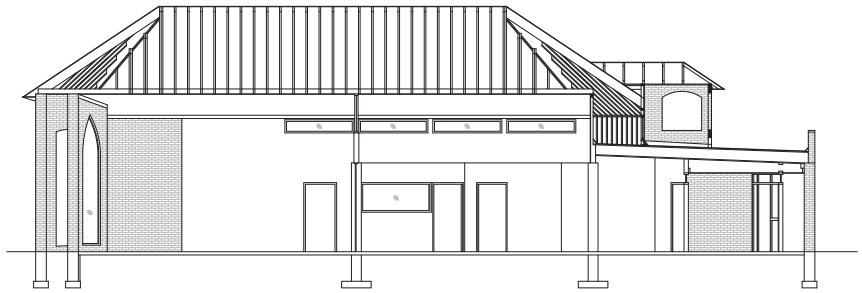
Chapel Floor Plan



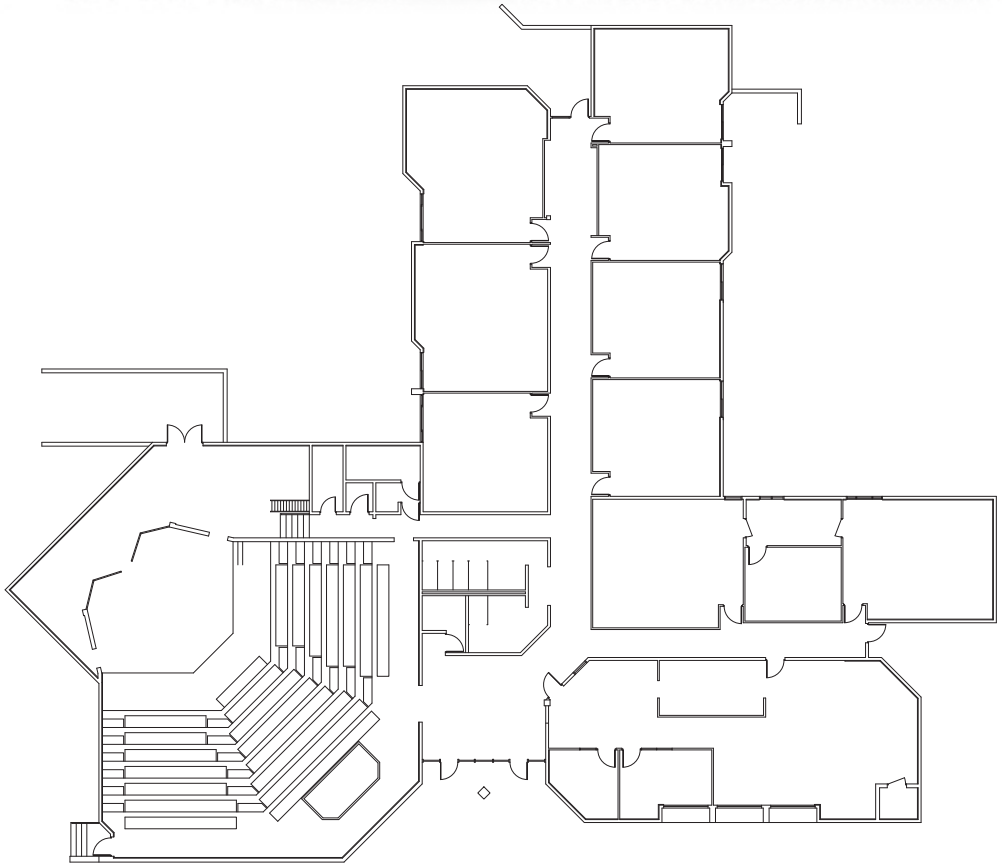
Chapel Section



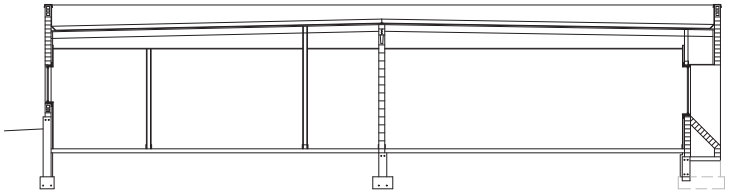
Chapel Section



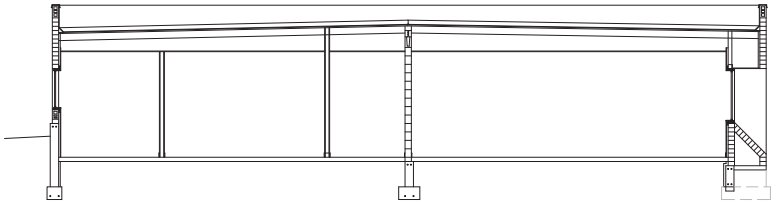
Chapel Section



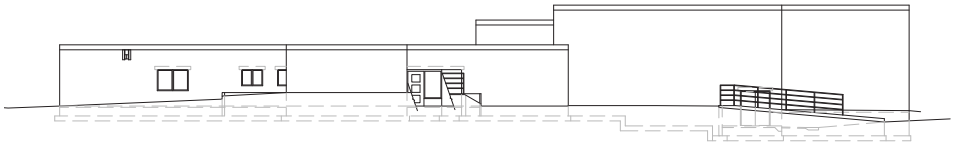
Classroom Building Floor Plan



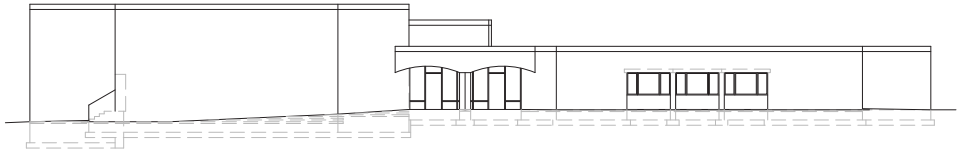
Theater Loft Section



Lab Section



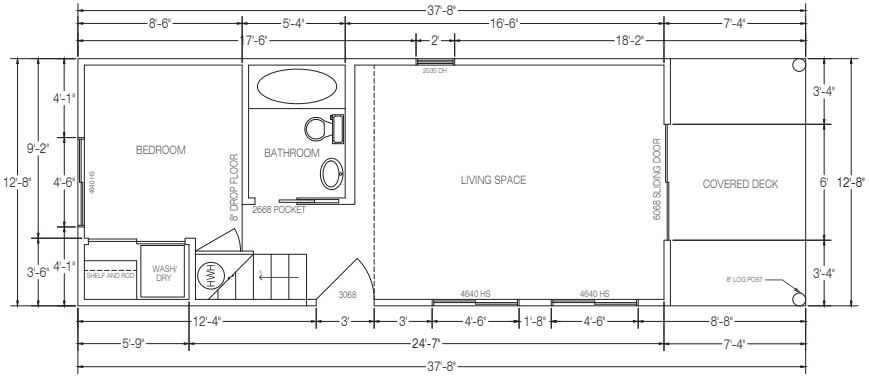
West Elevation



East Elevation

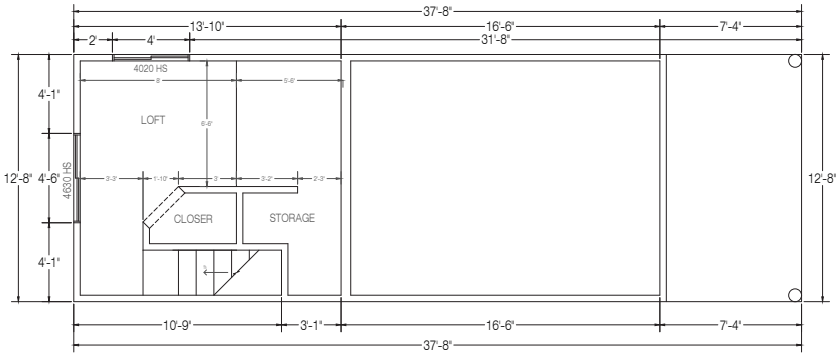
RMC Tiny House

Tiger Run Resort, Breckenridge, CO | 2020



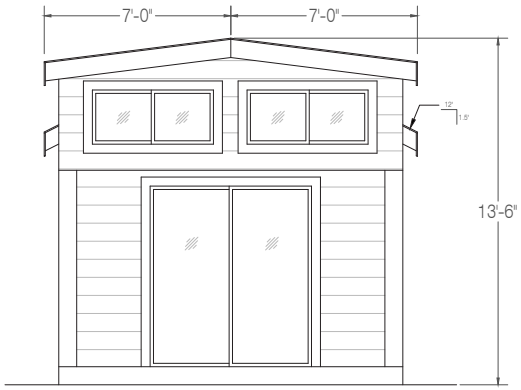
1 A1 FIRST FLOOR PLAN

1/4" = 1'-0"



2 A1 LOFT FLOOR PLAN

1/4" = 1'-0"



3 A2 RIGHT SIDE ELEVATION

1/2" = 1'-0"

4 A2 FRONT ELEVATION

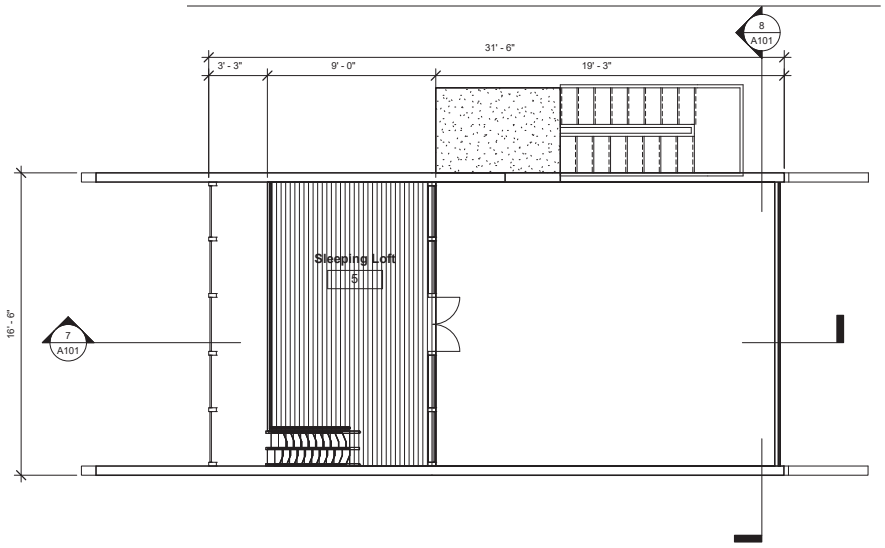
1/2" = 1'-0"

West Coast Tiny House

Autodesk Revit | 472 Intro to Revit | Fall 2019

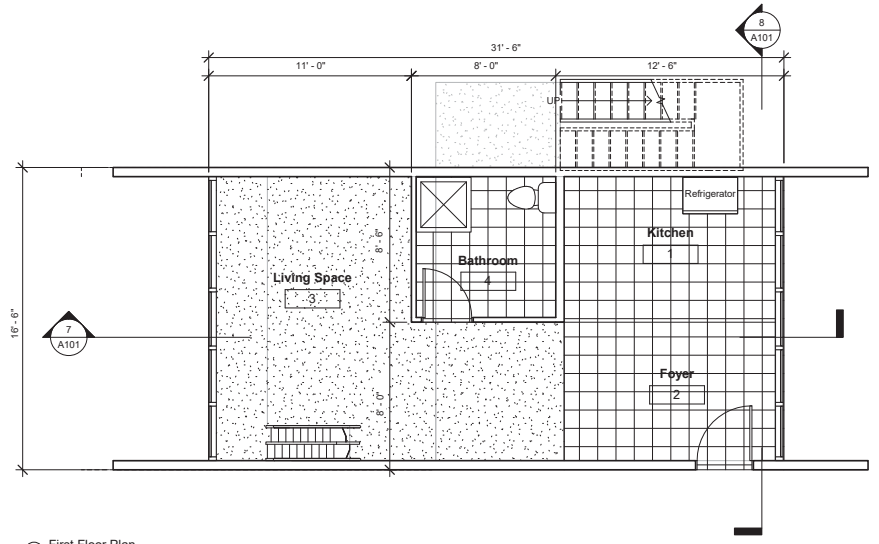
During a short, half-term course at UNM, students were required to design and create a tiny house utilizing skills in Revit. This contemporary west-coast residence was designed with two monolithic walls on the north and south faces, with glazing on the east and west to provide substantial natural lighting.

The tangent circle form of the concrete walls provides a unique contour for the structure, as well as private interior and exterior space on the upper level. The loft also allows for a continuity throughout the structure, giving the “tiny” space a much more spacious feel.

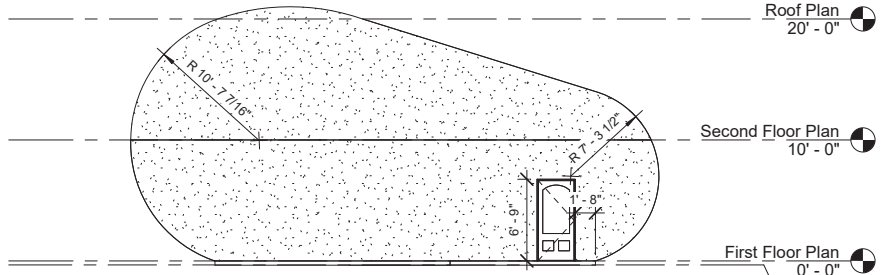


② Second Floor Plan
1/4" = 1'-0"

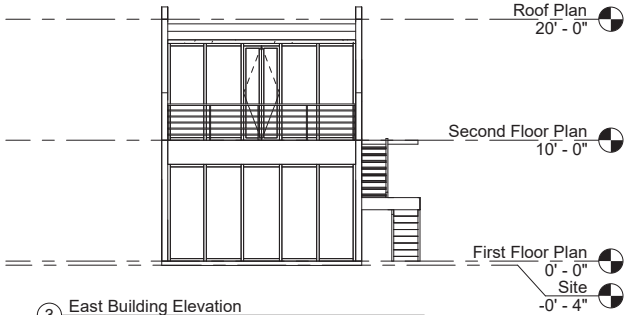
⑨ Section Perspective



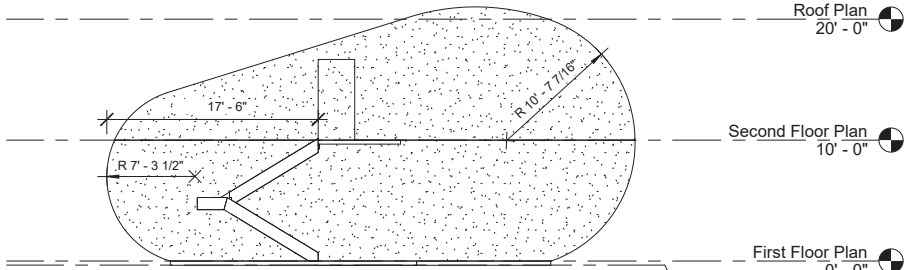
① First Floor Plan
1/4" = 1'-0"



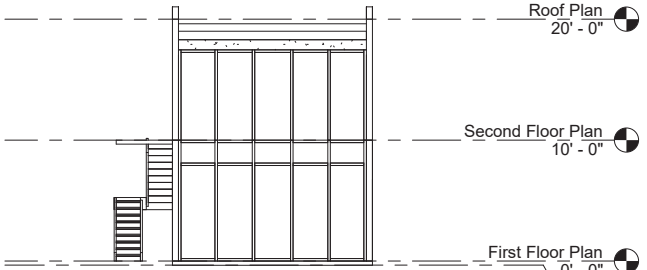
5 South Building Elevation
1/8" = 1'-0"



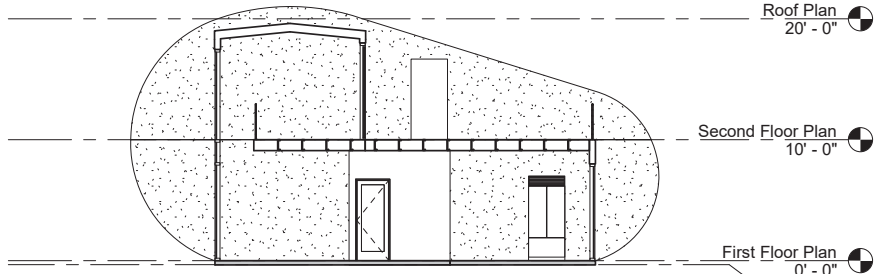
3 East Building Elevation
1/8" = 1'-0"



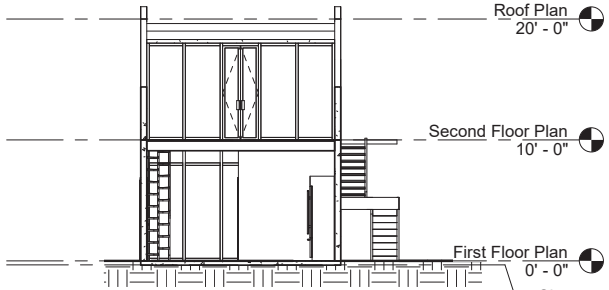
4 North Building Elevation
1/8" = 1'-0"



6 West Building Elevation
1/8" = 1'-0"



7 Section Looking North
1/8" = 1'-0"



8 Section Looking West
1/8" = 1'-0"

Fluid Motion Maya Study

Autodesk Maya Animation | 301 Studio | Fall 2017

In preparation for a future project, our instructors had the students study the physical shape, space, and motion of a part of the human body. For this investigation, the lungs were studied and conceptualized as fluid motion in space. In order to represent the moving fluid as visual space, a simulation of smoke spreading and billowing into a space was created in the program Maya.

Once the initial animation was created (pictured below), it was still difficult to distill the smoke into physical space, with solid and void volumes. To generate this, thousands of individual, spherical particles were added to the animation, and made to follow the motion of the smoke. The resulting particle arrangement allowed for better interpretation of solid and void spaces created by the fluid motion (pictured right).

This particle arrangement was later imported to Mudbox, where the particle density was sculpted into a single solid form, which influenced the form and spaces of a project later in the semester.