COLLEEN DUONG

Bachelor of Architecture | 2021
Carnegie Mellon University

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CONTENTS

COLLEEN DUONG
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EDUCATION

Carnegie Mellon University (CMU)
Pittsburgh, PA
Bachelor of Architecture
2016 - Present
Class of 2021
GPA 3.14/4.00

SKILLS

Software
Adobe Photoshop, Illustrator, Indesign, Premiere, After Effects; MS Office, Rhinoceros 5/6, AutoCAD, Solidworks, RobotStudio, AutoDesk Maya, ZBrush, 130 WPM

Fabrication
CNC Machining (Mill and Lathe), Woodwork, Lasercutting, 3D Printing, Industrial Robot Arm

Analog
Drafting, Model Making, Drawing

Programming
P5JS, Javascript, HTML, Basic Python

RELATED COURSES

Architectural Studios, Analog and Digital Media, Fundamentals of Computational Design, Materials and Assembly, Computing for Creative Practices, Rapid Prototyping, Introduction to Architectural Robotics, Mobile Web Design

WORK EXPERIENCE

Carnegie Mellon University - Professor Joshua Bard *Spring 2019 - Present*
Research Assistant
• Explore robotic steambending wood properties to design and fabricate five steam bent swings as part of the Hazelwood Green development plan.

Leadership Enterprise for a Diverse America *Fall 2017 - Spring 2018*
LEDA Peer Mentor
• Mentor incoming LEDA first-year college students through hosting monthly meetings.

Carnegie Mellon University Pittsburgh, PA *April 2017 - October 2018*
CMU Ambassador
• Connect with alumni, parents, and friends of the University to gain an understanding of how their college experience shaped their lives.
• Develop strategies to encourage new or increased participations.

ACTIVITIES

Alpha Phi Omega Kappa Chapter, Carnegie Mellon Pittsburgh, PA
August 2018 - Present
Assistant FellVP (Spring 2019)
• Attend weekly meetings to plan out activities that promotes friendship within the fraternity.
Spring Booth Committee Chair (Spring 2019)
• Prepare construction details for the upcoming CMU Carnival Spring Booth Concessions event.
PR/Rush Design Team (Spring 2019)
• Design posters, calendars, stickers and t-shirts for the fraternity.

Habitat for Humanity, Carnegie Mellon Houston, TX *January 2018*
• Constructed houses with the hurricane relief program in Texas after recent events with Hurricane Harvey.

LEDA Career Fellow Providence, RI *August 2017*
Fellow
• Attended workshops that developed hard and soft skills, leadership skills, professional network, and offered exposure to new opportunities.

Robotics Team, Team Kika Mana #368 Honolulu, HI *Fall 2012 - Spring 2016*
Captain (Fall 2014 - Spring 2016)
• Prepared presentations for meetings, scheduled team events, and wrote grant proposals.
Coach (Spring 2015)
• Coached the team to Einstein Field at the 2015 FIRST Robotics World Championship; this marked the first time a Hawaiian Robotics Team ever made it to the Einstein Field.

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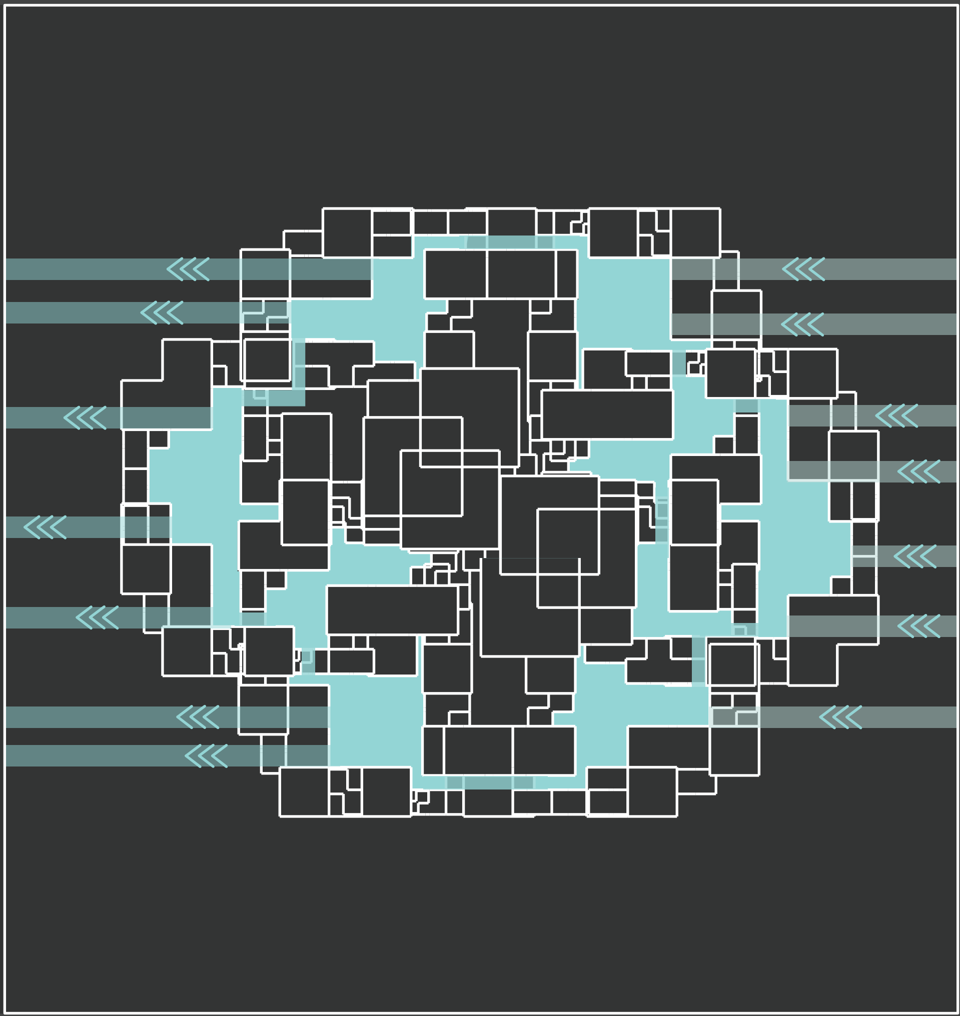
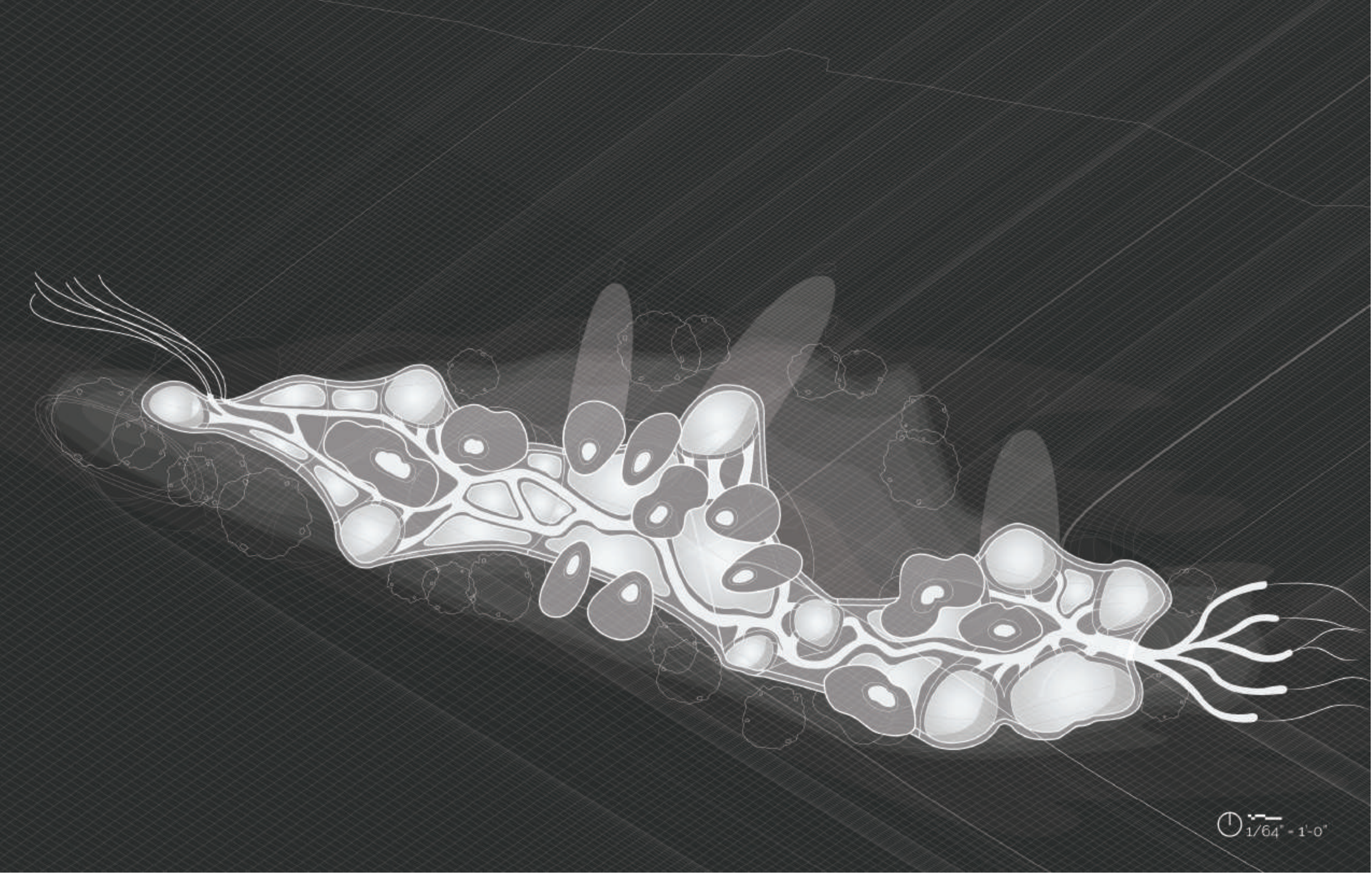
Six Mile Island
Eco-machine Co-Housing



Six Mile Island, Sharpsburg, PA
Integration_Studios
Dana Cupkova & Matthew Huber
Fall 2018

Students developed urbanization strategies to create co-housing and eco-machine prototypes onto the site. The project began by allowing students to develop an understanding and focused knowledge of a specific system's behavior and logic to get a clear understanding of how it could be incorporated into the site and integrated into the lives of those living there. The goal of this design was to design a large biofiltration system that would take water from the Allegheny River, clean it, and return it back to the river. The biofiltration system aims to use streams, waterfalls, and greenwalls to treat the water.



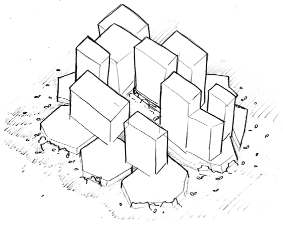
ISLAND OVER TIME

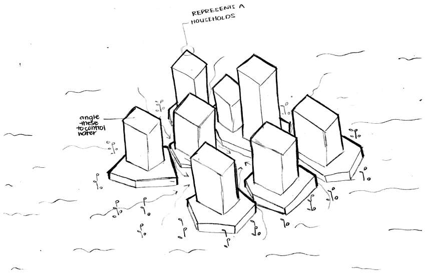
Over time the island will start to grow smaller and smaller (with the rising sea levels and erosion), but the architecture aims to still stay standing even as the island begins to fade away into the river. The architectural form was carved through a wind analysis on the island.

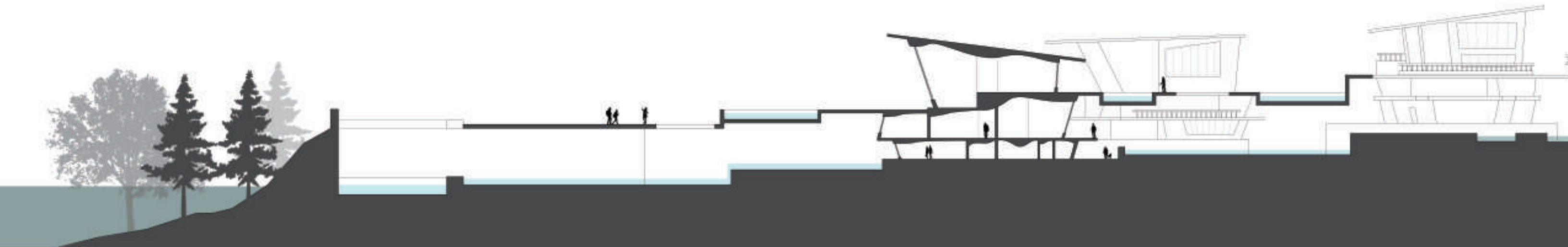
SITE PLAN TOP LEVEL

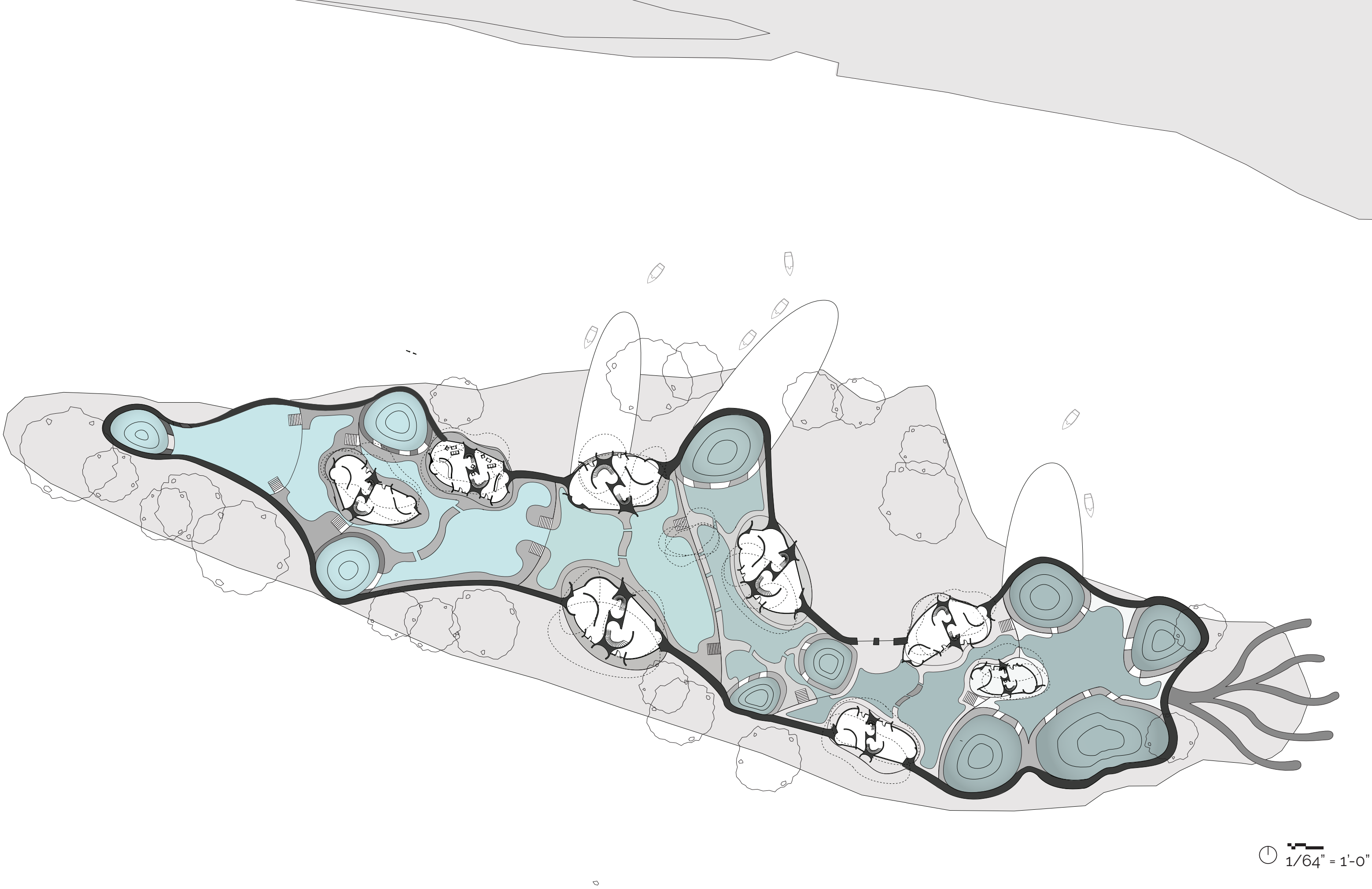
Series of streams and openings that help guide the water through the structure and allow water to fall through the top and into the bottom layer of the system. The pump at the beginning tries to mimic the appearance of water flow streams and helps bring water into the system.

The image below displays a series of initial sketches that conveyed the idea of using streams to dictate paths and circulation of the water and the residents moving.









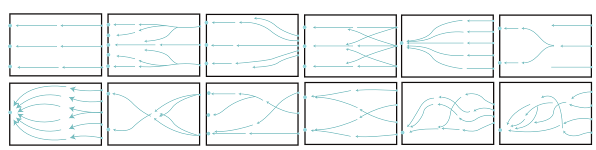
SITE PLAN BOTTOM LEVEL

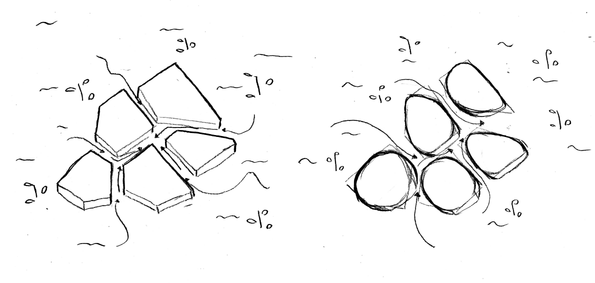
The bottom level of the system consists of a series of large pools that are surrounded by walkways to allow for residents to get into their homes. The water from the top level flows into these pools to create a waterfall effect for the residents to experience.

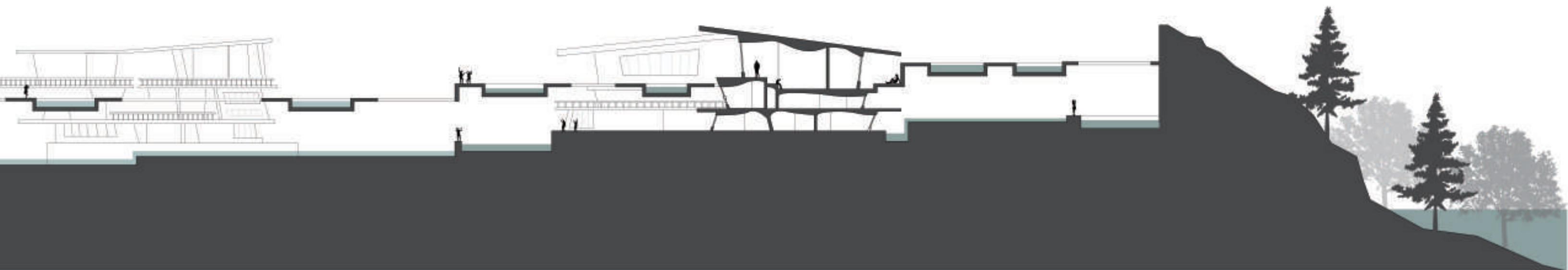
ARCHITECTURAL FORM

The overall architectural form derived from an understanding of how water flows. Water tends to erode sharp turns and likes to free-flow through curved paths, which helped create the final form which mimicked the language of the water's movement.

The image to the right displays a series of diagrammatic studies to understand how water flow patterns can be affected by physical objects, like buildings, and help dictate overall form.

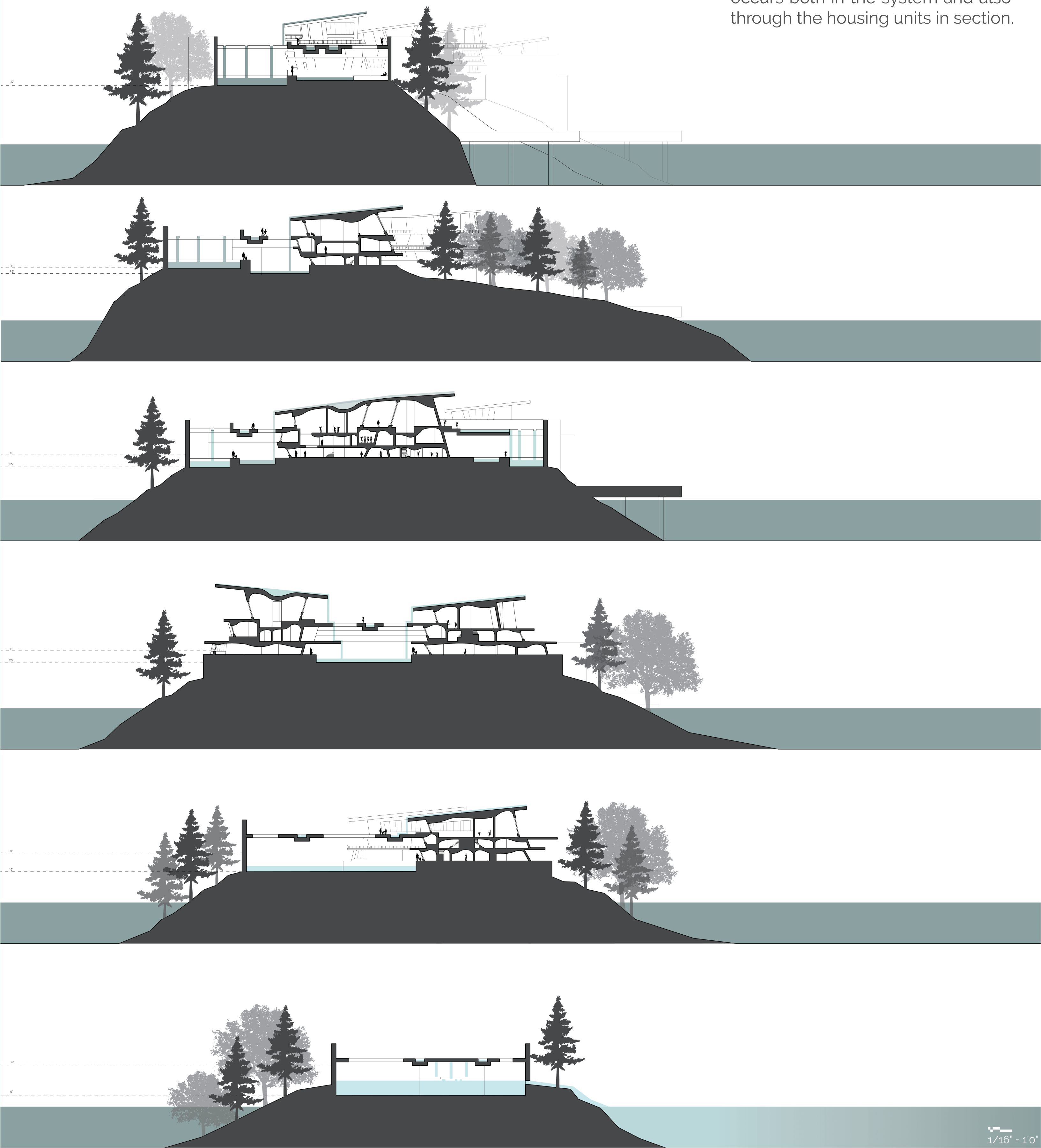






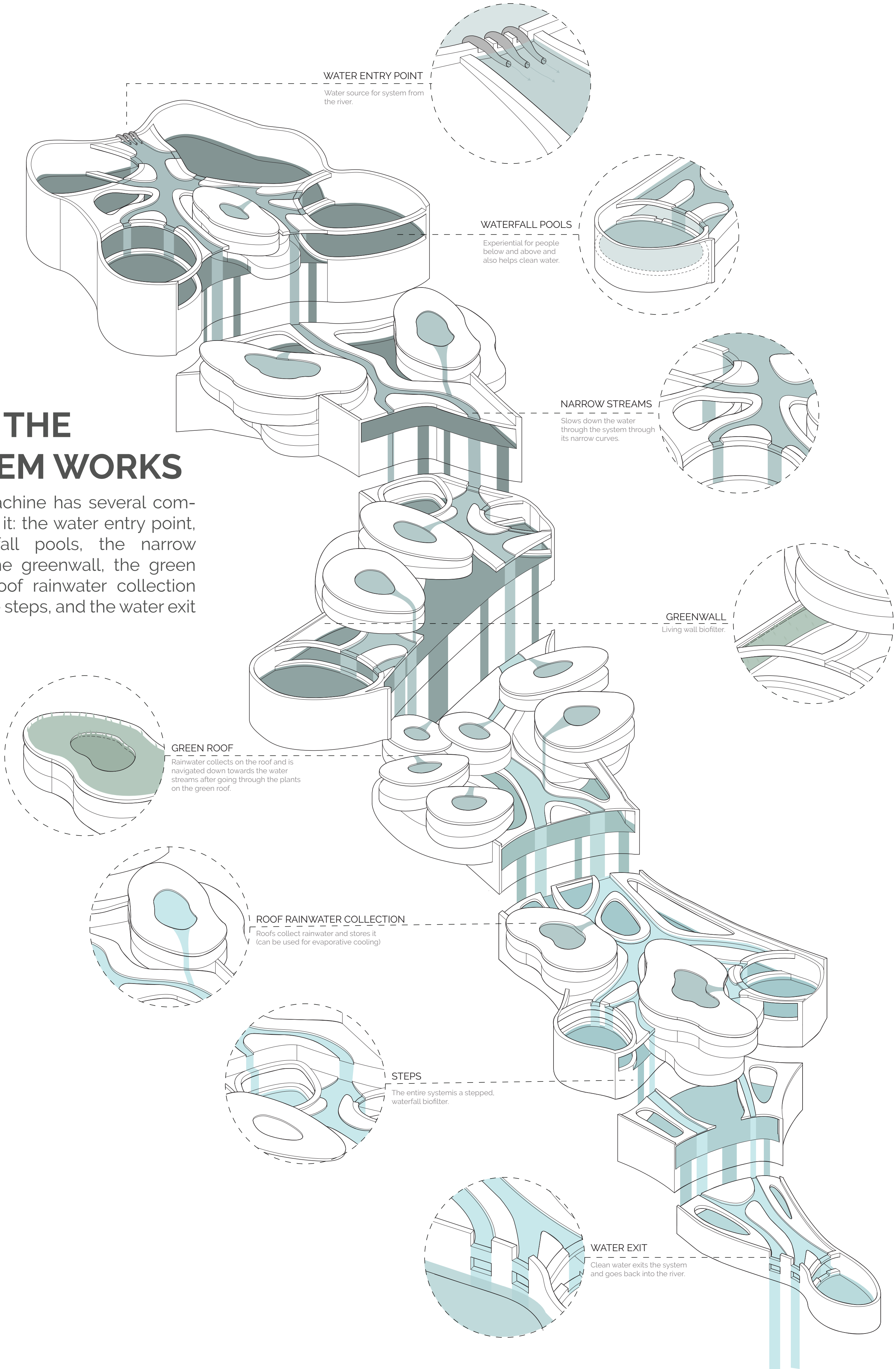
SECTION SERIES

The series of sections help show the main concept of the design, which are the different elevations and steps that occur throughout the system to help clean the water. This occurs both in the system and also through the housing units in section.



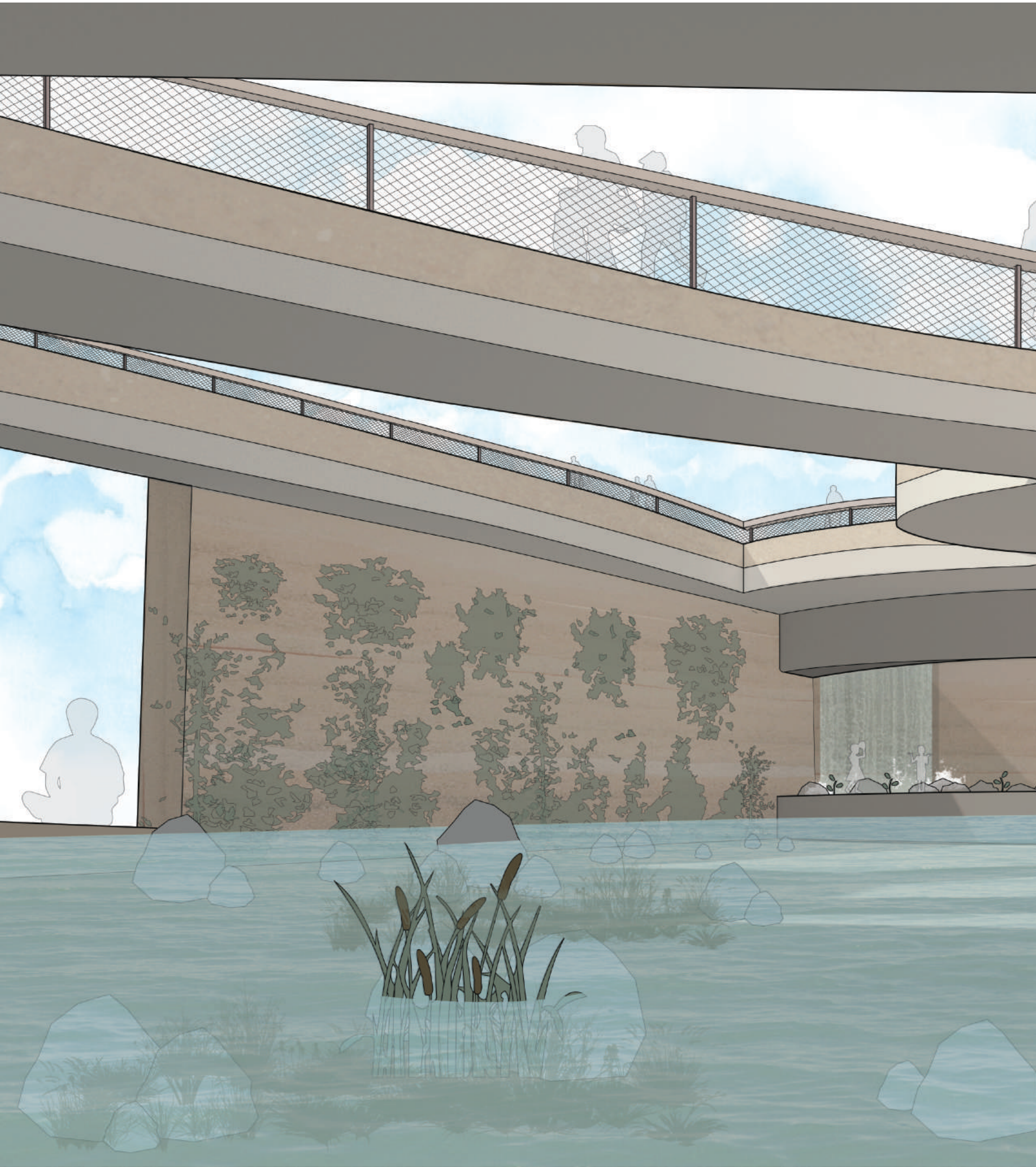
HOW THE SYSTEM WORKS

The ecomachine has several components to it: the water entry point, the waterfall pools, the narrow streams, the greenwall, the green roof, the roof rainwater collection system, the steps, and the water exit point.

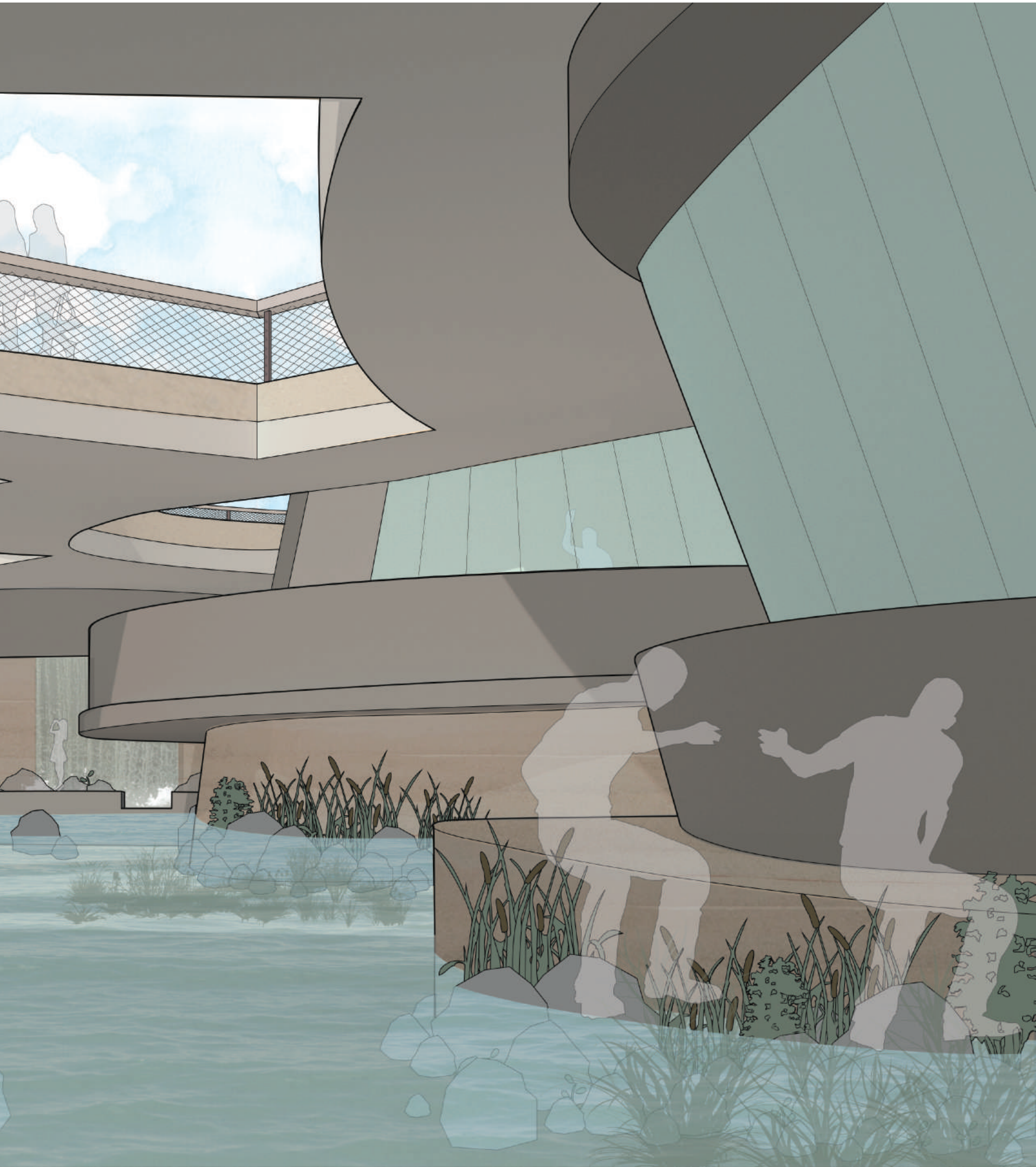


MATERIALITY AND EXPERIENCE

The materiality of the architecture is mainly concrete because the goal of this structure is to make sure it doesn't erode or dissolve with the constant contact with water. However, there is also rammed earth walls and floors that is used in the structure (not the housing units) that would potentially wear away over time, but wouldn't wear away too quickly. This opens the architecture to multiple possibilities of what it could change into or become in the future. The rammed earth material is also used at the top level where residents walk to potentially wear away the streams up above and



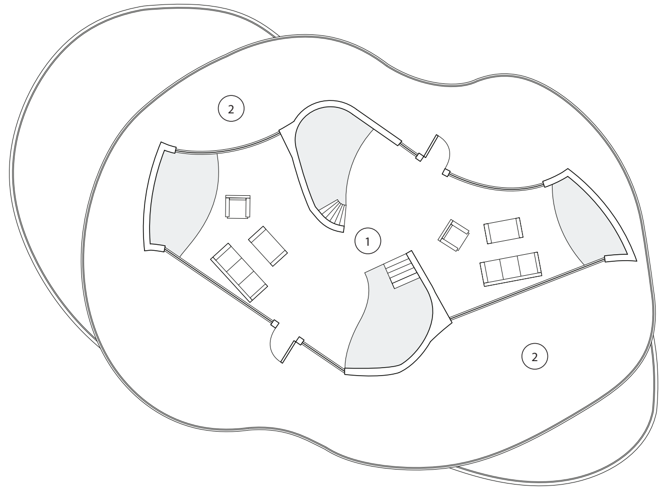
create new water openings that would allow for more water to trickle down into the bottom of the system in the future. Another potential material that couldn't be shown in this perspective view is sand, which enhances the idea of architecture changing over time; this material would be pools or streams to create a certain textured feel for people experiencing the clean water physically.



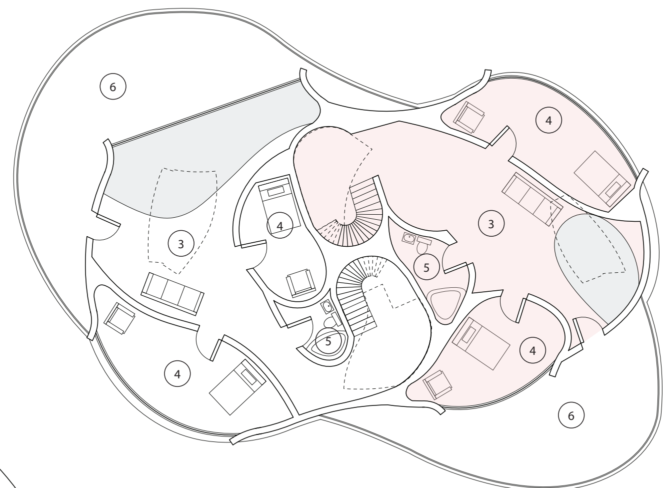
CO-HOUSING PLANS

Each building holds multiple housing units depending on the shape of it. The core of the building consists of stairs that help inform the orientation of each floor; each floor is rotated a specific way (the first floor is rotated to follow waterflow, the second floor is rotated to try and get as much sunlight as possible, and the third floor is shaped by the wind).

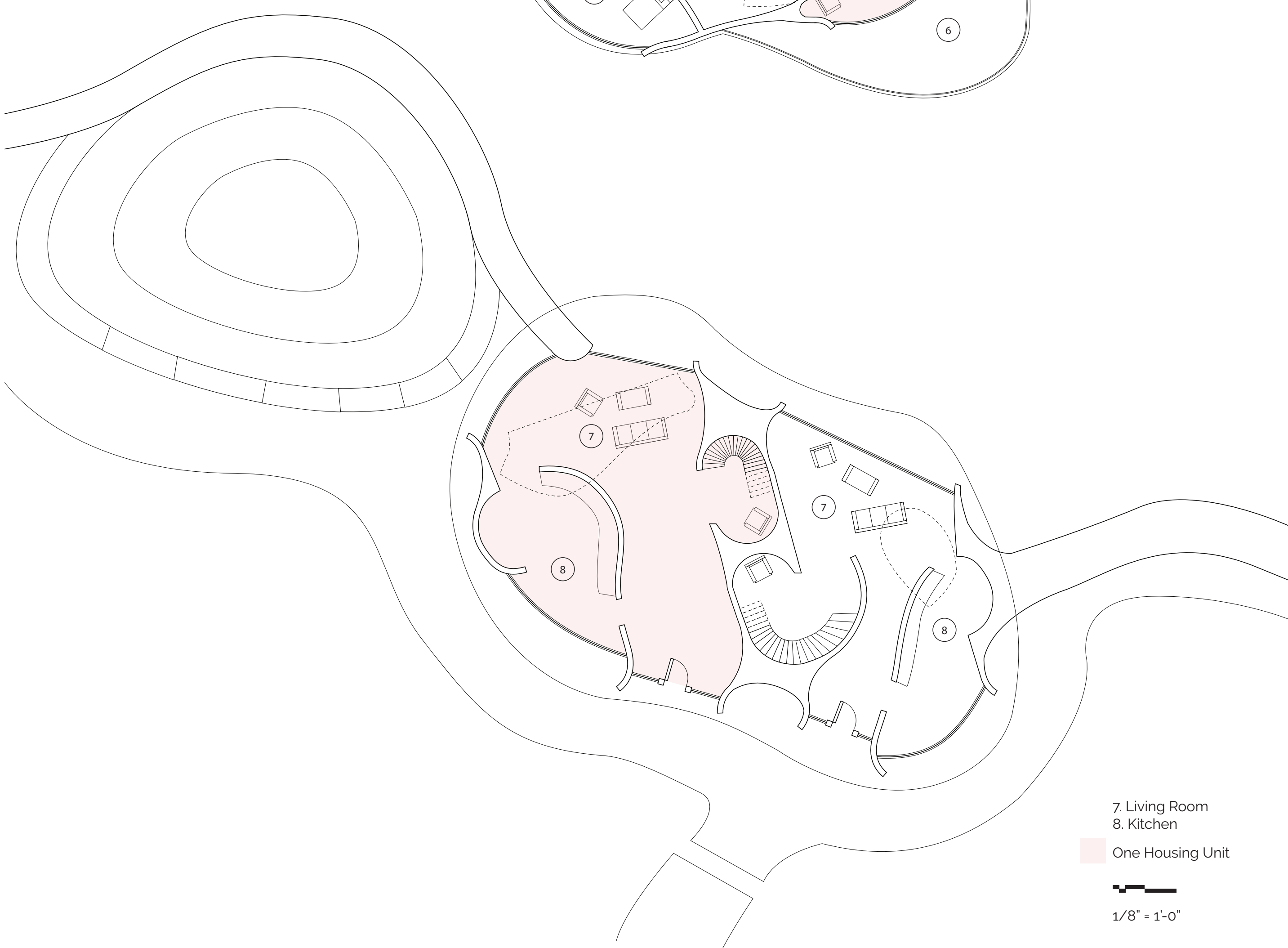
The walls of the unit help inform the circulation flow that someone would walk while going through the house.



1. Shared interior roof (library, relaxing space, etc.)
2. Shared exterior roof



3. Living Space
4. Bedroom
5. Bathroom
6. Balcony



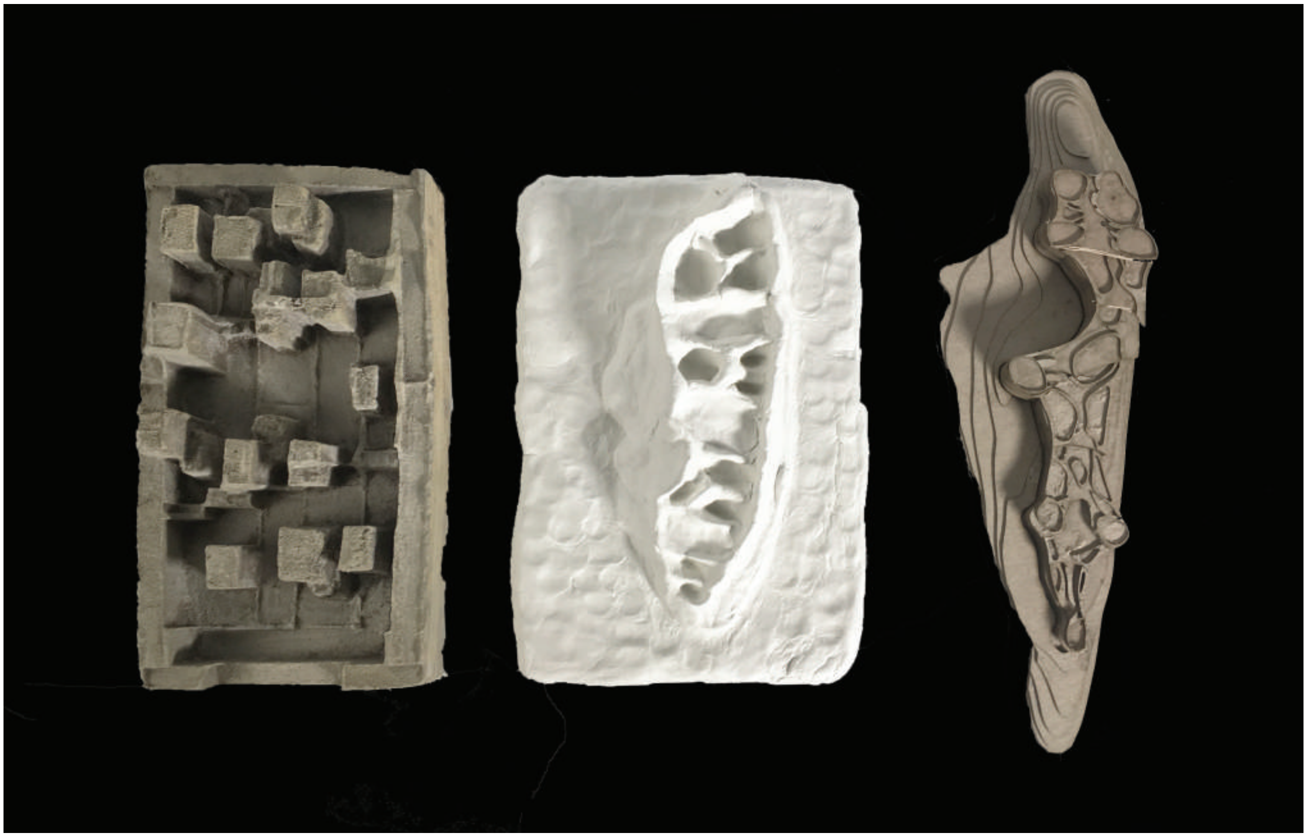
7. Living Room
8. Kitchen

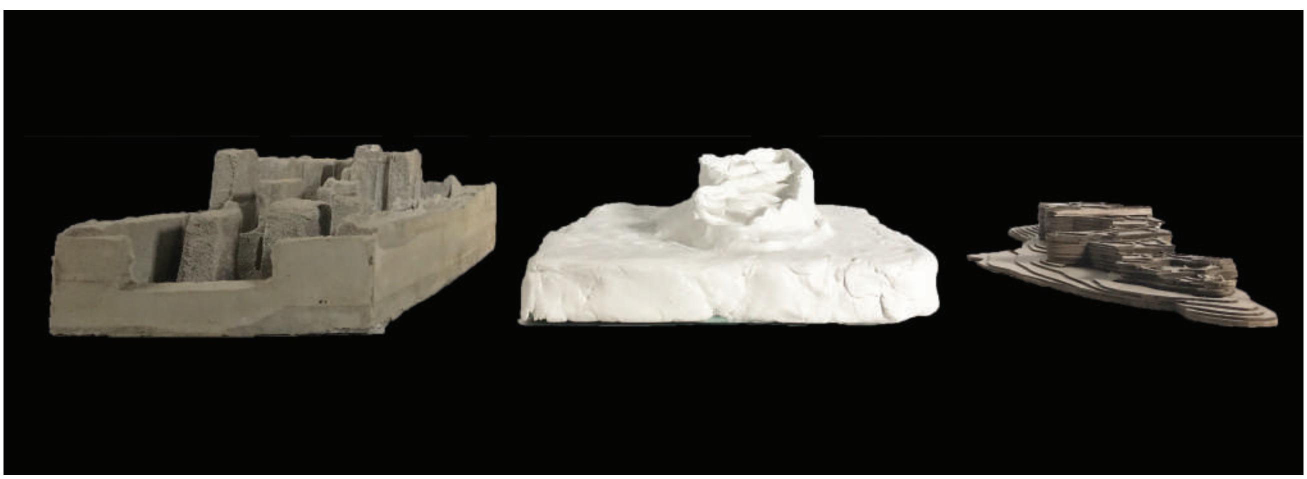
One Housing Unit

1/8" = 1'-0"

MODELS

Below are images of a series of study models that were created throughout the project. The two to the left of the two top images tried to understand the main form of the structure and how it would work in section. The bottom left model focused on a parametric study that looked at how spaces could overlap and intertwine with one another to create certain spaces. The bottom middle model studied how the facade of the building could wrap around the shape of the architecture.





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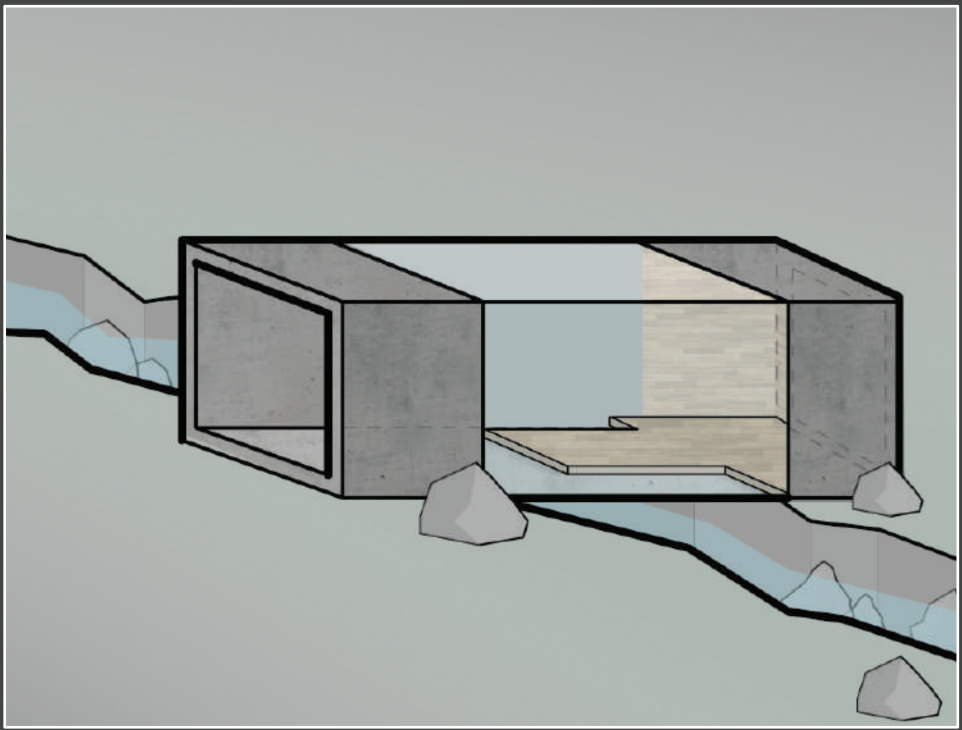
Saco Lake
Bath House

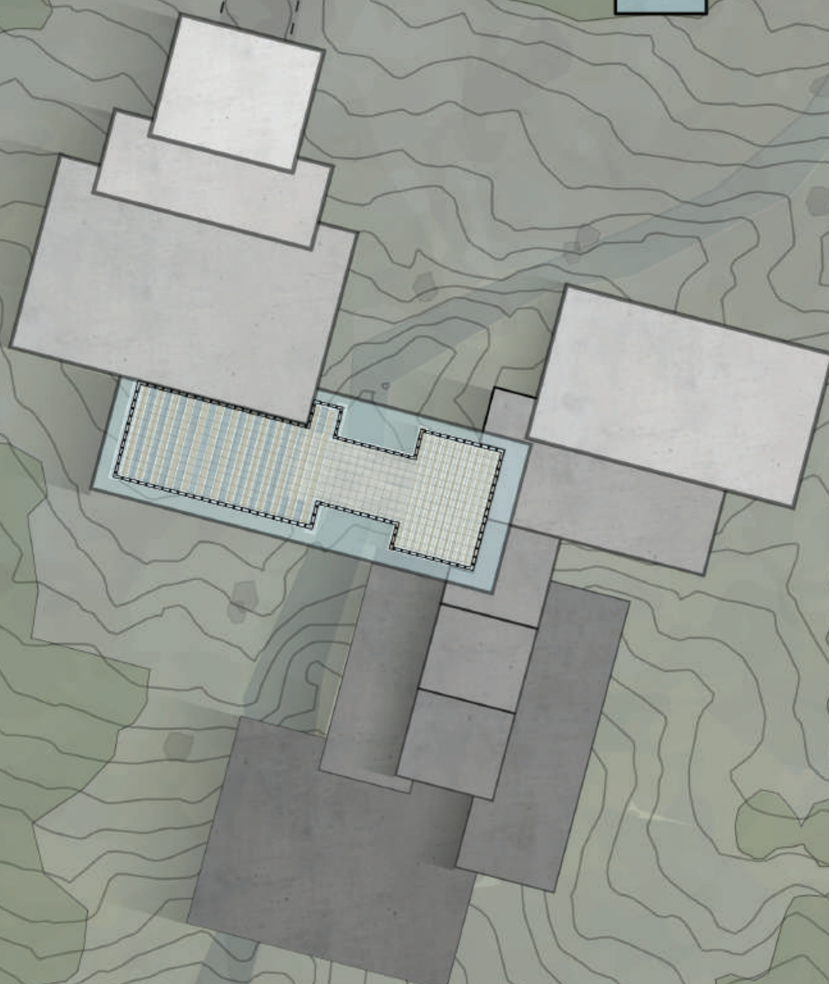


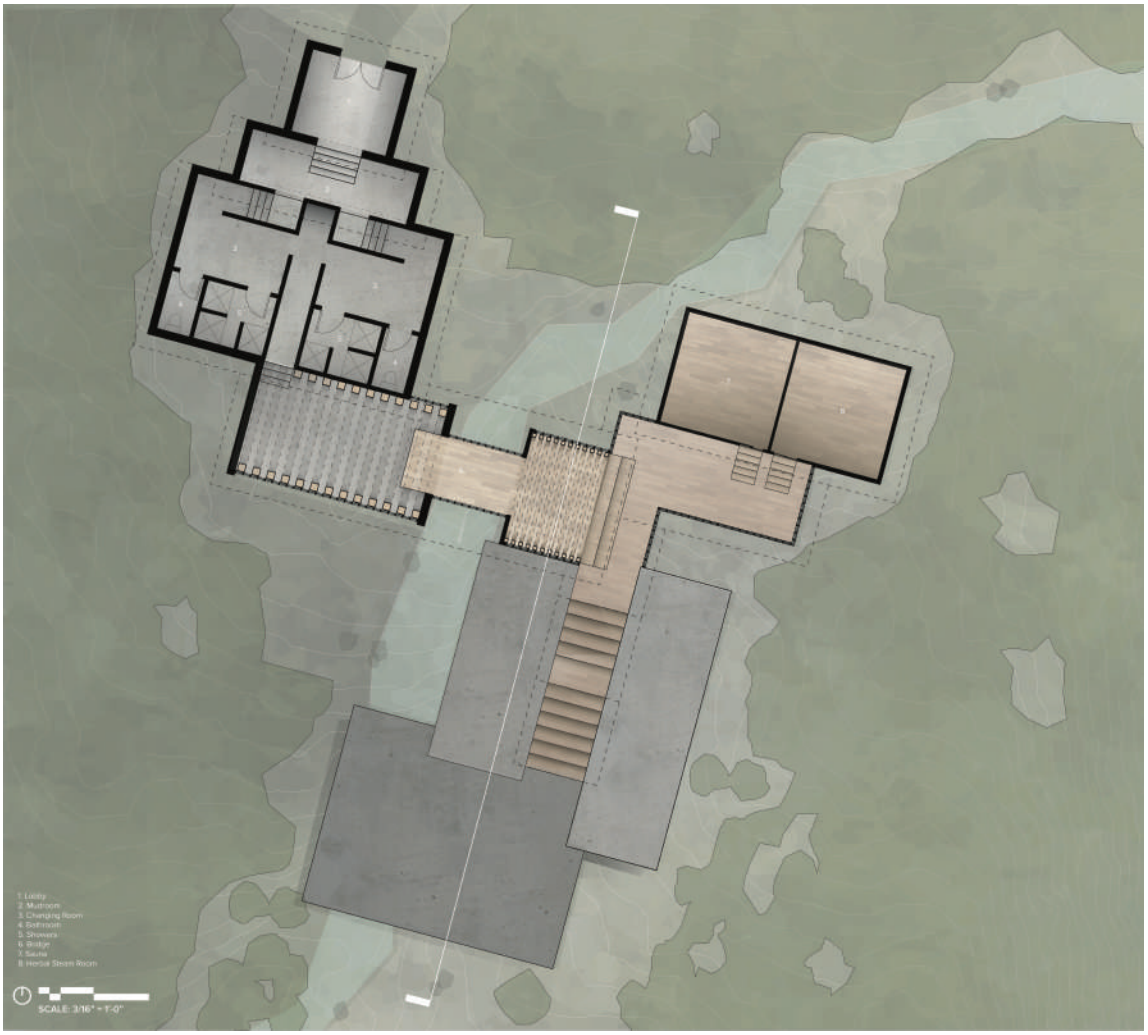
Saco Lake, Carrol, NH
Elaboration_Studios
Jeremy Ficca & Jeff King
Spring 2018

Design proposal for a bath house that incorporates the ideas of "lightness" and "heaviness" through the use of wood and concrete as a building material. The stream was used to emphasize a feeling of crossing over to experience architecture that is entirely different. This is created through a bridge, allowing users to cross the stream and experience the bath house.

FALLING STEPS

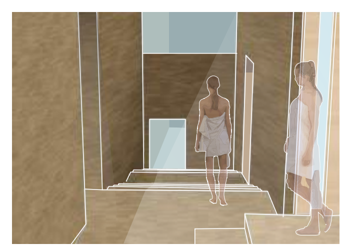
The site is surrounded by four boundary conditions: the road (Crawford Notch Road), the hiking trail (Crawford Path), a stream, and Saco Lake. The elevation also drastically changes throughout the landscape from Saco River to Crawford Path. The main focus of this design was to emphasize the idea of four different experiences after crossing the bridge to create multiple levels of involvement with the stream for the visitors. The first level, the bridge, allows the visitor to see the stream to the right and left of them. The second level, the warm bath, allows the visitor to see the stream and feel as though they are in the stream by having only a glass wall separating them from the stream. The third level, the cold bath, allows the visitor to hear the stream. The last level, the hot bath, allows the visitor to hear the stream, see the stream, and feel as though they are in the stream. The cold and hot baths are situated in a space that has the stream running through the room. This allows them to hear the stream water flowing down the site.





SITE PLAN TOP LEVEL

The bath house before the stream is made entirely out of concrete in the interior and is symmetrical to emphasize a heavy design feeling. The program consists of the lobby, mudroom, changing room, the showers, and the bathrooms. The building after the stream is made entirely out of wood to create a lighter feeling. This is emphasized by the wooden bridge that sits on top of the concrete floor before the stream. This side of the building consists of the different termperatured baths.



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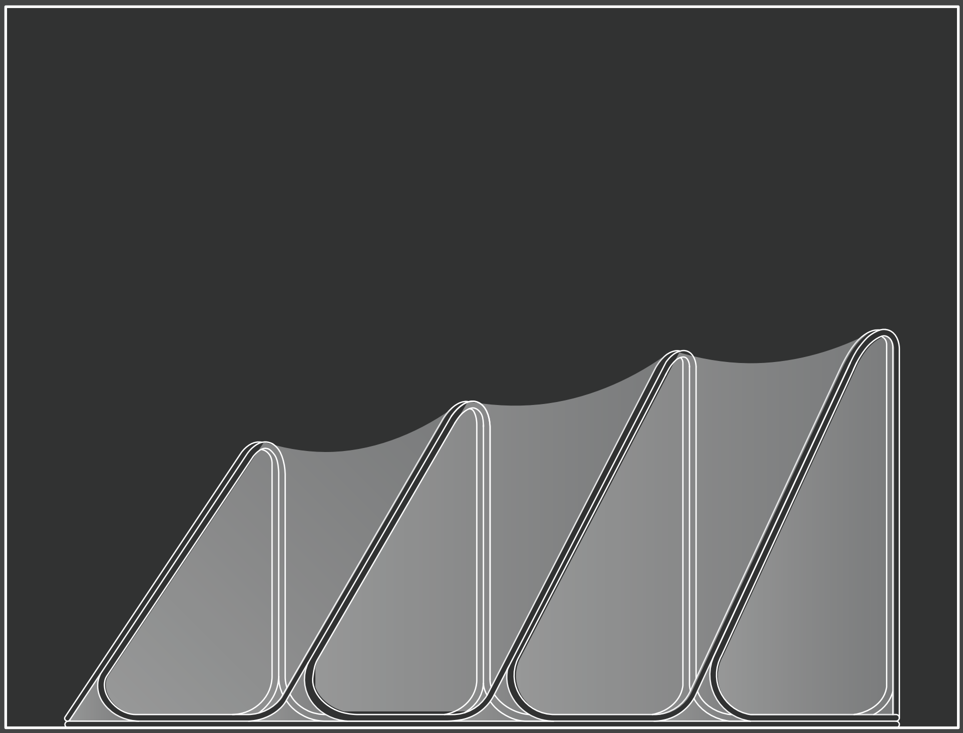
Hoop House
Just ‘Duit

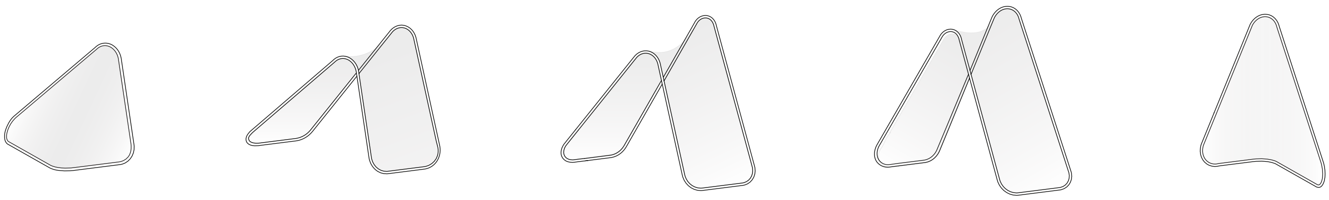


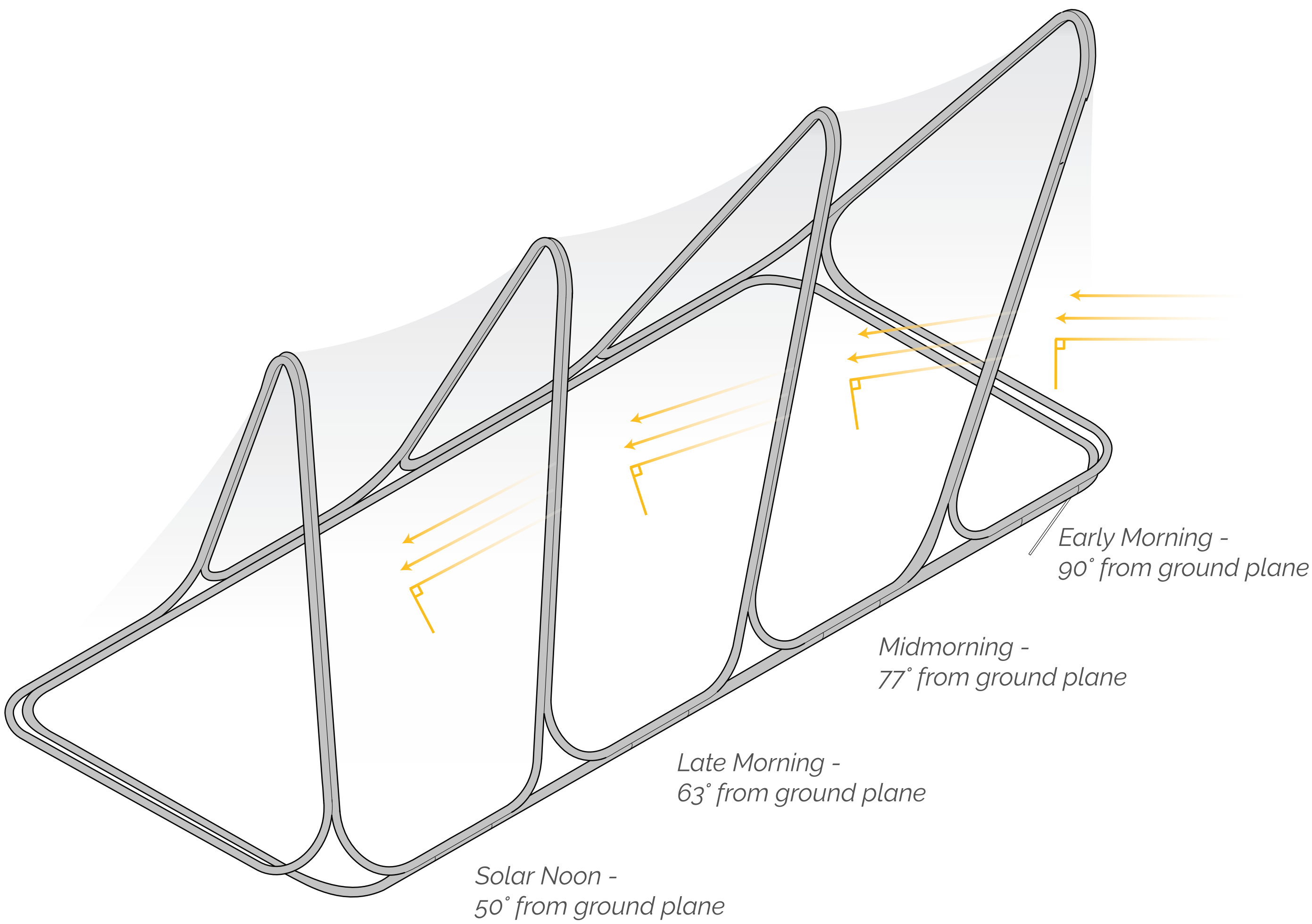
Phipps Conservatory and Botanical Gardens, Pittsburgh, PA
Elaboration_Studios
Joshua Bard & Brian Peters
In collaboration with Edward Fischer, Ryu Kondrup, Ale Meza, Isabella Ouyang, Anthony Ra
Fall 2017

A hoop house is a type of greenhouse that is built using a hooping or bending system, in this case groups used conduit and heat-shrink plastic. The planting arrangement that this hoop house was designed for was a 16’ long planting plot that was partially blocked from the sun by a towering building. Key components that had to be kept in mind were: Will the hoop house allow for plants to be easily maintained and watered? Can the hoop house be assembled and disassembled seasonally? Will the plants be protected from frost and get enough sunlight?

ANGLED PANELS

This design focused on creating a hoop house that reacts to the sunlight by absorbing as much sunlight as it could. To accomplish this, we designed a form that consisted of five panels with differing angles that were based on the sun position at different times of the day. By producing an angle perpendicular to the sun's angle, the hoop house would be able to maximize the sunlight collection through its surface and contain the heat inside. The dynamic, gradually increasing size of the hoop house from front to back was designed to house different types of plants since the botanical garden at Phipps Conservatory has a wide range of plants.

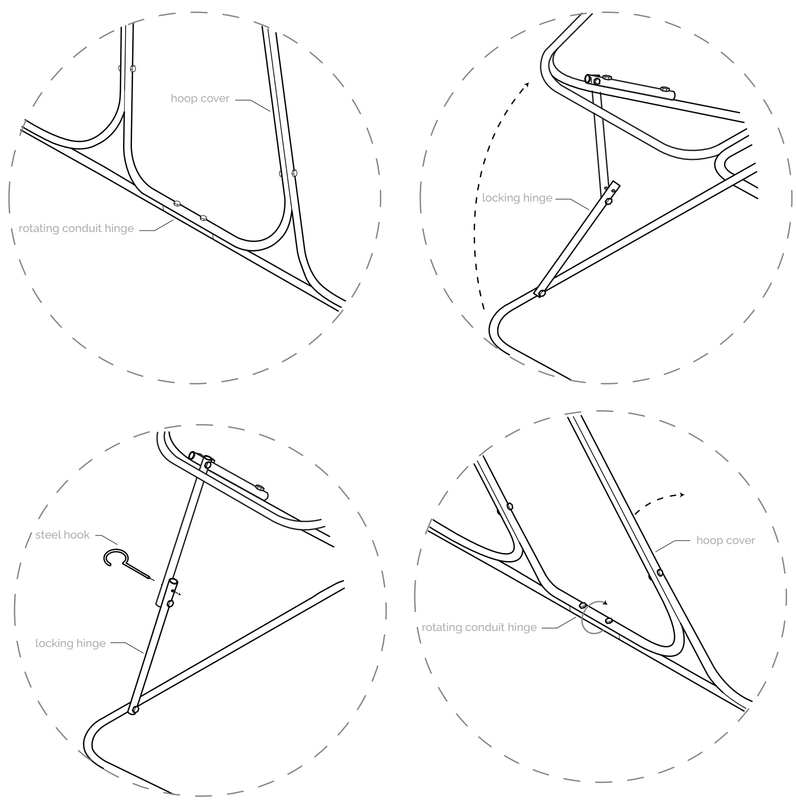




SITE PLAN
TOP LEVEL

The opening mechanism simply lifts upward and uses a rotating hinge and two pins to keep it open. The design allowed for an easy and convenient method for opening the hoop house when tending to the plants and keeping it closed to prevent cold air from coming in. The hoop house was constructed using different lengthed conduit pieces and greenhouse shrink wrap film.

The images below show the joint details that were used in this hoop house system. The top right detail shows the locking hinge sequence and the bottom right photo shows the rotating hinge.



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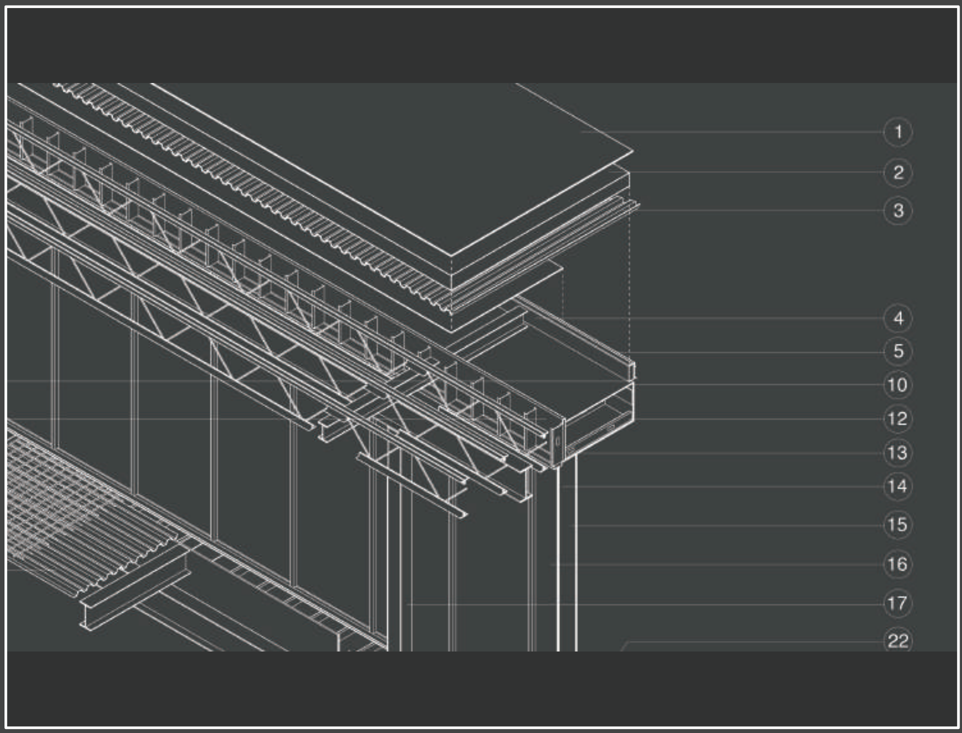
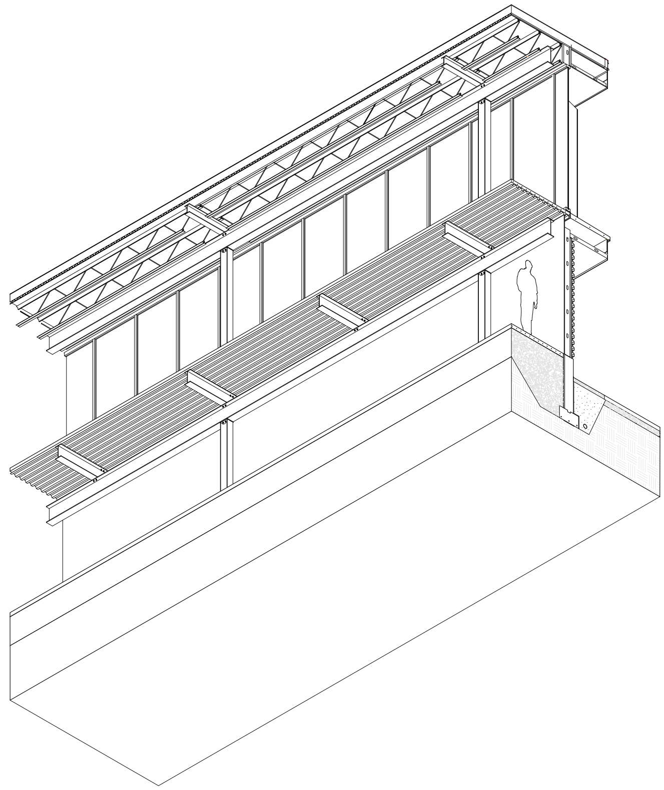
Assembly Sequence



Materials and Assembly Course
Gerard Damiani
Spring 2018

Students were introduced to an assembly sequence to gain an understanding of what parts were necessary to construct a building.



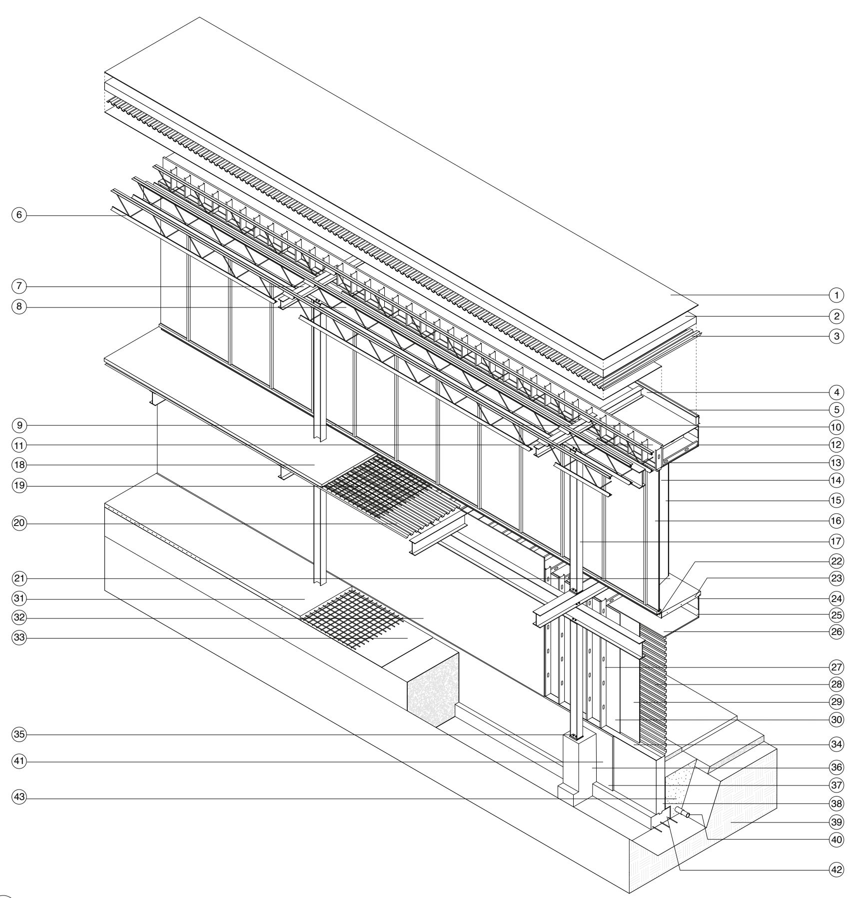
2 ASSEMBLED AXONOMETRIC
1/4" = 0'- 0"

ASSEMBLY SEQUENCE

ASSIGNMENT 1
PAGE: 2 OF 2

48-215 MATERIALS & ASSEMBLY
SPRING 2018
INSTRUCTOR: DAMIANI

COLLEEN DUONG



1 EXPLODED AXONOMETRIC
1/4" = 0'- 0"

CONSTRUCTION MATERIAL KEY:

1. EPDM ROOFING
2. HIGH LOAD RIGID INSULATION
3. STEEL DECKING
4. STAINLESS FLASHING
5. TREATED WOOD BLOCKING
6. STEEL BAR JOIST
7. STEEL SECONDARY BEAMW8X21 @ 24'-0" CENTERS
8. STEEL PRIMARY BEAM @16X45
9. 3/8" TK. STEEL PLATE (WELDEDTO STEEL BEAM)
10. 3/8" TK. STEEL PLATE (WELDED TO STEEL BEAM) FASCIA
11. RIGID INSULATION
12. COLD ROLLED METALFRAMING @ 16" O.C. SPACING(SOFFIT)
13. 1/2" TK. FIBER CEMENT PANEL
14. COLD ROLLED METALFRAMING (BRISE SOLEIL SUBSTRUCTURE)
15. 1/2" TK. FIBER CEMENT PANEL
16. KAWNEER WINDOW 451TSPACED 4'-0" O.C. (VERTICALLY)
17. STEEL COLUMN W8X24 @24'-0" O.C.
18. 20. POLISHED CONCRETESLAB
19. WELDED WIRE MESH
20. STEEL DECKING
21. SLOPED SITE CAST SILL
22. 1" RIGID INSULATION(THERMAL ISOLATION)
23. #6 REINFORCING BAR 16" O.C. EACH WAY
24. 3/8" STEEL PLATE WELDED TOFLANGE AND WEB.
25. 3/8" TK. STEEL PLATE (WELDEDTO STEEL BEAM) FASCIA
26. 1/2" TK. FIBER CEMENT PANEL
27. COLD ROLLED METALFRAMING @ 16" O.C. SPACING
28. CORRUGATED METAL SIDING
29. VAPOR BARRIER
30. RIGID INSULATION
31. 5/8" TYPE X GYPSUM BOARD
32. CONCRETE SLAB W/ WELDEDWIRE MESH
33. VAPOR BARRIER
34. SILL SEAL
35. 1/2" DIA. ANCHOR BOLTS WITH NON SHRINK GROUT BED
36. 18" WIDE CONCRETE PIER
37. RIGID INSULATION
38. 10" TK. CAST IN PLACE CONCRETE FOUNDATION WALL
39. GRAVEL BACKFILL
40. FOUNDATION DRAIN W/ GEO TEXTILE FABRIC
41. WATERPROOFING
42. REINFORCED CONCRETE FOOTING (W/ (3) #6 REINFORCINGBAR
43. COMPACTED GRAVEL FILL

ASSEMBLY SEQUENCE

ASSIGNMENT 1
PAGE: 1 OF 2

48-215 MATERIALS & ASSEMBLY
SPRING 2018
INSTRUCTOR: DAMIANI

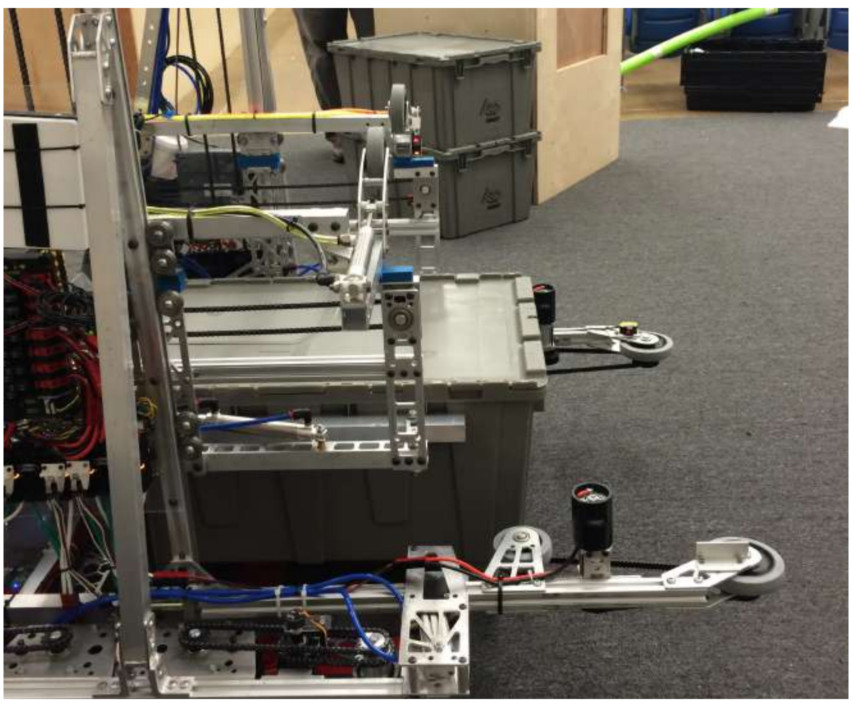
COLLEEN DUONG

FIRST Robotics
Recycle Rush

Team Kika Mana #368
Positions: *Captain and Coach*
Awards: *1st Place at Hawaii Regionals*
Finalist at San Jose Regionals
World Championship Carver Division Winners
Spring 2015

Recycle Rush was the 2015 FIRST Robotics Competition. The objective of the game was to design a robot that could pick up and stack totes on scoring platforms and putting the recycling containers on top of the scoring stack of totes. Along with these objectives, robots had a 15-second period where robots must act on their own according to instructions from programming. There were two scoring options for teams to program for: picking up the three yellow totes and scoring them or grabbing the recycling bins in the middle of the field to maximize scoring.

In architecture and robotics we are encouraged to use our imagination to create something that we've never seen before that tests our creative abilities to their limits. In FIRST Robotics teams are given a manuel with base requirements and a competition brief that we have to use to design and build a robot within 6-weeks. Throughout the competition season we are encouraged to build, test, and iterate as we go through various competitions all over the world.



RECYCLE RUSH

The robot was designed to be able to intake both recycling bins and totes to the maximum height (6 totes + 1 recycling bin). The robot has an elevator system that moves the intook item upward allowing for space for the next item to be intook. The drive was a four-wheel swerve drive to allow for more controlled movement through the game field.

The game rules restricted the robot from going over a certain size, which was a height that was shorter than the height of the maximum stack of items that could be scored. To prevent the recycling bin at the top of the tote stack from falling over, the elevator system had two wheels on both sides of it to hold the recycling bin in place.

Thank you

Please feel free to contact me if you have any questions.
Visit colleenduong.com for more works.