COLLEEN DUONG

808 429 6239 // duong.colleen@gmail.com

colleenduong.com

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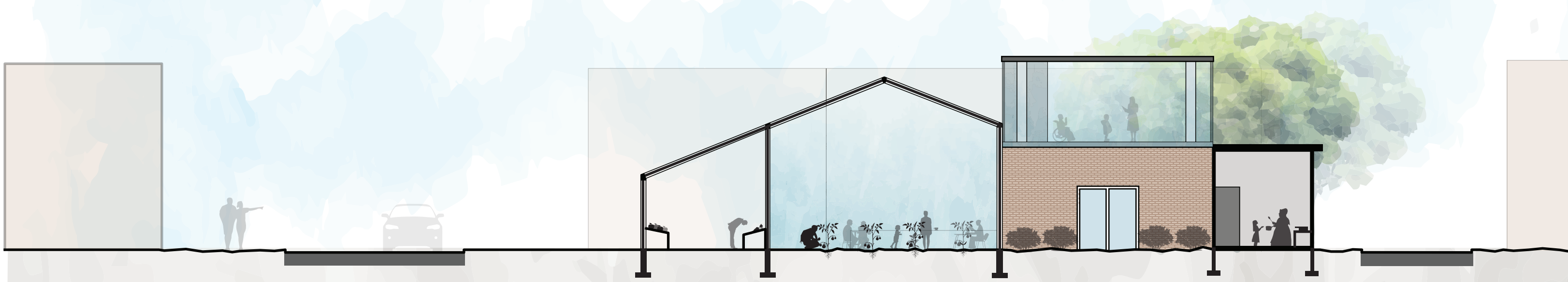
URBAN AGRICULTURE CENTER
SANKOFA

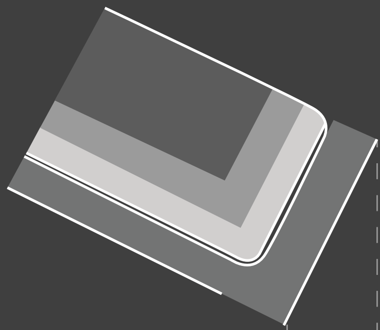
YEAR Fall 2017
LOCATION Sankofa Community Gardens in Homewood, PA
PROJECT Design Proposal



Each student developed a building proposal for a new center for Urban Agriculture in Pittsburgh. The site was speci cally Sankofa Community Garden located in Homewood. The center will serve as a hub supporting urban gardening and farming activity in Pittsburgh. The center will also become an outreach center allowing for education and community engagement from the citizens of Homewood.

Sankofa Community Garden is located at 7539 Susquehanna Street in the Homewood community. The term Sankofa is defined as a lifestyle and trying to the best that we, the people, have to offer and bring it forward. The site originally had one, two-story building on the site.

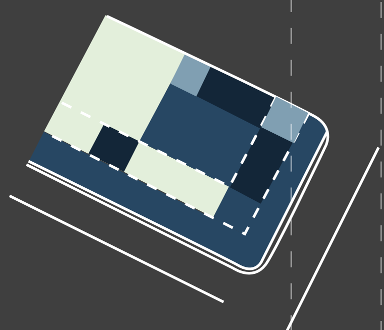
The driving idea for this project focused on circulation around the site and also on the different levels and areas of education in the program.



- Private
- Semi Private
- Public
- Sidewalk / Road

1 CIRCULATION

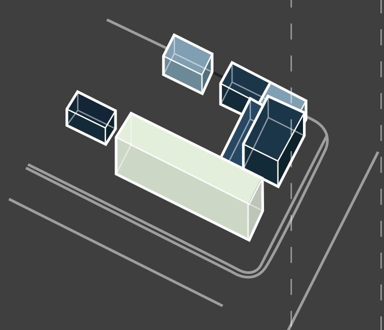
There are two main roads surrounding the site that helped drive the organizational aspect of this project.



- Social and Grow
- Public Social
- Private Social
- Logistics (Storage, Loading Area, etc).

2 PROGRAM & MASSING

Using the diagram above, organized more specific spaces and created buildings using those spaces.

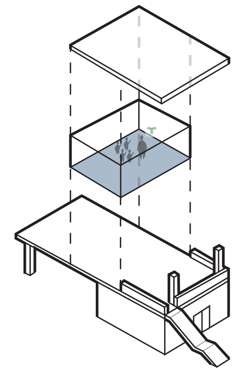


- Greenspace
- Money Producing (Farmer's Market + Cafe)
- Other Space

3 VISITORS vs. RESIDENTS

Separated building type dependent on the type of people passing through each of the main circulation paths.

- VISITORS
- RESIDENTS
- PEDESTRIANS



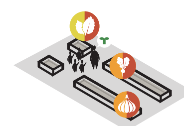
EDUCATION

LEVEL 1: CLASSROOM

Elevated classroom to allow for students to look at the entire site from above for learning reference.

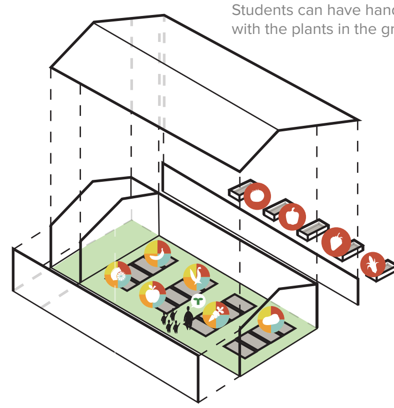
LEVEL 2: COURTYARD

Small courtyard growing space with seating areas. An intersection point to go from the classroom to the greenhouse or outdoor growing space.



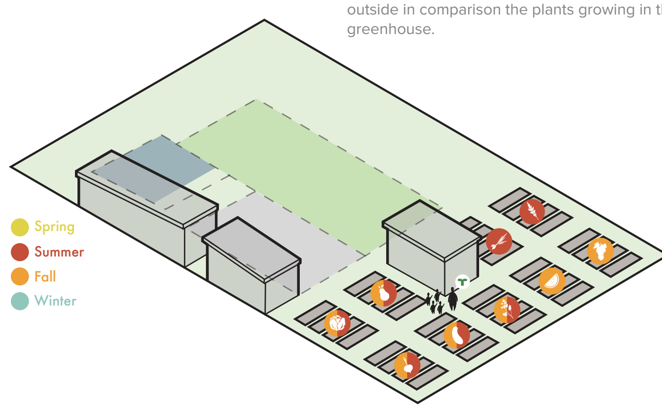
LEVEL 3: GREENHOUSE

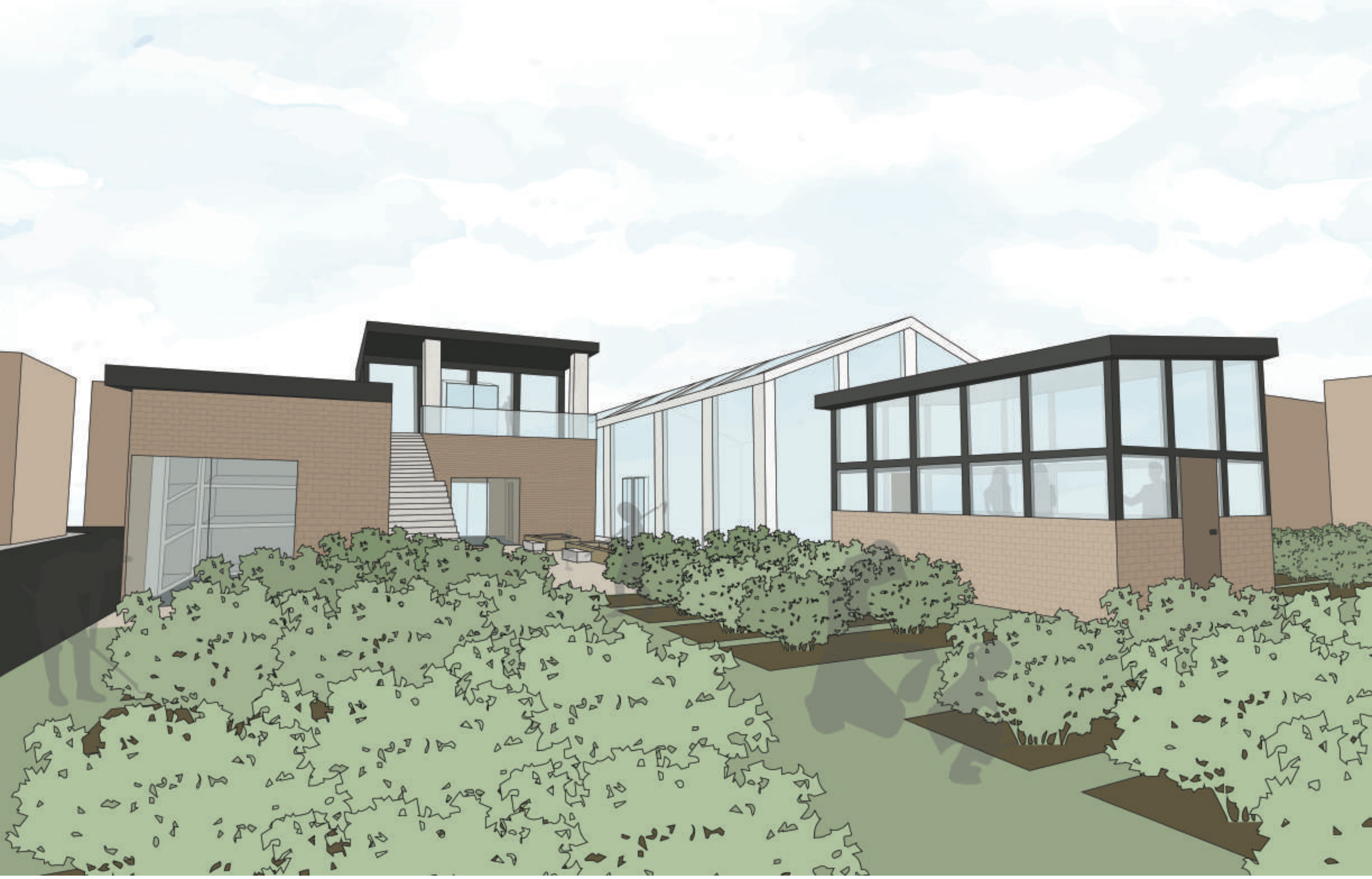
Students can have hands-on learning experience with the plants in the greenhouse.



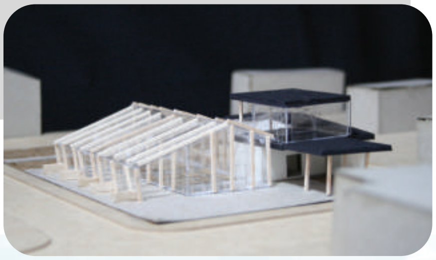
LEVEL 4: TRADITIONAL GARDENING

Students can have hands-on learning experience with the plants in the outdoor growing space. Can learn about the different types of plants growing outside in comparison the plants growing in the greenhouse.





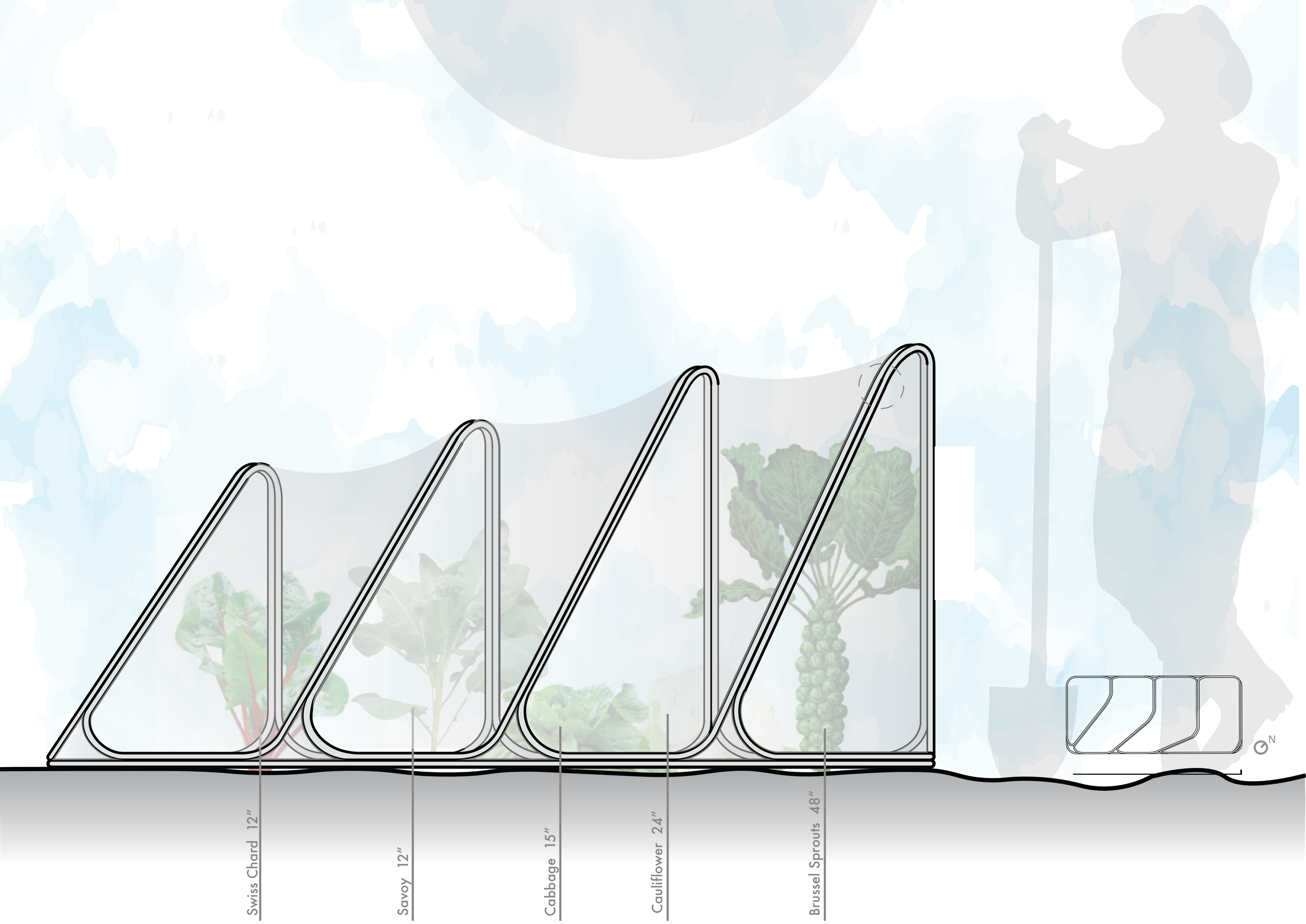
The original building on site was made of bricks and to try and preserve a sense of the history of the old building I used the existing material in my proposal along with glass for the greenhouse and classroom. I wanted to have a gradual change in material (bottom is brick, top is glass), which I tried to have with the large windows in the rooms on the first floor. Another aspect that I focused on was the cost of the project, because the client wanted this to be a cost efficient design, so I wanted to create a more simpler design that would be easy to construct; similar to a Do-It-Yourself project.



HOOP HOUSE

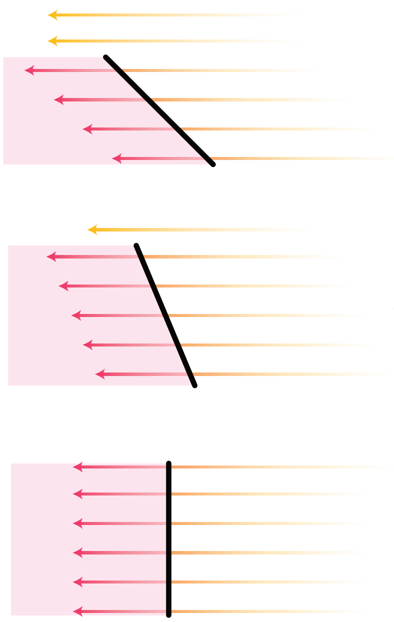
JUST 'DUIT

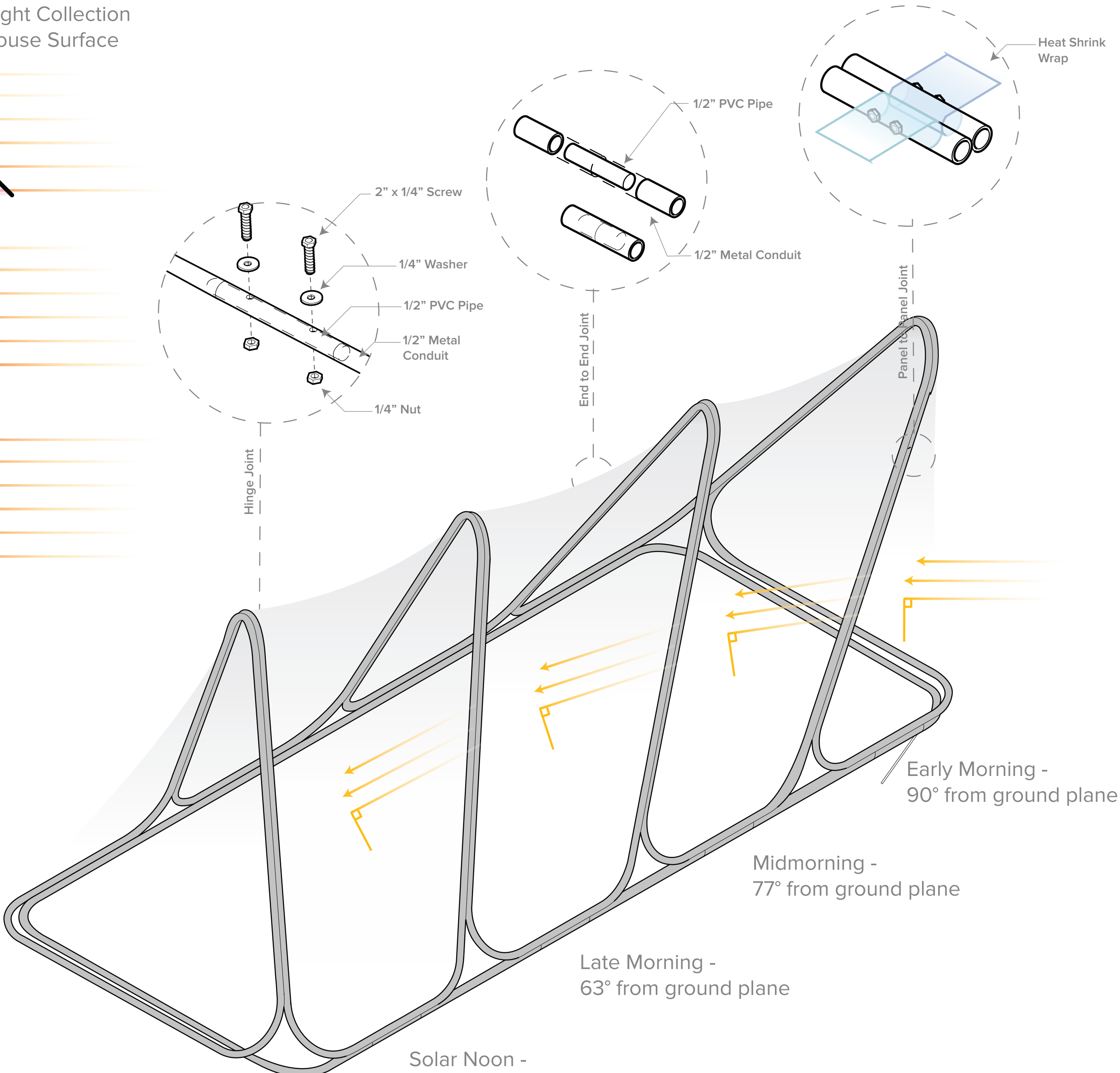
YEAR Fall 2017
LOCATION Phipps Conservatory and Botanical Gardens
PROJECT Built and Installed at Consevatory
GROUP MEMBERS Edward Fischer, Ryu Kondrup, Ale Meza
Isabella Ouyang, Anthony Ra

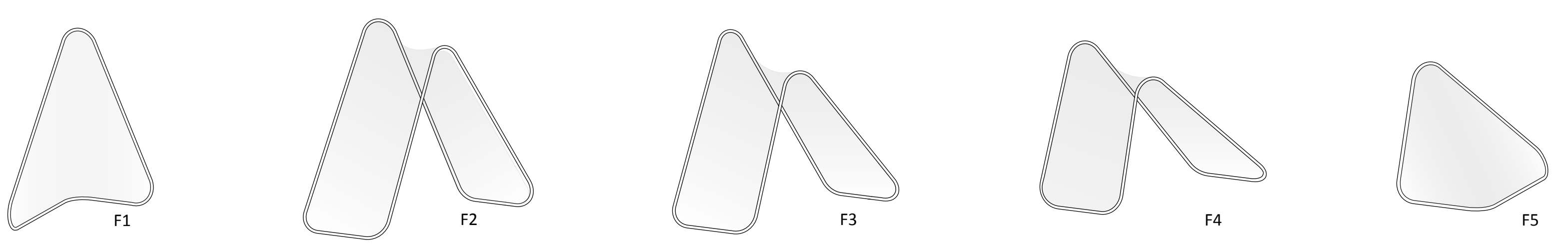


The angles of each panel was based on specific angles that were calculated on the sun position on different times of the day and by producing an angle perpendicular to the sun to maximize the sunlight collection through the hoop house surface. The dynamic, gradually increasing size of the hoop house from front to back was designed to house different types of plants since the botanical garden at Phipps had a wide range of plants from all different heights.

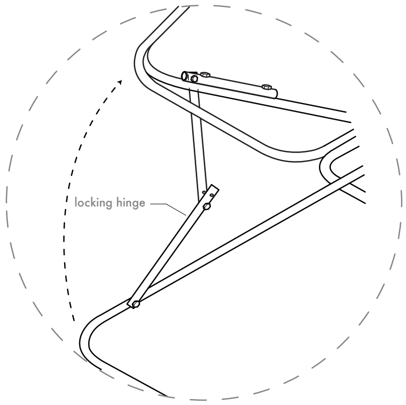
Maximizing Sunlight Collection through Hoop House Surface





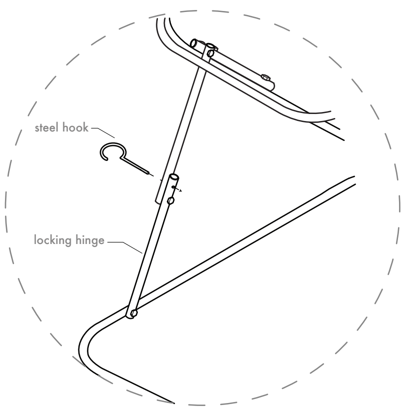


The opening mechanism simply lifts upward and uses a rotating hinge and two pins to keep it open. There were several opening mechanisms that were originally attempted until finally reaching this final mechanism: having two panels open upward, a rail system, an arm mechanism. However, all attempts had their own issues that prevented them from working, so we struggled with trying to figure out a working opening mechanism that would keep the cold air out of the hoop house, and we were able to finally come up with this mechanism that successfully worked.

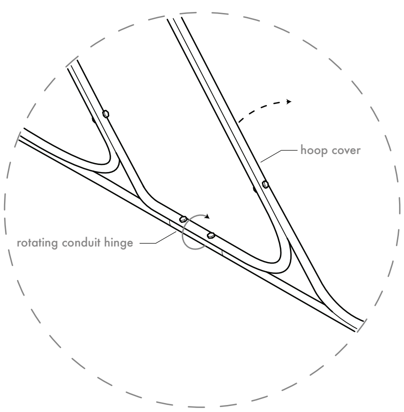


Locking Hinge Sequence

Front View

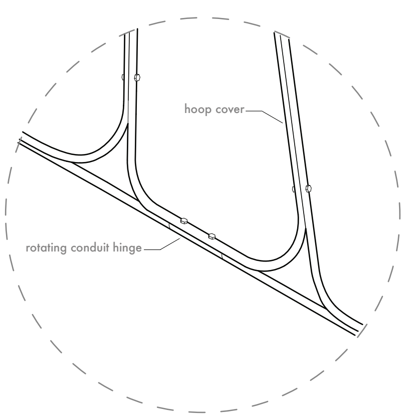


Open Front View



Rotating Hinge Detail

Opening Hinge Detail



Side Elevation

FOLDED GARDEN

PARSLEY

YEAR Fall 2017
LOCATION Phipps Conservatory and Botanical Gardens
PROJECT Built and Installed at Consevatory

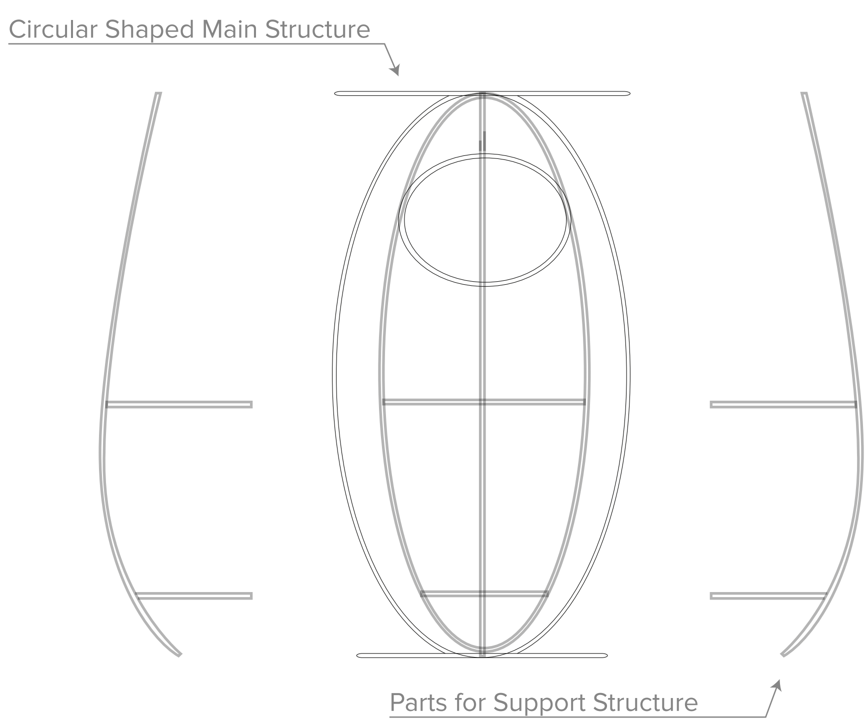
Front Elevation

Folded Garden is a project focused on constructing a growing armature to sustain a plant through the season's first frost. Students were given the opportunity to explore different shapes and plant properties that they wanted to take into account when constructing an armature for their given plant. The materials that were given included 0.062" or 0.032" thick wire and heat shrink wrap. The design aimed to create an armature that focused on certain issues that were faced while taking care of the plant during the week. These problems consisted of its vase-like shape and the amount of times the plant had to be maintained. Considering these factors, the design aimed to create an armature that was tall to support the height of the plant and have an open area to give a person easy access to the plant's stems, leaves, and roots. The shape of the planter was designed to provide the plant with enough space to freely grow without being too tight.

Side Elevation

Top Elevation

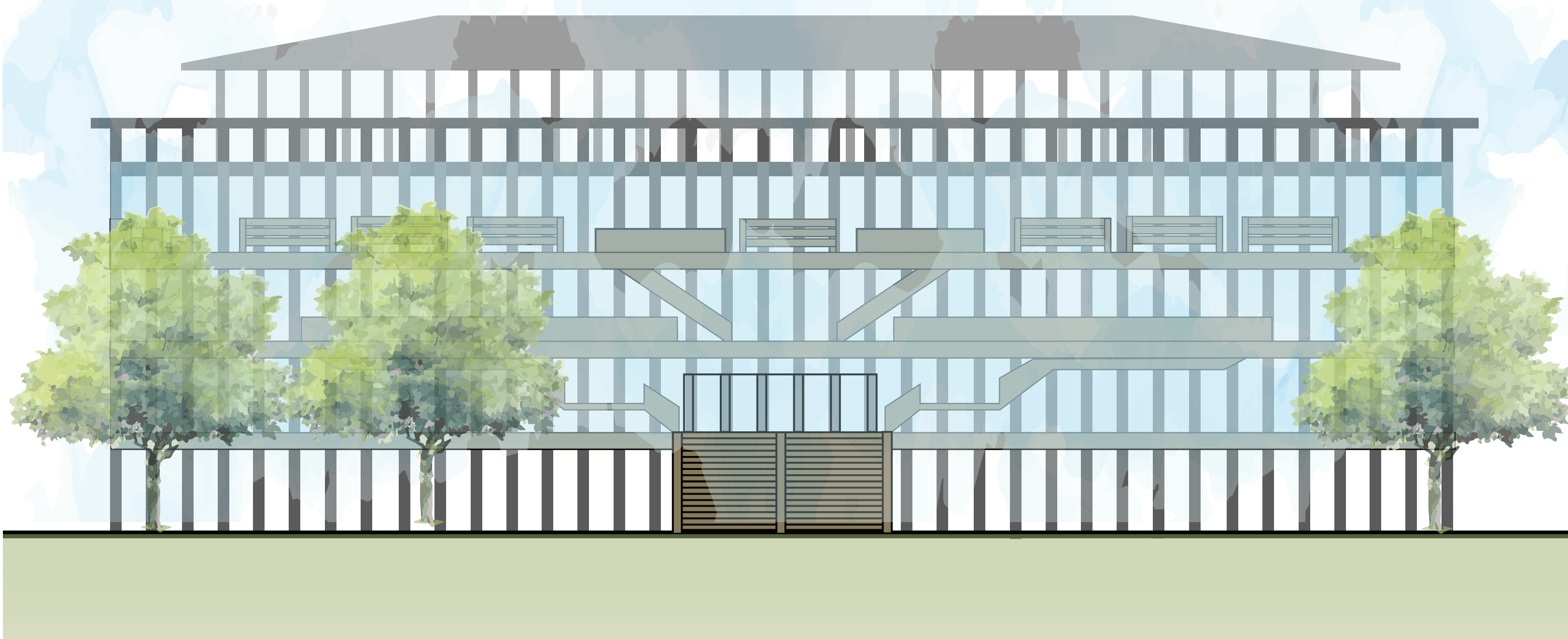
The opening in the armature for easy access to the roots of the plant, designed for tending to the plant.

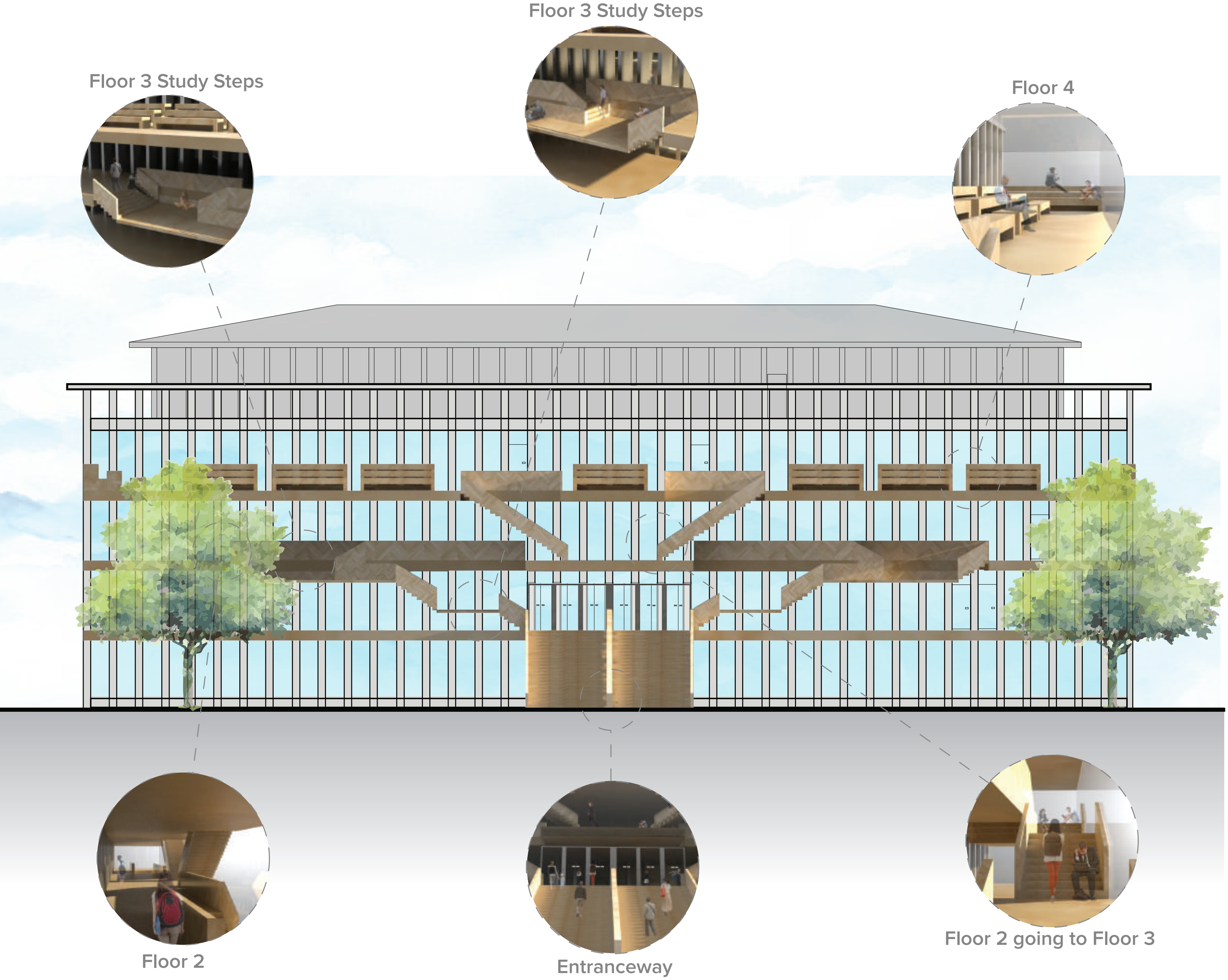


PARASITE

HUNT LIBRARY

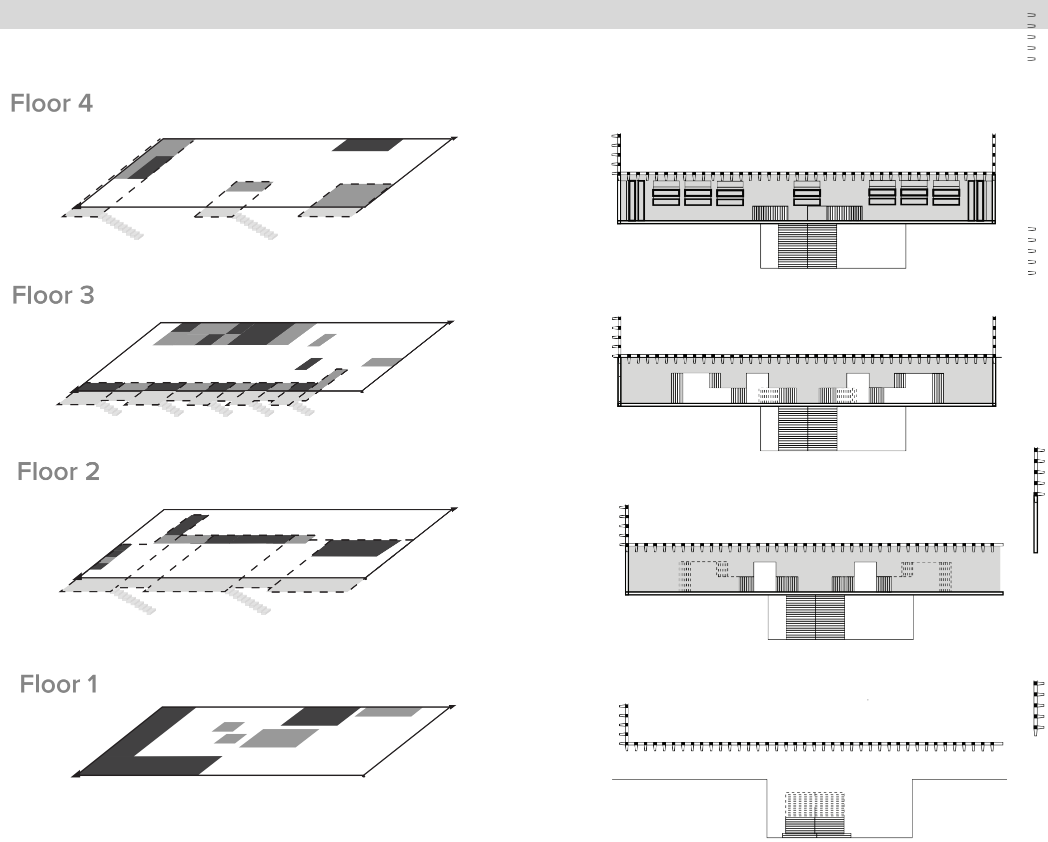
YEAR Spring 2017
LOCATION Hunt Library at Carnegie Mellon University
PROJECT Design Proposal





The design proposal aimed to try and add more study spaces to an existing building, Hunt Library, which is located on Carnegie Mellon University's campus. My design proposal focused on the idea of allowing people outside to be able to have a sense of what was happening inside through an "ant-farm" system. All of the stairs allowed for constant circulation while also providing different types of study spaces for visitors. Each floor has a different program, whether its individual study spaces, group study spaces, or a little bit of both. Circulation increases with all of the stairs that are added improving student conveniency no matter which building they are coming from because of the grand entrance at the very center of Hunt Library.

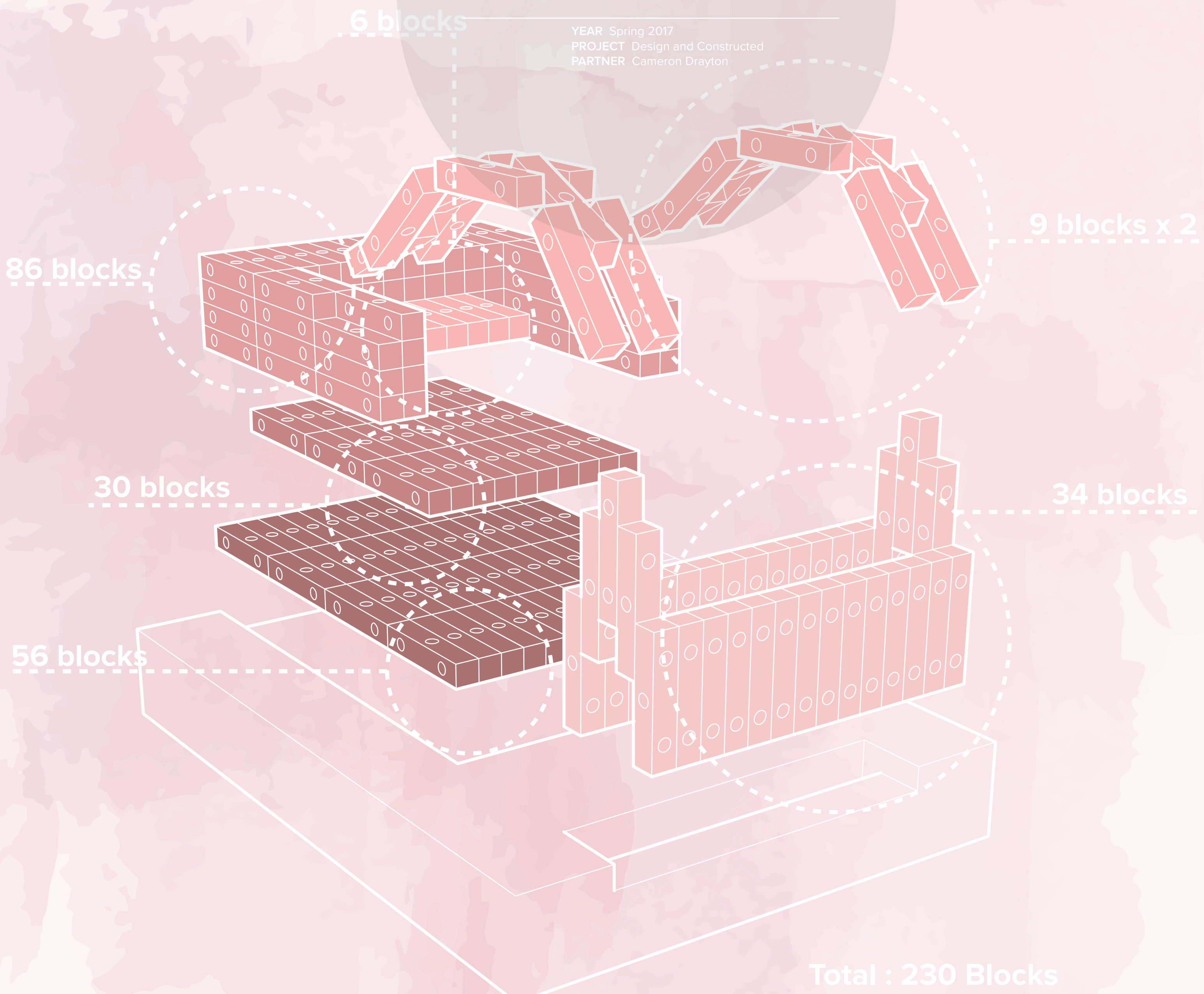
The different study spaces in hunt are used at different times throughout the day, but the most crucial time is the afternoon when students are out and about, going to and from classes. Using that diagram, spaces outside of the library were extruded from those spaces being used and were used to create the shape of each floor in the Hunt Library parasite. This data also helped create the different types of stairs on each floor and how many stairs to include on that floor; the more frequently used floors had more stairs and study spaces while the floors used less frequently had less study spaces.



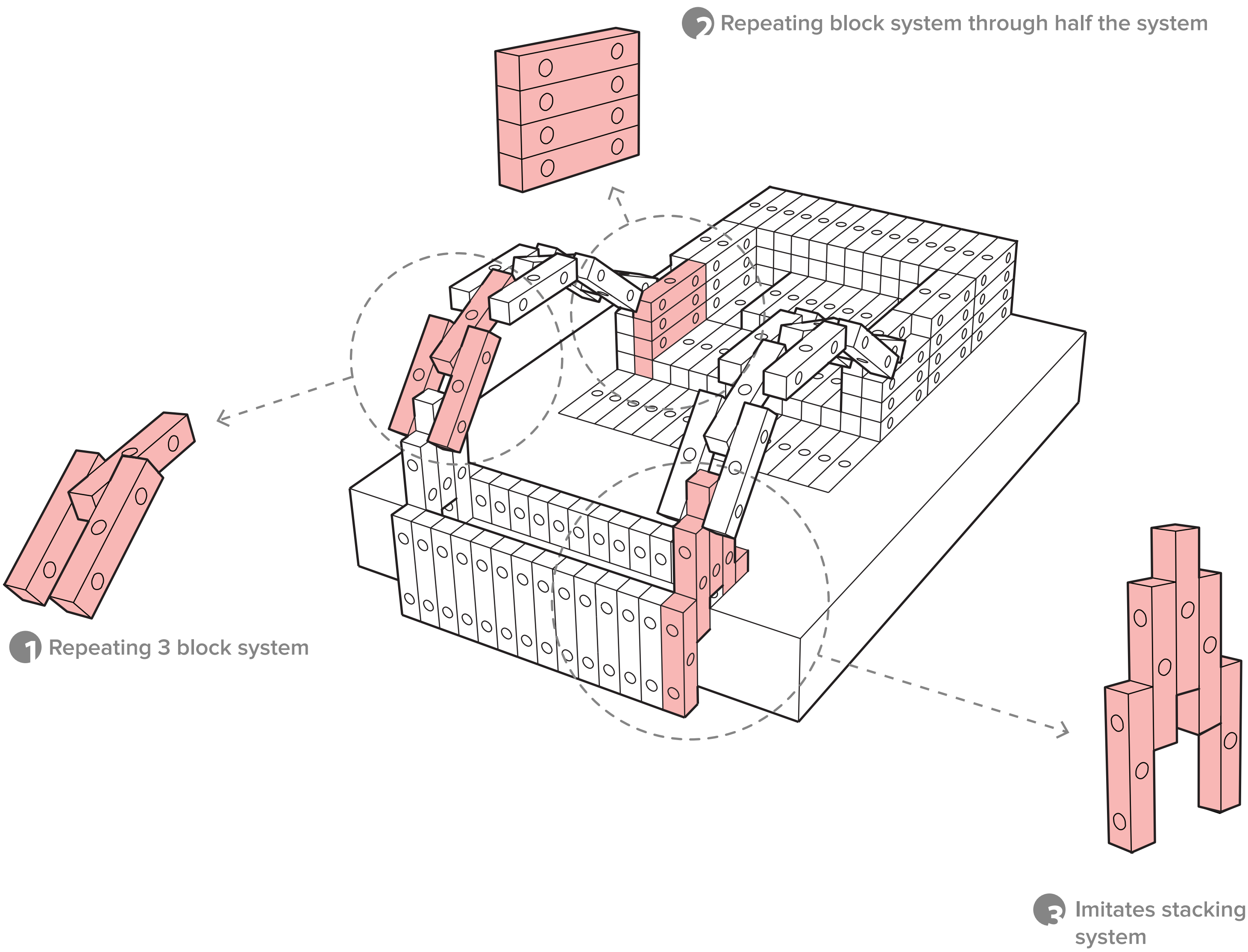
MOTION MODEL

FROSTER

YEAR Spring 2017
PROJECT Design and Constructed
PARTNER Cameron Drayton

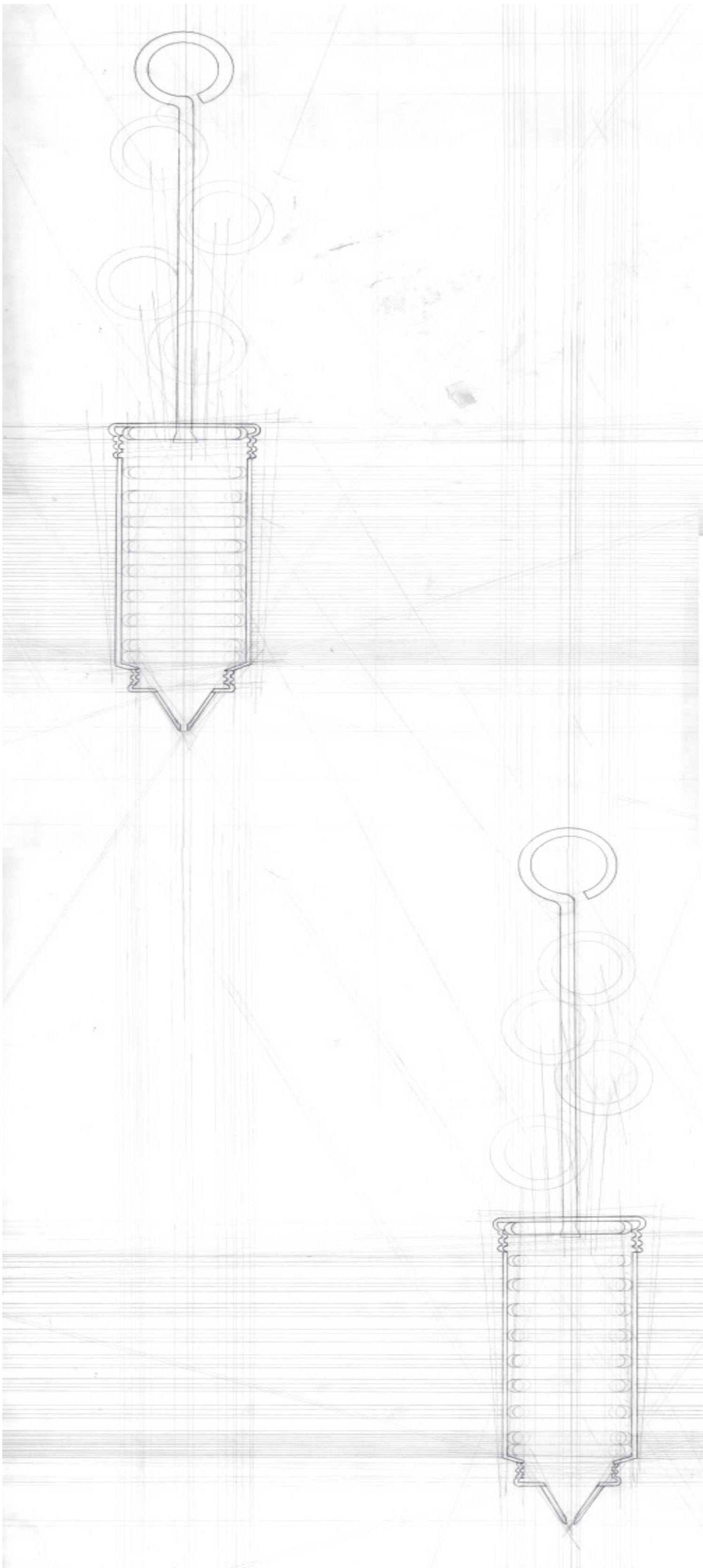


Each student was given a different kitchen tool. I was given a froster. After studying the shape of the tool and studying how it moves, students were paired up to try and create a motion model that represented both of their kitchen tools. My partner's tool was a potato cutter. The concept of our model was to make the entire model using the exact same piece repetitively over 200 times. The verbs we were trying to aim for in our model were: layering, splitting, time, and bending. There are two sides to the model to represent the two different kitchen tools, the left represents the froster and the right, more rectangular part, represents the potato cutter being bridged together with the same sized piece.

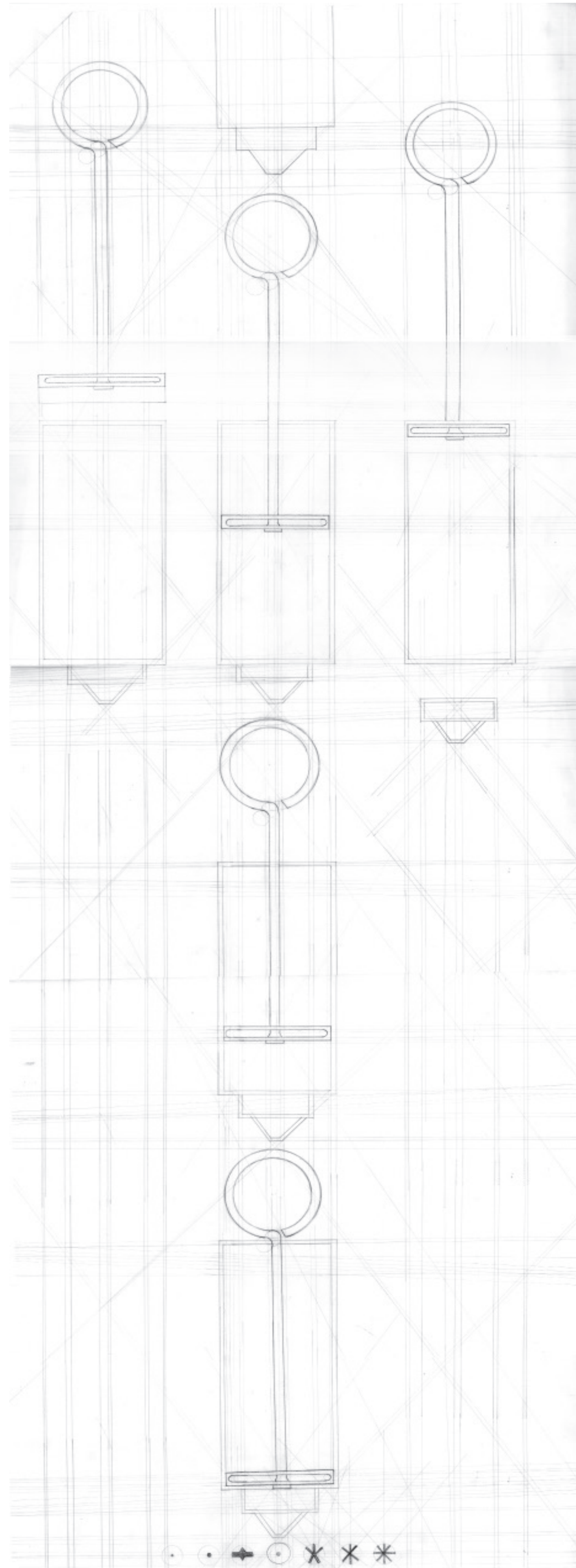


The different parts of the model are clearly shown above. There is a clear separation in the shape of the pieces being used on the varying sides of the model. Number 1 represents the froster and number 2 represents the potato cutter while number 3 represents the connection, or bridge, between the two sides.

Initial studies of the object and how it moves.



Froster Motion Drawing



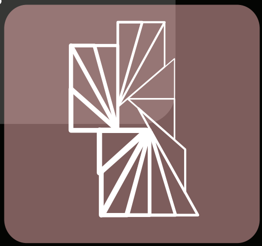
Froster Object Drawing

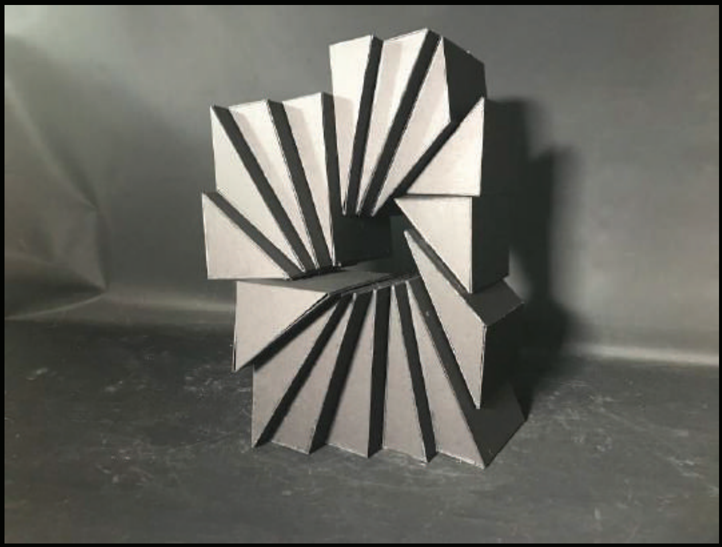
MAKING COMPUTATIONALLY PIERCE

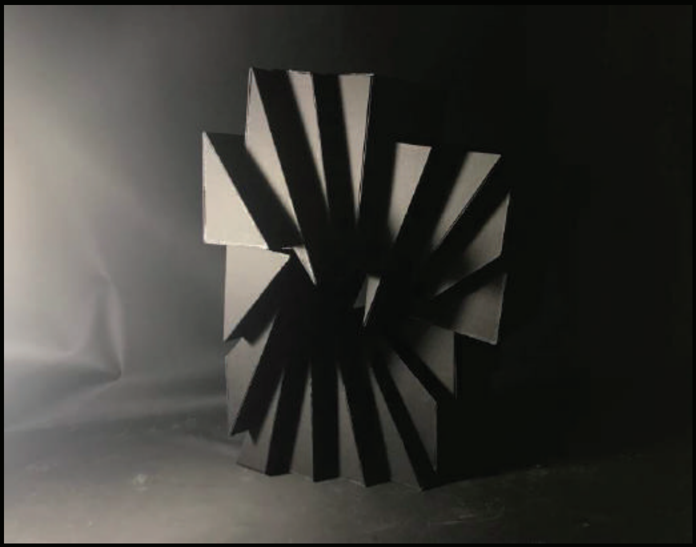
YEAR Spring 2018
PROJECT Design and Constructed
PARTNERS Fallon Creech & Vincent Derienzo

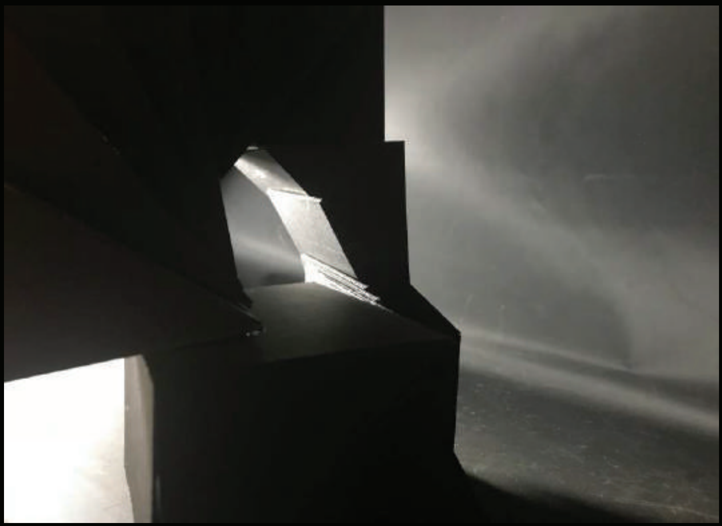
This was a 2-week project exploring the production of form and design through the definition and application of rules. It describe a rule-based system for designing and making using shape grammars. Shape grammars define the structure of a design space by establishing a vocabulary of elements and series of rules that can be applied open-endedly.

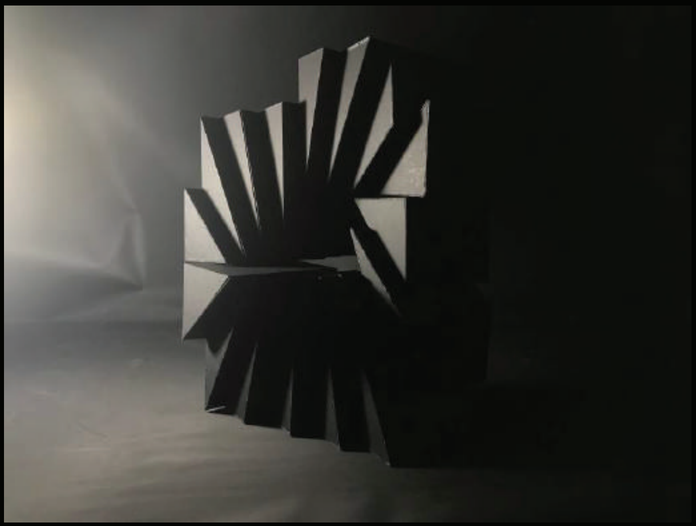
This projec takes into account the methodical grammar of slice, slide, and pull. In cutting the block into cross-sectional piecesand creating an oscillating motion from that cut method, the modules are then pulled outwards in slight quadrant formations. The object maintains a strong sense of space through the void in the center and the way that the form extrudes outwards displays the obedience to the grammar in a systematic reaction. The consistency of the cuts in breaking the block adds to the programmatic reassignment of the form. Our process involved oscillation through translating from the beginning, but how this final model differs is in the way that the pull motion redefines the space and the form when considered in plan and elevation. In pulling forms out, the recollection of modules creates a new grouping method that re-formats the tradition shape of the blocks and re-orients the form assessment. In the initial move of breaking the volume of the block with consistent, cross-sectional cuts, the pulling motion breaks the created volume yet again and orients the form in a new light.











Rules

1. Slice

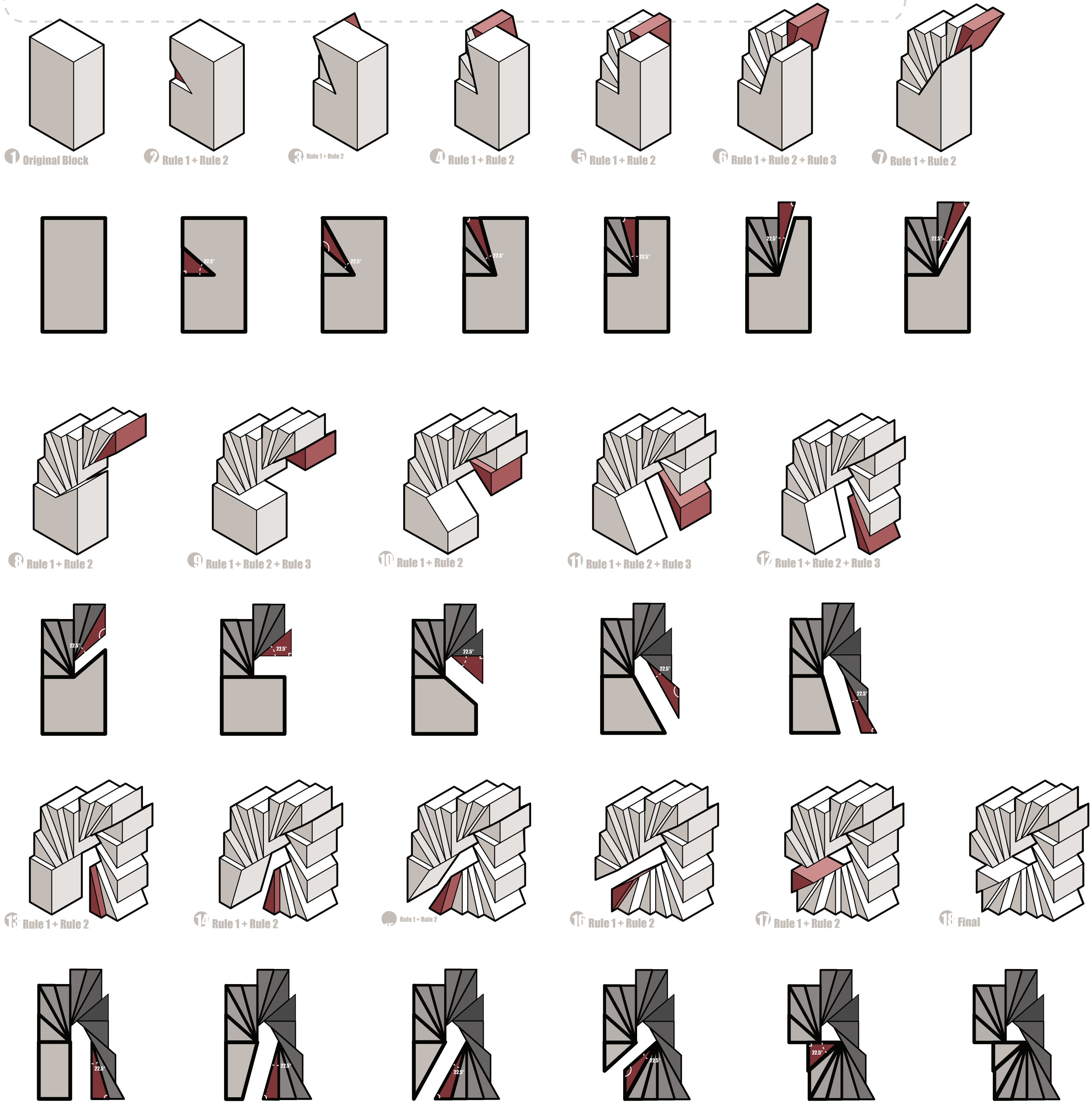
Cut out a triangle from a 22.5 degree angle from the center of the rectangular block.

2. Slide

Slide the triangular piece forward or backward by 1 inch.

3. Pull

Pull triangular piece away from the center of the original rectangular prism.



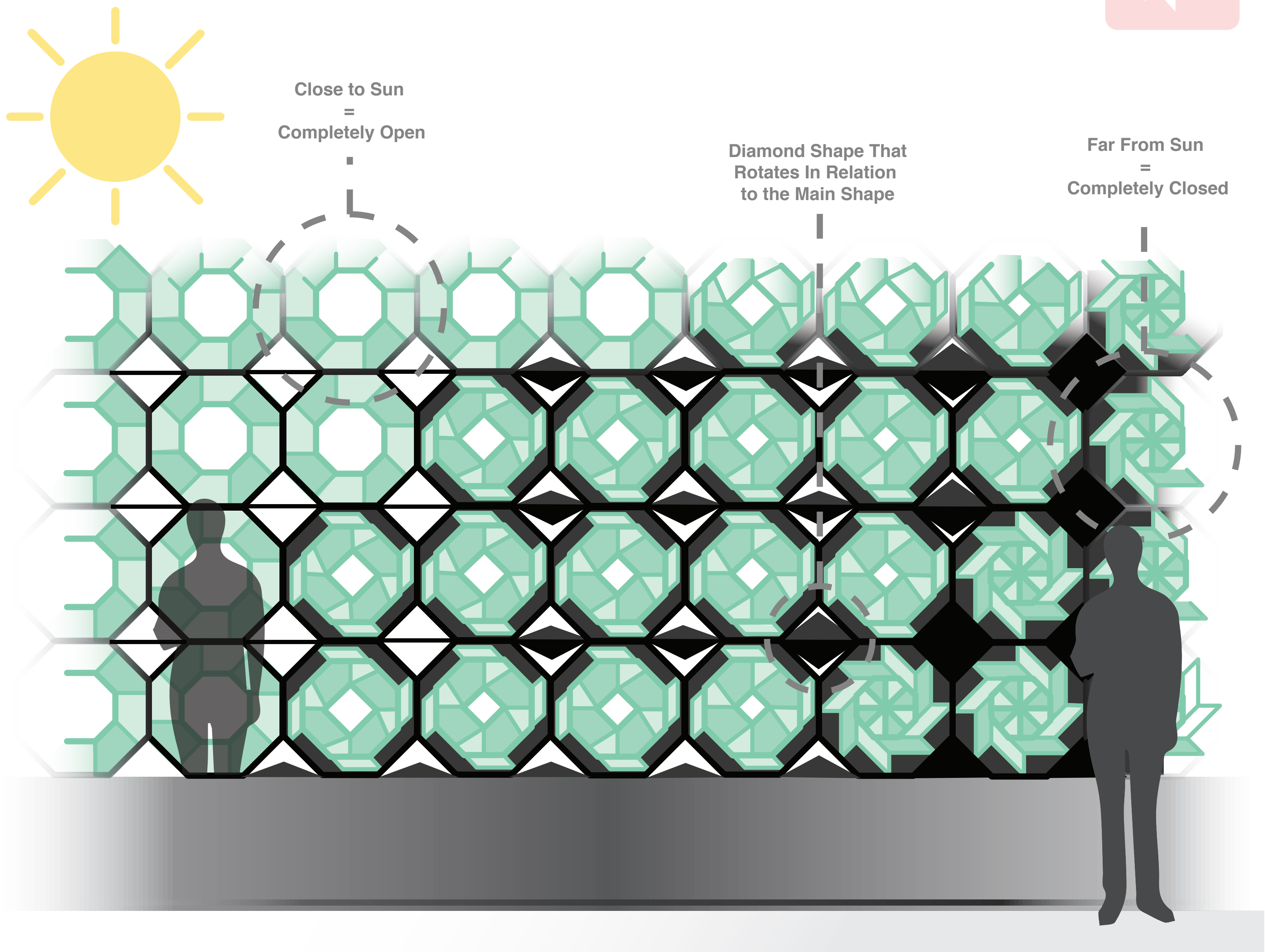
KINETIC ARCHITECTURAL SYSTEM

FOLDED BLOOM

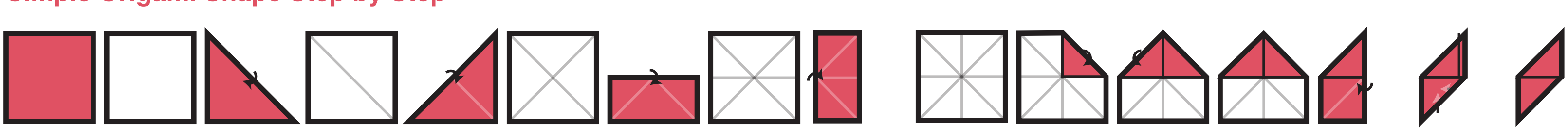
YEAR Spring 2018
PROJECT Design and Constructed
PARTNER Gisselt Gomez

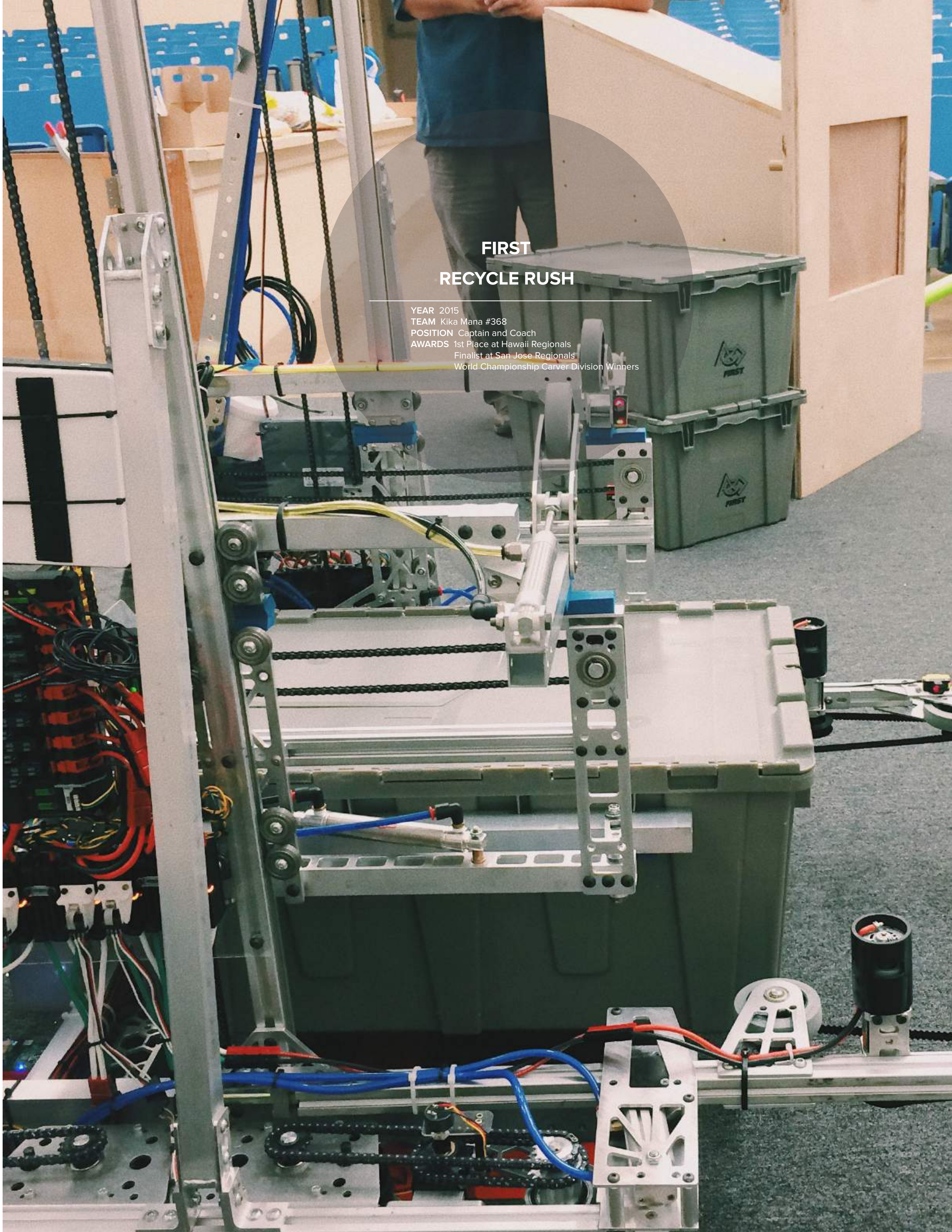
This was a 2-week project that explored the design of a kinetic and responsive architectural system. The goal was to generate a responsive design concept and develop it through both manual methods and digital prototyping while focusing on the plasticity and quality of motion, considering how the kinetic and responsive architectural system works in relation to external forces.

This project explores the parts to whole framework in a filtration system. The design processes began by exploring different origami forms using a 4” by 4“ square folded into a polygon as a princial element. This system interlocked each piece to create a subsystem of hexagonal rings which are then arrayed to create a filtration system. The hexagonal rings are designed such that the degree of exposure can be adjusted on each individual ring. Modifications at an individual scale allow for a more flexible and responsive filtration system. In between each hexagonal ring is a rotating diamond shape that also acts as a secondary filtration system and a connection for the main filtration system. The differing colors of the pieces represent varying degrees of transparency: Black is non-transparent, dark green is semi-transparent, and white is fully transparent.



Simple Origami Shape Step by Step





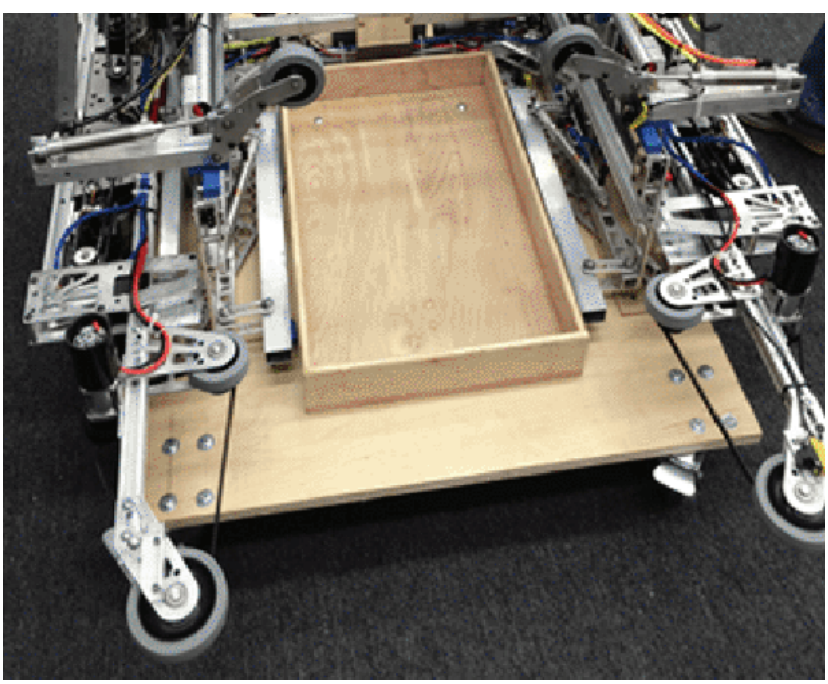
FIRST

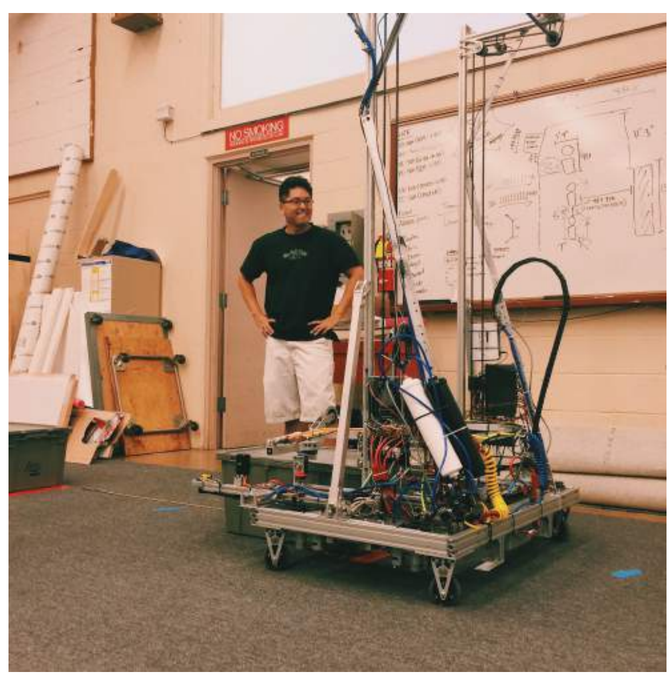
RECYCLE RUSH

YEAR 2015
TEAM Kika Mana #368
POSITION Captain and Coach
AWARDS 1st Place at Hawaii Regionals
Finalist at San Jose Regionals
World Championship Carver Division Winners

Objective: Picking up and stacking totes on scoring platforms and putting pool noodles ("litter") inside of the recycling containers and putting the containers at the top of the scoring stacks of totes.

Robot: The robot was designed to be able to intake both recycling bins (laying down) and totes to the maximum height (6 totes + 1 recycling bin). The robot was designed to have an elevator to allow for whatever is intaked to go up one level to allow for the next item to be intaked. An additional aspect that was added to the elevator system are two wheels on each side of the elevator that are used to help hold the recycling bin in place and prevent it from falling off the high stack of totes. This robot also had can grabbers (x2) that were installed to allow for the robot to grab the recycling bins that are placed in the center of the field





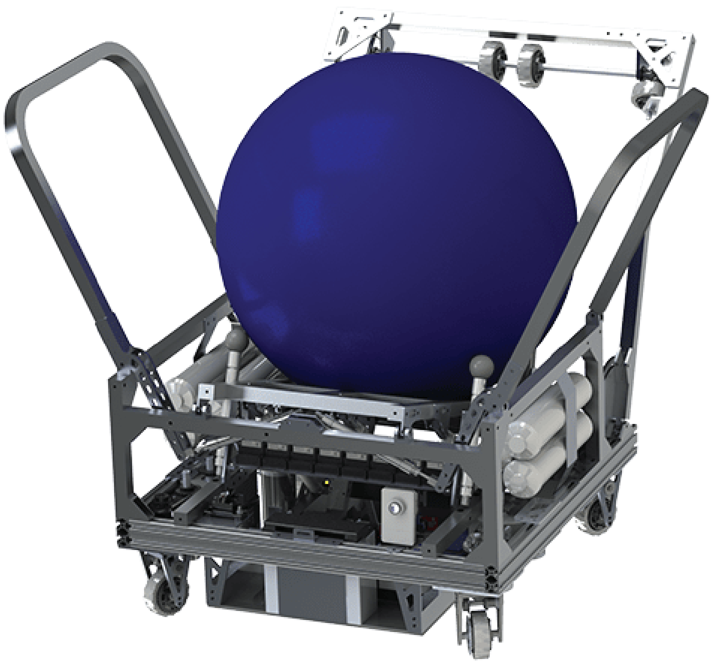
FIRST

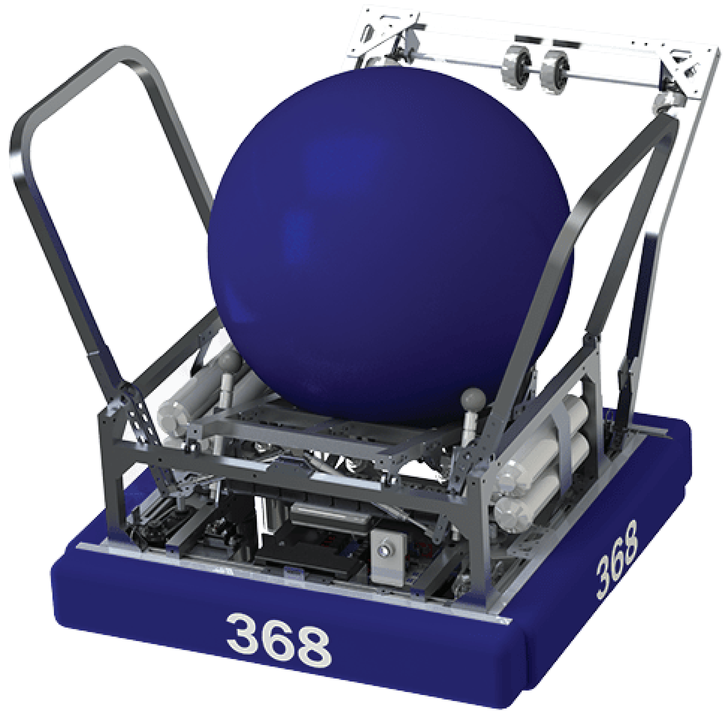
AERIAL ASSIST

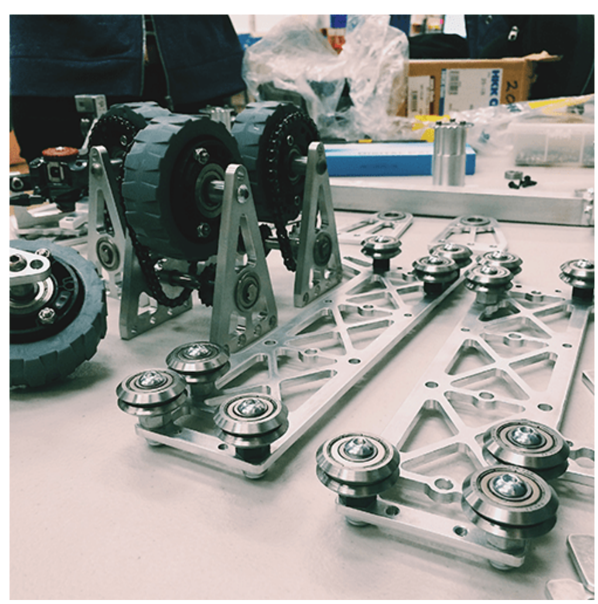
YEAR 2014
TEAM Kika Mana #368
AWARDS 1st Place at Hawaii Regionals
Innovation in Control Award

Objective: Scoring 2'-diameter exercise balls into scoring areas located at far ends of the field. Additional points can be scored by passing the ball amongst the alliance robots in-between zones and by throwing the ball over the truss (midpoint overhang)

Robot: This robot has a swerve drive to allow easy maneuvering across the field and to easily avoid opponent robots. The robot also has wings that can open and close to allow us to easily catch the ball (open) and to make sure the ball does not fall out (closed). The intake of the robot is designed to propel downward (to pickup the ball) and to propel upward (to keep within the size requirements of the robot). The intake is also designed to allow the ball to be picked up easily from multi-directions (left, right, straight-front)

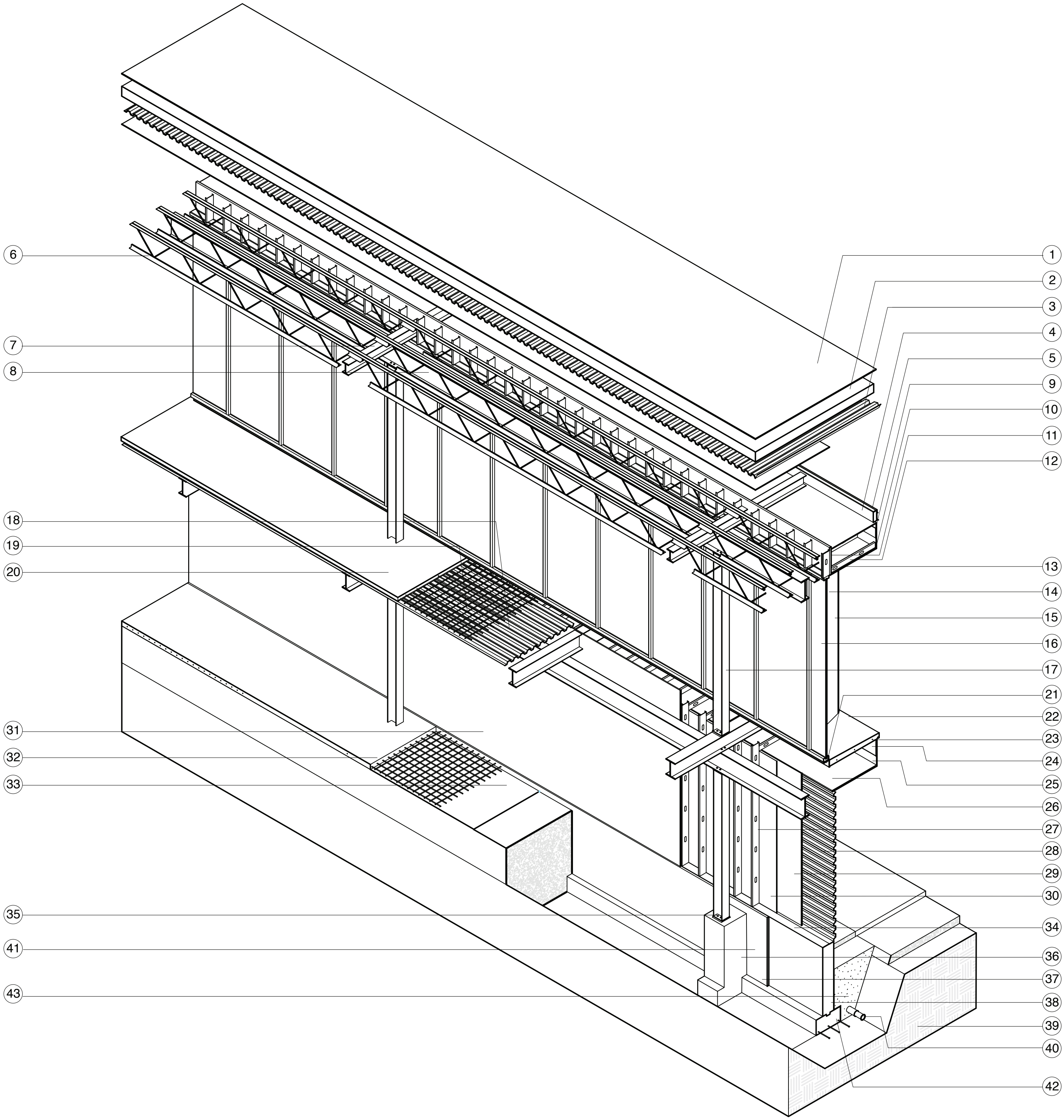






MATERIALS & ASSEMBLY DRAWINGS

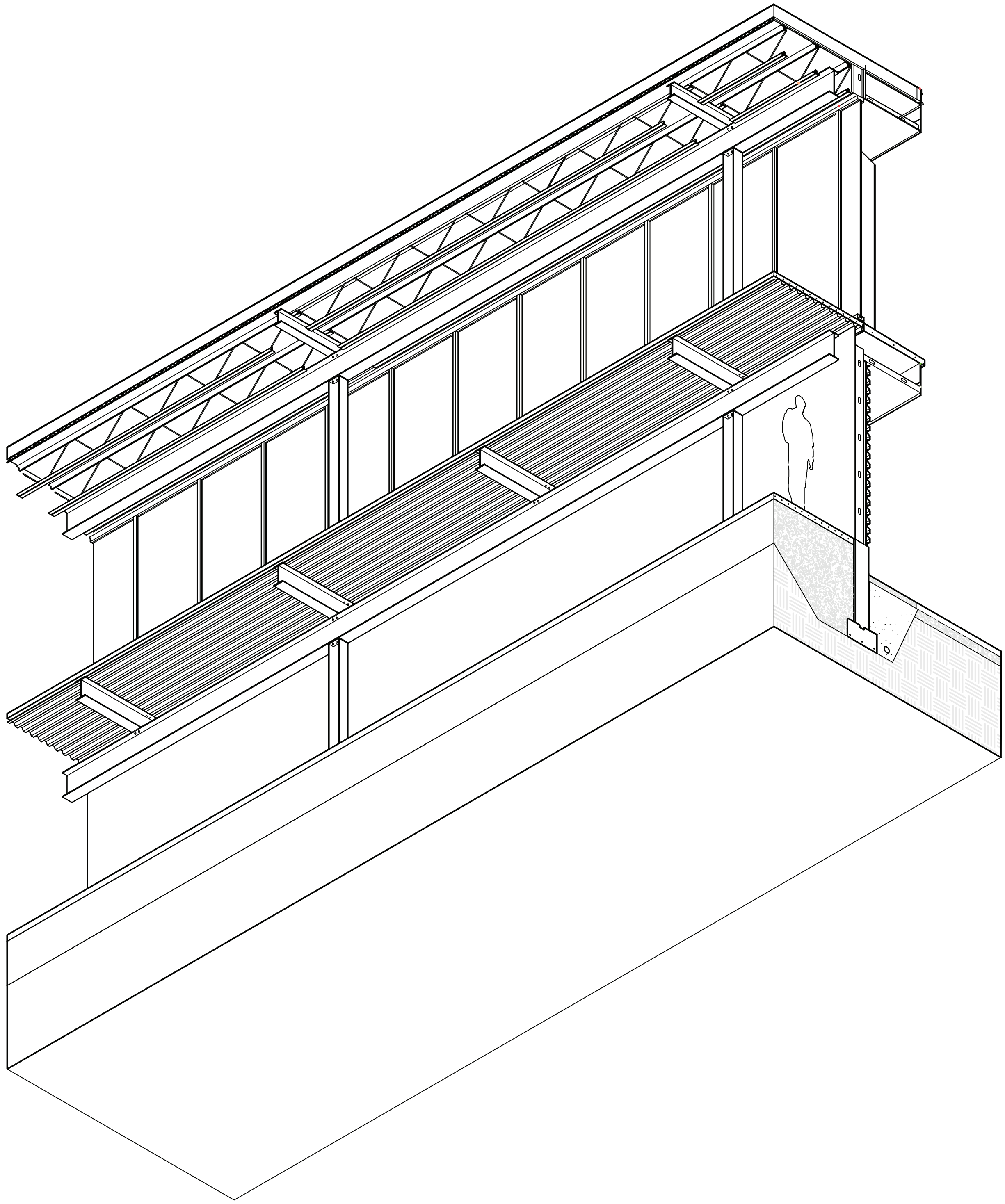
YEAR Spring 2018



1 EXPLODED AXONOMETRIC

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. STEEL DECKING
19. WELDED WIRE MESH
20. POLISHED CONCRETESLAB
21. 1" RIGID INSULATION(THERMAL ISOLATION)
22. SLOPED SITE CAST SILL
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



2 ASSEMBLED AXONOMETRIC