ART | SPACE | FORM

YINING ANNIE | CHEN

PORTFOLIO

2020 — 2023

GEORGIA INSTITUTE OF TECHNOLOGY

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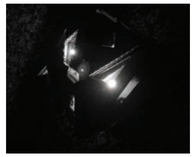

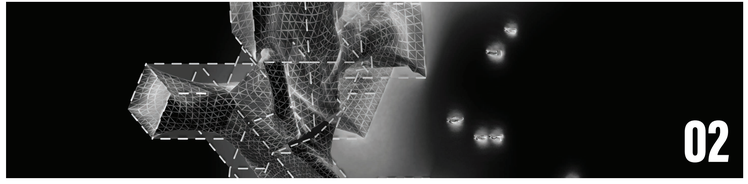

ART | SPACE | FORM

01

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ART | SPACE | FORM

ARCHITECT: BEYOND DESIGN, SHANGHAI, CHINA
LOCATION: QINGDAO, CHINA
YEAR BUILT: 2023
TEAM ROLE: DESIGN ASSISTANT (FOCUS ON ARCHITECTURE)

QINGDAO SINO-FRENCH AKILA LAB

WITHIN THE FOREST, UNDER THE CANOPY

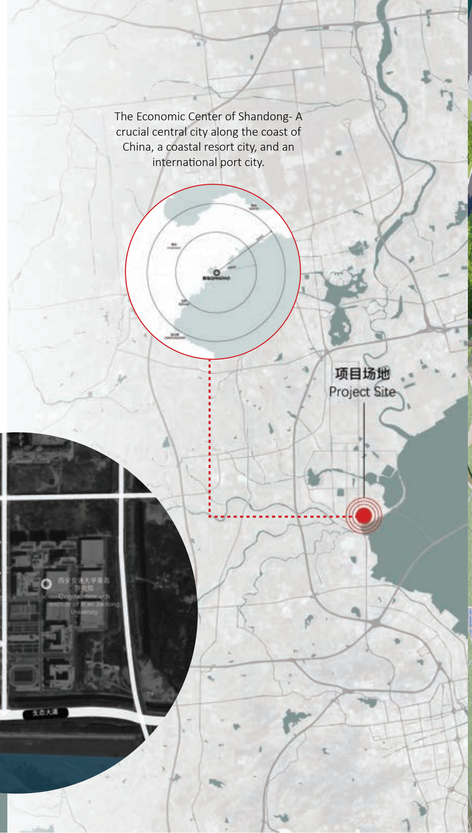
SITE INVESTIGATION

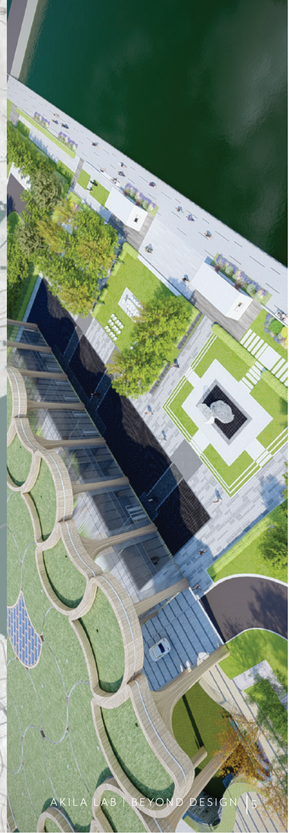
Nestled in the picturesque Qingdao Jiaozhou Economic and Technological Development Zone lies the site in question. This zone boasts a rich history, established in April 1992 and approved as a provincial development zone by the Shandong Provincial Government that same year. The zone's significance was further solidified when, in December 2012, it was approved as a national development zone by the State Council, making it the second such zone in Qingdao.

The Jiaozhou Development Zone is the only container center station in Shandong Province and has six modern industrial bases catering to a range of sectors. These bases are dedicated to CIMC R&D and manufacturing, footwear and apparel, equipment manufacturing, biopharmaceuticals, new energy and materials, and machinery and electronics. With such diverse industries present, the zone has become a hub for innovation and development in the region, attracting businesses and investors alike.

In a significant move that marked Qingdao's emergence as a key player on the global economic stage, the Ministry of Commerce responded in May 2019 by officially supporting the city's bid to establish the country's first "China Cooperation Organization Local Economic and Trade Cooperation Demonstration Zone." This was a significant step in the city's goal of becoming a hub for international trade and economic cooperation.

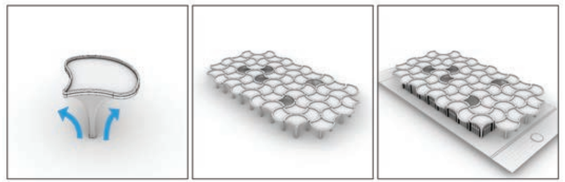
The demonstration zone is set to operate on a development model focusing on logistics, cross-border development, trade, and capacity cooperation. This innovative model will allow the area to actively explore new ways of collaborating with countries in the Shanghai Cooperation Organization (SCO) to form a replicable and popularize SCO's local economic and trade cooperation experience and practice.

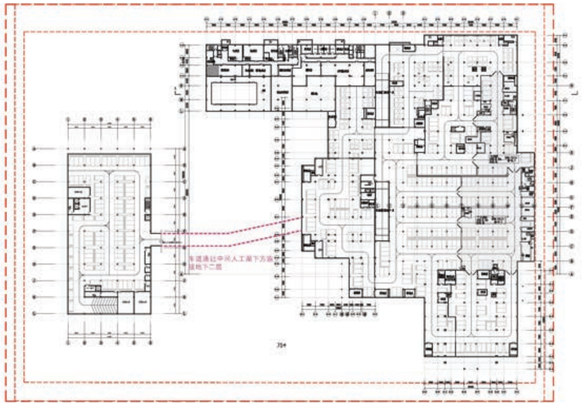




CONCEPT: IRIS ON WATER

The modular design of the Iris pedals structure would consist of a series of identical, lightweight petals made of a durable material such as fiberglass or carbon fiber. The petals would be designed to interlock with one another, creating a seamless, continuous surface that appears as a blooming flower floating on the reflection pool.
Each petal would have a unique shape inspired by the natural form of the Iris flower, with delicate curves and smooth edges that evoke a sense of elegance and beauty. The petals would be painted in a vibrant shade of blue and purple, representing the colors of the Iris flower and symbolizing harmony and unity between the Chinese and French companies.
The structure's modular design would allow for easy assembly and disassembly, making it easy to transport and reconfigure for different events and occasions. The system could also be scaled up or down to fit other spaces and settings, making it a versatile and adaptable piece of public art.
The structure would be on a reflection pool, creating a dynamic interplay between the floating petals and the shimmering water below. The reflection pool would be surrounded by a gently sloping lawn, providing a tranquil and inviting space for visitors to relax and enjoy the structure's beauty.
Overall, the modular design of the Iris pedals structure would be a stunning and innovative piece of public art, showcasing the creativity and collaboration of both Chinese and French design companies while celebrating the natural beauty of the Iris flower.

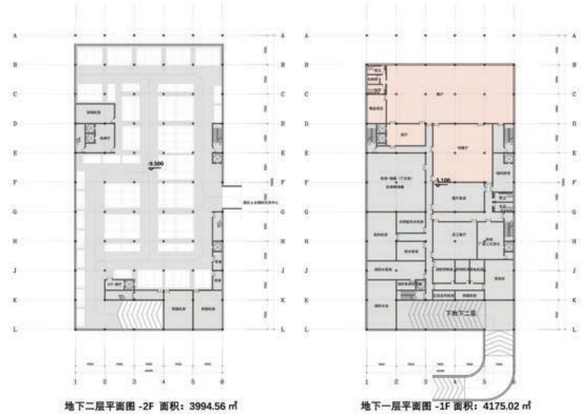


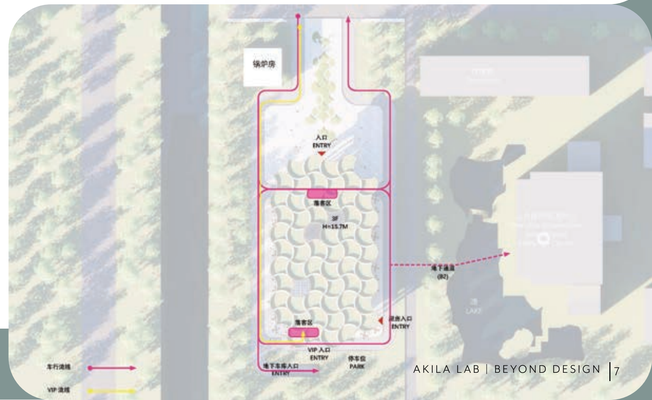


The Akila Lab's B2 level, situated underneath an artificial lake, is a unique architectural marvel that connects directly to the Shanghai Cooperation International Exchange Center. The underground space is designed to be a collaborative hub for technology and innovation, where ideas can be shared and nurtured across cultures and disciplines.

The entrance to the B2 level is located on the shore of the lake, where visitors can descend through a staircase or take an elevator that plunges straight into the space. The underground level is connected to the Exchange Center via a high-speed tunnel, providing a convenient and efficient means of travel between the two areas.

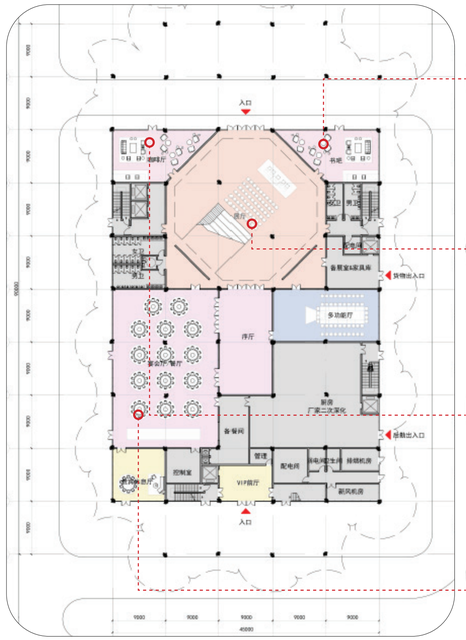
UNDER GROUND PARKING





PLAN+INTERIOR PRECEDENTS

EXHIBITION ROOM



BOOK SHOP

LOBBY

CAFE

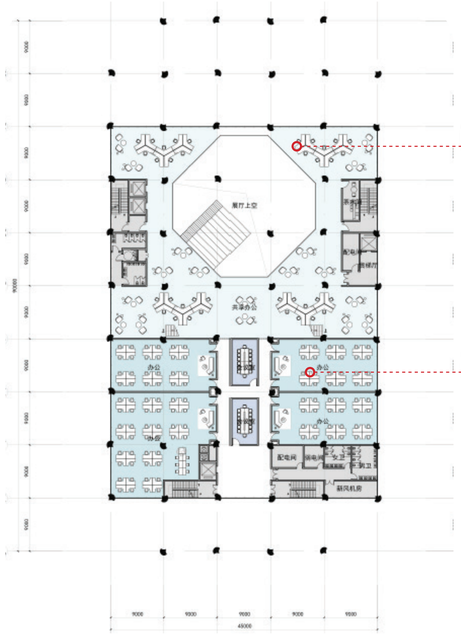
DINING HALL

-F1 FLOOR AREA: 4175.02 m2

F1 FLOOR AREA: 2845.81 m2

LOBBY

PLAN+INTERIOR PRECEDENTS



INNOVATIVE OFFICE

TYPICAL OFFICE

F2 FLOOR AREA: 2401.72 m2

TRAINING ROOM

LOUNGE

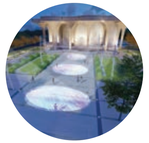
GYM

F3 FLOOR AREA: 1971.25 m2

NORTH PLAZA
Logo | Square

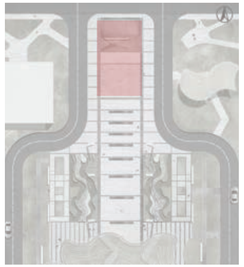
FRENCH LAWN
Eco | Culture

TERRACED GARDEN
Connection

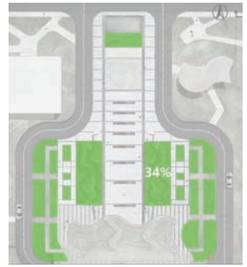


INSTALLATIONS
Art | Technology

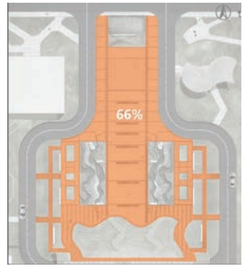
WATERFRONT TRAIL
Experience



ENTRANCE



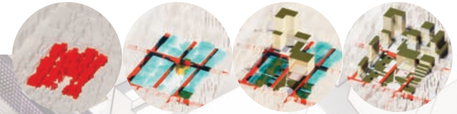
ECOLOGICAL LAWN



PERMEABLE PAVEMENT

LANDSCAPE DESIGN

STAGES OF DEVELOPMENT



HIGH DENSITY X GREEN MOSAIC

高密度グリーンモザイク

TOKYO SMART CITY NIHONBASHI DISTRICT #2

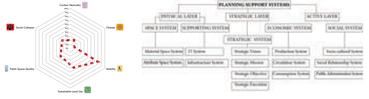
LOCATION: NIHONBASHI, TOKYO, JAPAN
FALL 2023
INSTRUCTOR
Dr. Perry Yang, Georgia Tech
Dr. Akito Murayama, University of Tokyo
Dr. Takahiro Yoshida, University of Tokyo
COLLABORATOR
Jayita Shetty (Architect)
Yining (Annie) Chen (Architect)
Yan (Lucy) Xie (MCRP)
Heather Mase (MCRP+MSGIST)

The project aims to explore a method of data-driven urban design, and how digital urban technologies enable architects and planners to comprehend cities, urban spaces and architecture from data visualization, mapping, modeling, performance evaluation to architecture and urban form making. The project aims to design a smart urban district that is carbon neutral, climate resilient and post-covid-19 conscious.

A MOSAIC OF LEAVES AND STEMS, WEAVING NATURE'S HUES INTO URBAN GEMS.

SITE CONTEXTS

KPI RESULTS: EXISTING CONDITIONS



THE STORY OF THE CITY

WHY HIGH DENSITY?

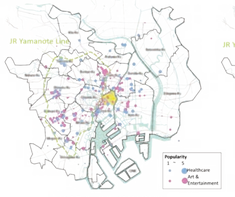
Opportunities Brought by New System of Transportation

Urban Center Relocation & Nihonbashi Revitalization

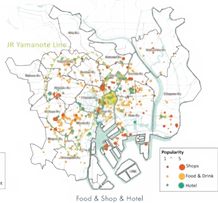
NIHONBASHI Commercial Center in the Edo Period

Expansion & Collaboration

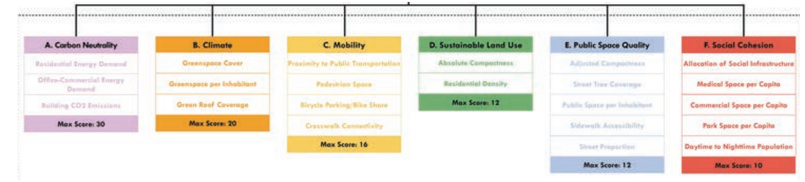
Venues with high foot traffic in Central Tokyo
Using Twitter API Data 05/06/2023



Art & Entertainment & Healthcare



Food & Shop & Hotel



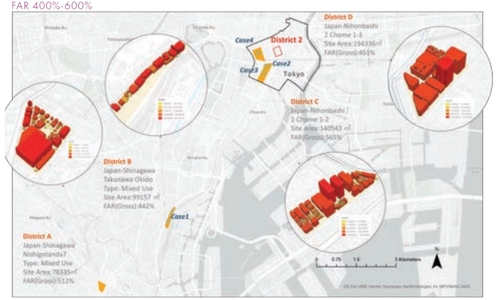
KEY PERFORMANCE INDICATORS EVALUATION FRAMEWORK

THE STORY OF THE CITY

CURRENT STUDY + FUTURE PLAN & IMPACT

CURRENT HGIH DENSITY BLOCKS IN NEIGHBORING AREA

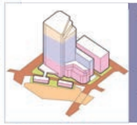
FAR 400%-600%



HIGH DENSITY GREEN PROTOTYPE :

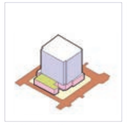
Less surface greenery, using green roofs or underground parks

GATEWAY OF SHINAGAWA
FAR 368%

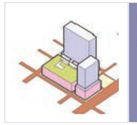


1-CHOME CENTRAL DISTRICT
FAR 1276%

- *Free and open ground floor commercial space, Pedestrian circulation linking retail stores, transit stations, and open spaces. Pedestrian spaces enable access on foot to the surrounding area and stations*
- *Retreating platform, mixed-use buildings, diversity of vertical building usages*
- *Different levels of connection and echoing: Buildings connected to each other*



COREDO TERRACE
FAR 946%



NIHONBASHI GALLERIA
FAR 1101%

- *Preserve the site's historic buildings, connected with new buildings*
- *Higher percentage buildings, greenery on roofs or terraces*

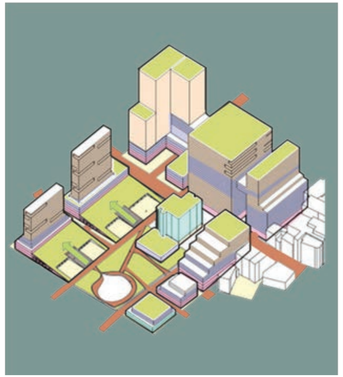
Green Solutions for Urban Ecology System

Canal revitalization and Commercial network

PROTOTYPE - OUR PLAN IN THE FUTURE...

HIGH-DENSITY GREEN MOSIAC

FAR 600%



Scenario for Nihonbashi Site2: High-Density Green Mosaic

Including urban growth, land use and environmental impact estimation

Urban Growth Projection

Environmental Impacts（Daily）

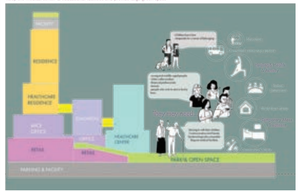
MIXED-USE PROTOTYPE - OUR PLAN

IN THE FUTURE

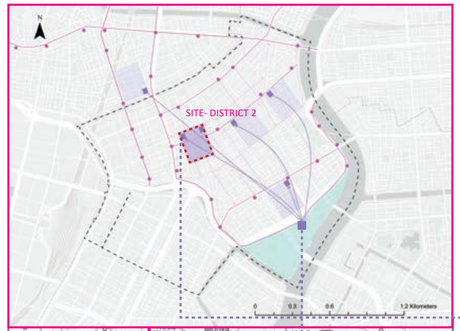
PROVIDE MULTY-GENERATIONAL HOUSING

+3400 Employee, +1370Residents

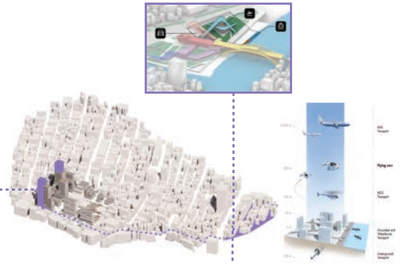
Keep the medical center & educational facilities and provide large green space

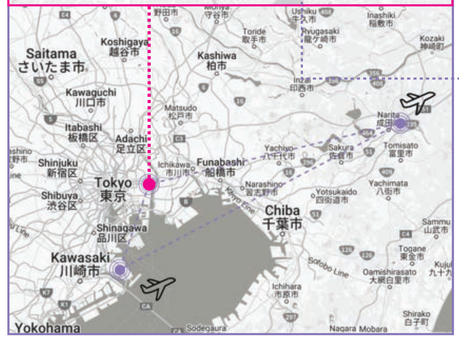


MAPS OF NEW TRANSPORTATION



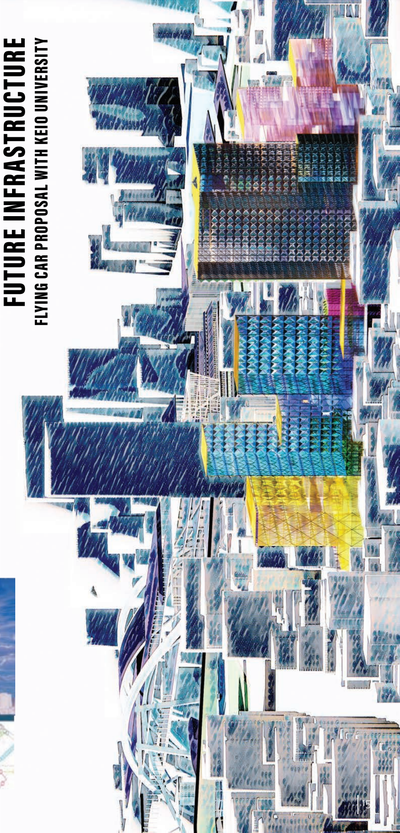
- SITE OF KEIO'S PRACTICE
- NEW PROPOSED BUS STOPS
- VERTICAL PARKING PORTS
- BUS ROUTES CONNECTING FLYING CAR SITE AND THE CITY
- PEDESTRIAN NETWORK





Traditional urban centers inspired by Metro-systems

どの伝統的な交通システムから着想を得たシティセンター

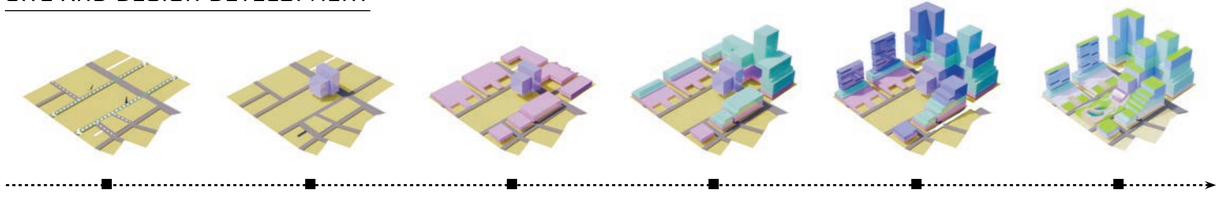


FUTURE INFRASTRUCTURE

FLYING CAR PROPOSAL WITH KEIO UNIVERSITY

DESIGN PROPOSAL

SITE AND DESIGN DEVELOPMENT



Merging plots and segragating vehicular and pedestrian streets

Redesigning the existing Amenities

Commercial zones connected with the green area on ground level

Offices spaces connected with common podium

Residential floors connected with green corridors

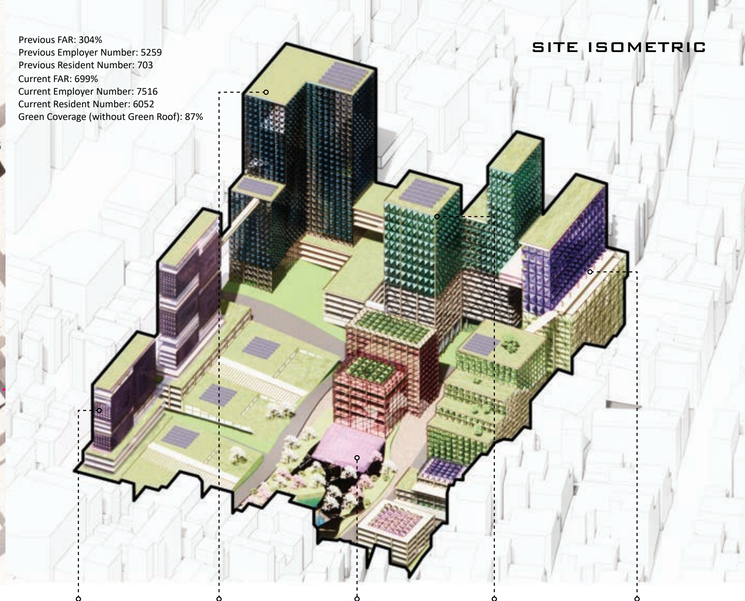
Retention park at the center of the development

SITE PLAN

The objective is to achieve a balance between the population of the district engaged in work and the one residing there by providing more multi-generational housing options. This will enable the inhabitants to enjoy their living experience in a more convenient manner. Furthermore, enhancing the accessibility of green spaces is also one of our prime goals. This has been accomplished by introducing a central park and green roofs, leading to an increase in the green coverage area up to 87%.

Previous FAR: 304%
Previous Employer Number: 5259
Previous Resident Number: 703
Current FAR: 699%
Current Employer Number: 7516
Current Resident Number: 6052
Green Coverage (without Green Roof): 87%

SITE ISOMETRIC



MULTI-FUNCTIONAL COMPLEXES

VERTICAL PARKING PORT

CENTRAL GARDEN

GREEN ROOF

SOLAR PANELS

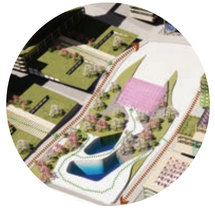
EXISTING TOPOGRAPHY RETAINED FOR WATER RETENTION

WATER RETENTION POND TO HOLD AND DISTRIBUTE WATER

Max Capacity - 33,14,865 gal. (approx)

CULTURAL CENTER APPROACHED FROM THE PARK

GREEN SLOPES CONNECTING THE PARK AND THE BUILDINGS



PARK CIRCULATION

SECTION A- WATER RETENTION PARK

SECTION B- EARTHWORK

- REFILLED LAND
- REMOVED LAND

300 FT

220 FT

160 FT

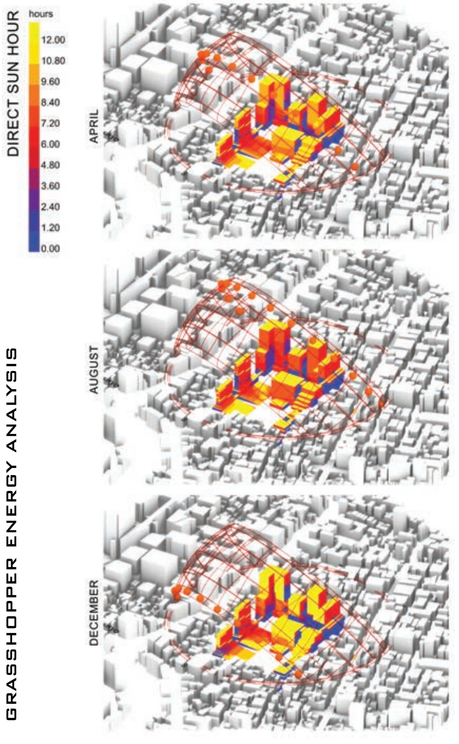
110 FT

40 FT

20 FT

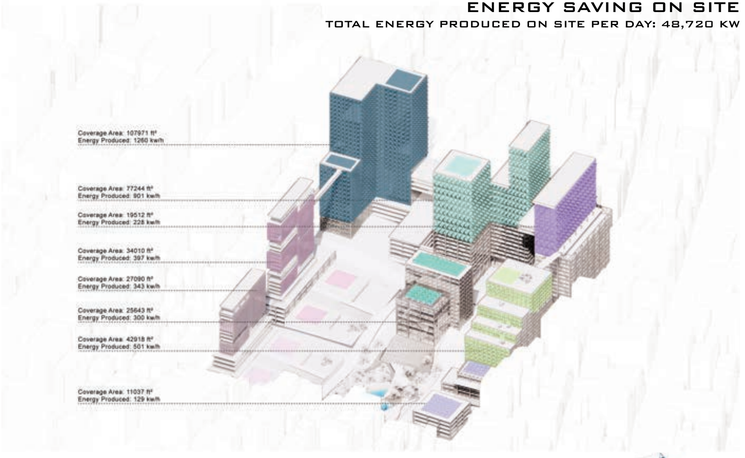
-30 FT

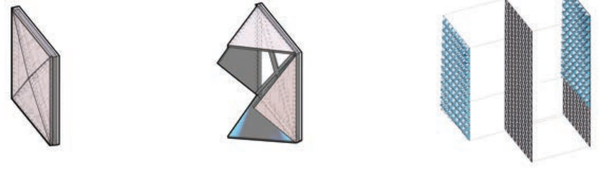
GRASSHOPPER ENERGY ANALYSIS



ENERGY SAVING ON SITE

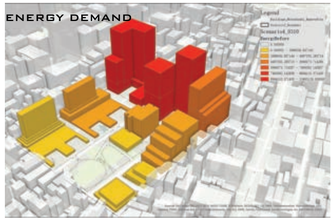
TOTAL ENERGY PRODUCED ON SITE PER DAY: 48,720 KW

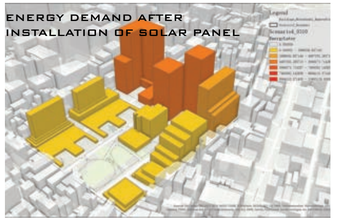


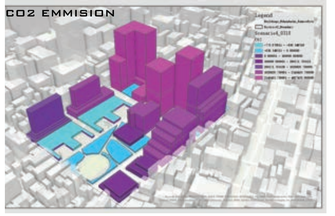


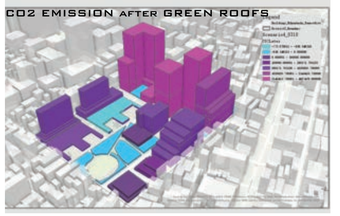
LONG SUN HOURS (≥5 RHS) SHORT SUN HOURS (<5 RHS) INSTALLATION- PANELS + GLAZING

The building is covered with solar panels that not only generate solar energy but also enhance the building's appearance. These panels are designed to align with the sun's movement, producing energy for on-site use and returning any excess energy to the grid. The installation includes two layers: one for shading and another for regular glazing. Through analysis using grasshopper scripts, it was determined that the southeast and southwest facades receive the most direct sun, making them ideal for the placement of the solar panels. Calculations have been made to determine the coverage and energy production of the panels for each building on the site, resulting in a total energy production of 4060 kW per hour. Visual representations and diagrams for April, August, and December demonstrate the duration of direct sunlight on the building surfaces.







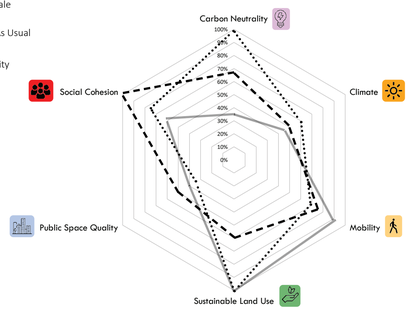


Total Energy Demand:
38,914,670 kWh
Normalized Energy Demand:
11.33 kWh/m2
Total CO2 Emissions:
17,589,472 kg
Normalized CO2 Emissions:
5.12 kg/m2
Solar Energy Offset:
17,778,420 kWh
Offset Energy Demand:
19,792,014 kWh
Normalized Offset Demand:
5.76 kWh/m2
Offset CO2 Emissions:
8,945,990 kg
Normalized Offset Emissions:
2.61 kg/m2

Assessment of District Two High-Density Group

	Indicator	Minimum Objective	Desirable Objective	Actual	Points Earned		Max. Points
	Residential Energy Demand	<80 kwh/m2	<65 kwh/m2	79.54 kwh/m2	6	/	10
	Office-Commercial Energy Demand	<125 kwh/m2	<110 kwh/m2	61.83 kwh/m2	10	/	10
	Building CO2 Emissions	<30 kg CO2/m2	<20 kg CO2/m2	27.30 kg CO2/m2	8.3	/	10
	Greenspace Cover	50%	100%	87%	8.7	/	6
	Greenspace per Inhabitant	>10 m2/inhabitant	>15 m2/inhabitant	4 m2/inhabitant	0.4	/	6
	Green Roof Coverage	>10%	>60%	97%	8.0	/	8
	Proximity to Public Transportation	>80%	>100%	65.4%	3.4	/	6
	Pedestrian Space	>60%	>75%	30.09%	0.5	/	2
	Bicycle Parking	Compliance	Compliance + Designated Bicycle Parking	Compliant	6.0	/	6
	Crosswalk Connectivity	>80%	100%	40.00%	0.5	/	2
	Absolute Compactness	>10 m for min. 50% total land area	>10 m for min. 75% total land area	20.05m	6.0	/	6
	Residential Density	>80 unit/ha	>100 unit/ha	470.33unit/ha	6.0	/	6
	Corrected Compactness	10-50m for min. 50% total land area	10-50m for min. 75% total land area	77.76 m. 25.78%	1.8	/	4
	Street Tree Coverage	50 trees/km	70 trees/km	0.21 trees/km	0.0	/	2
	Public Space per Inhabitant	10 m2/inhabitant	15 m2/inhabitant	0.41m2/inhabitant	0.0	/	2
	Sidewalk Accessibility	>90% sufficient	>90% ideal	100%	2.0	/	2
	Street Proportion	>50% sufficient	>50% ideal	29% sufficient	0.4	/	2
	Allocation of Social Infrastructure	>10%	>15%	3.77%	0.4	/	1
	Medical Space per Capita	>0.6 m2	>1 m2	4.64 m2	1.0	/	1
	Commercial Space per Capita	>0.001 m2		0.03 m2	2.0	/	2
	Park Space per Capita	>2 m2	>3.5 m2	0.43 m2	0.2	/	2
	Daytime to Nighttime Population Ratio	<6.0	<1.2	1.09	4.0	/	4
				Total Score:	71.6	/	100

KPI RESULTS: DESIGN SCENARIOS

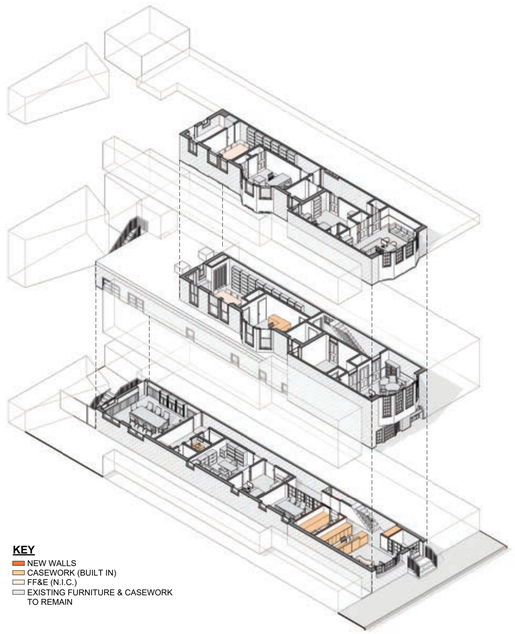


STROKOFF AND COWDEN LAW FIRM RENOVATIONS

224 PINE STREET, HARRISBURG, PA

The 3 story 5,000 sf historic building at 224 Pine Street in Downtown Harrisburg dates to 1867 and was purchased in summer of 2023 by the new leaders of STROKOFF and COWDEN law firm, to be their new home. CDA has been tasked with creating a more welcoming entrance, reception, and waiting space as well as upgrades to the main conference room, restrooms, etc. throughout.

The project's focus on the ground floor encompasses tasks such as flooring, ceiling, and lighting enhancements, painting, improvements to the kitchenette, bathroom upgrades, customization of casework, and miscellaneous finishes.



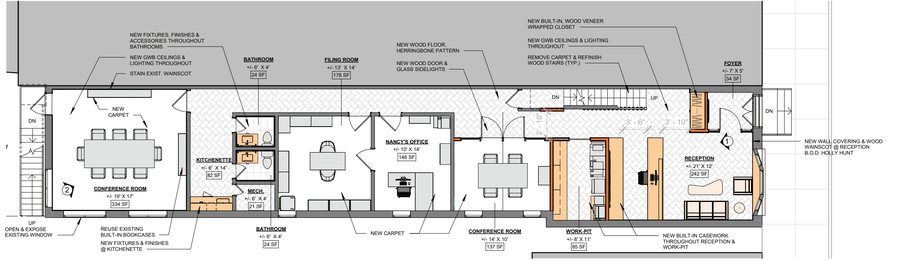
FOUR INTERIOR FOCUSES

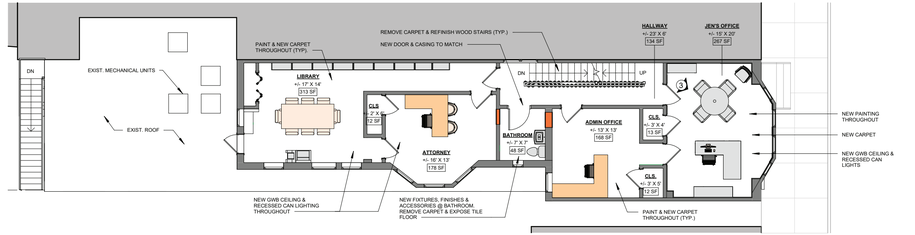
RECEPTION

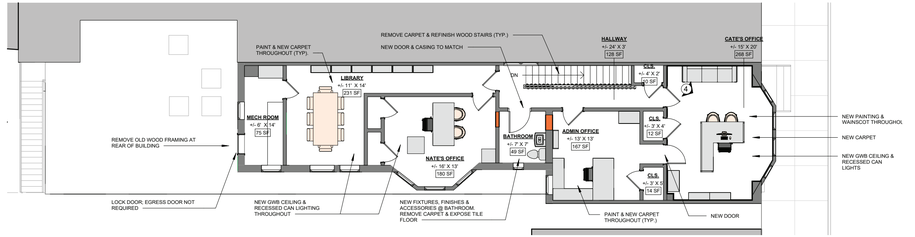
BATHROOM

MEETING

KITCHENETTE







N

10 ft

1

2

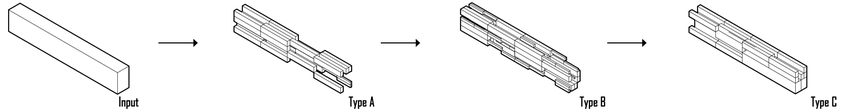
3

4

CITY FARM

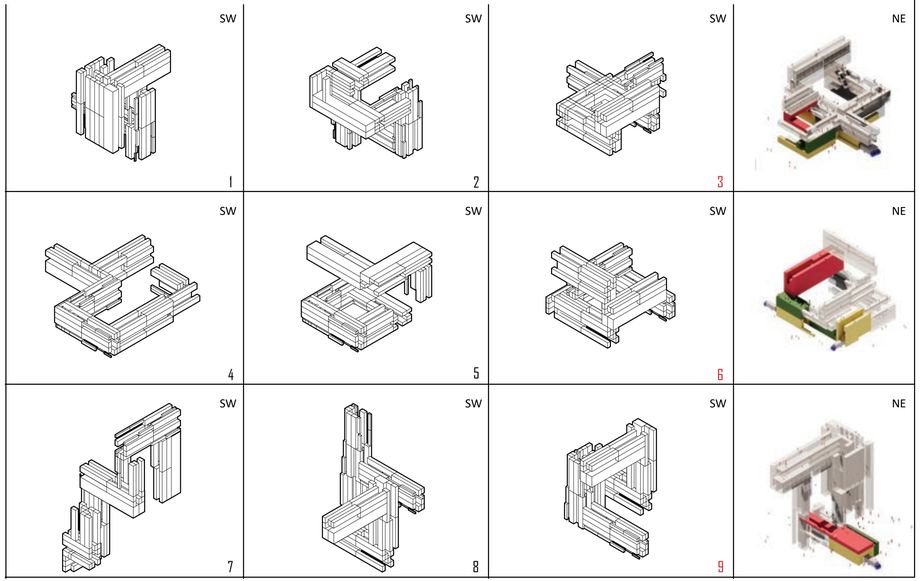
HYDROPONIC GREEN EXPERIMENT IN SHANGHAI

Course: Core Studio II
Instructor: Keith Kaseman
Spring 2021



ASSORTMENT EXPERIMENT- ISOMETRIC

STORAGE | LOADING DOCK | LABORATORY+ OFFICES | EXHIBITION/ HYDROPONIC FARM



INITIAL IDEA- OC TREE BLOCKS PROTOTYPING+ SITE

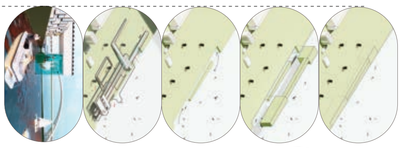
KEY SYSTEMS/ PROGRAMS

SECTION

INFORMATION CENTER/ SOLAR PANELS

The solar panel is one of the significant energy sources for the building to run. All the panels on the roofs are Concentrator Photovoltaic (CPV) Panels. CPV panels are equipped with solar trackers, mirrors, and lenses to capture as much sunlight as possible. At the same time, their cooling systems ensure that this sunlight is converted into energy as efficiently as possible.

INTERNAL DOCK FOR FERRIES



CULTIVATION LAB

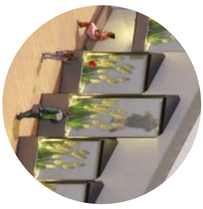
The cultivation lab grows seedlings which will be future exhibits in the hydroponic tanks.

ROBOT DISTRIBUTION

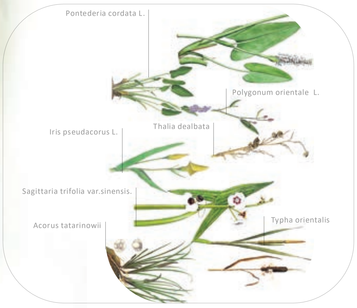
The distribution system allocates robots to clean the tanks and the gallery. The distribution center collects data on the building and monitors the hydroponic system, including basic information, for example, the water temperature, lighting condition, and sanitary situation.

HYDROPONIC EXHIBITION TANKS

The system includes a hydroponic system embedded in the tanks for exhibition and educational purposes. The users can experience the "gallery of greens" from the structure's exterior and interior. The potential categories of plantation for the exhibition are listed in the index.



PLANTS RESEARCH INDEX



SECTION

OFFICE+GALLERY+DOCK

0 25 50 ft

VIEWS
ACTIVITY SPACES

LONG PLANTATION GALLARY

The gallery intends to provide a sense of openness and transparency, allowing visitors to see through the walls and better view the surrounding environment, especially the great Lupu Bridge. The inflow of natural light and unobstructed views enhance the overall viewing experience. The exhibition space incorporates living plants into its design. These "botanical galleries" creates a unique and immersive environment that can enhance the viewing experience for visitors of both the interior and exterior space.

RAMP TRACK #01

The ramp track, which leads to the semi-open gallery, provides an exciting and challenging experience: Ramp tracks intend to promote physical activity and fitness: Using a ramp track requires a high level of physical fitness and stamina. It allows individuals to engage in a fun and exciting physical activity that can improve their overall health and well-being. Moreover, the tracks aim to encourage creativity and self-expression: Ramp tracks offer a creative outlet for riders to express themselves through their movements and tricks. They can experiment with different techniques and develop their unique style.

BREEZEWAY

The breezeway intends to improve air circulation: with an open triangular window and perforated aluminum roof, the breezeway provides an open space that allows for natural air circulation, which can help to reduce humidity and improve indoor air quality. By allowing for natural ventilation, a breezeway can lessen the need for air conditioning and other cooling systems, lowering energy bills and reducing environmental impact. It is a buffer zone between two gallery spaces, which can help to increase privacy and reduce noise pollution.

RAMP TRACK #02

Besides merits that improve citizens' physical activities, the ramp tracks could also foster a sense of community: Ramp tracks often attract a community of like-minded individuals who share a passion for extreme sports. They provide a space for people to come together, connect, and support each other in their pursuits. In addition, this ramp might also boost tourism and economic development, along with the EXPO pavillions right next to it: Ramp tracks can be a new popular attraction for visitors and contribute to the local economy by attracting tourists and generating revenue for businesses in the area.

OFFICE SPACE

Besides merits that improve citizens' physical activities, the ramp tracks could also foster a sense of community: Ramp tracks often attract a community of like-minded individuals who share a passion for extreme sports. They provide a space for people to come together, connect, and support each other in their pursuits. In addition, this ramp might also boost tourism and economic development, along with the EXPO pavillions right next to it: Ramp tracks can be a new popular attraction for visitors and contribute to the local economy by attracting tourists and generating revenue for businesses in the area.

BOTANICAL ART GALLERY

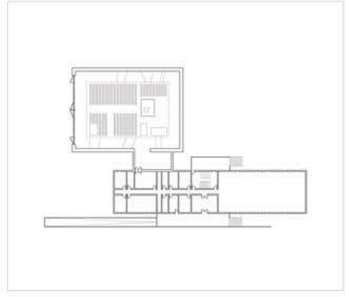
The botanical art gallery intends to celebrate the beauty of nature, promote scientific knowledge, encourage creativity, foster a sense of community, and provide educational opportunities.

BOX MORPH

Course: Core Studio III
Instructor: Daniel Baerlecken
Summer 2022

FORMING PROGRESS A- ORIGINAL PLAN

San Paolo Church in Foligno
Section
Scale: 1/16"= 1'- 0"

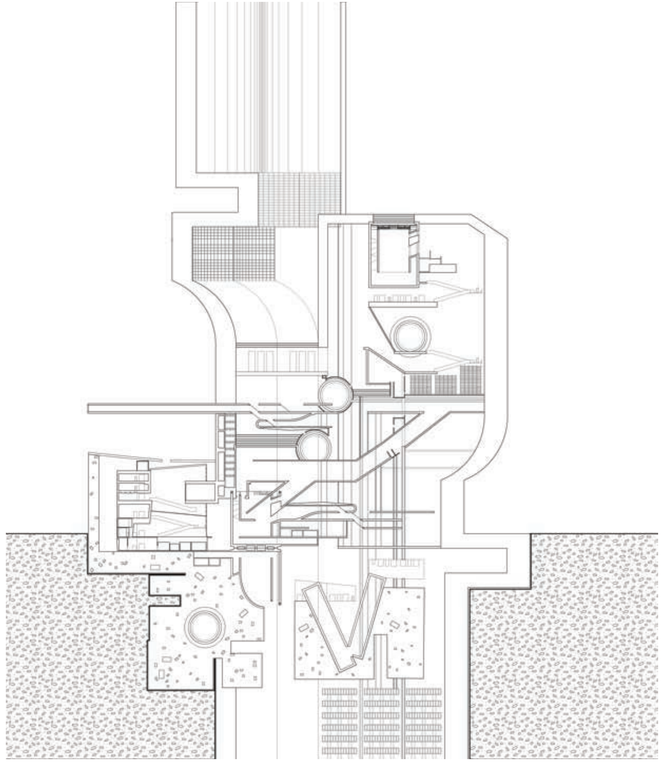


San Paolo Church in Foligno
First Floor Plan
Scale: 1/16"= 1'- 0"

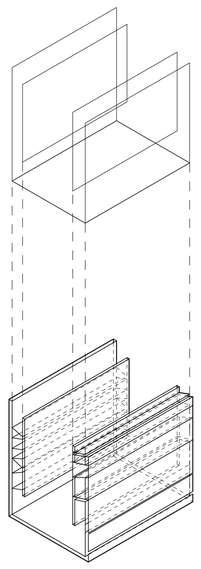
2001
FUKSAS, Massimiliano Fuksas + Doriana Mandrelli Fuksas
Suspending + Layering

0 16 32 64

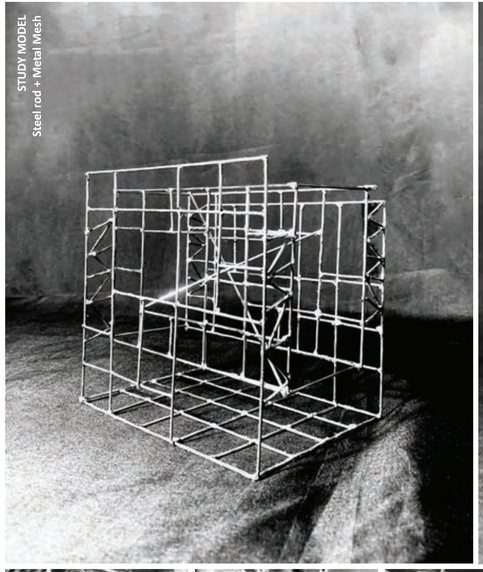
FORMING PROGRESS B- PLANS AND SECTIONS OVERLAY



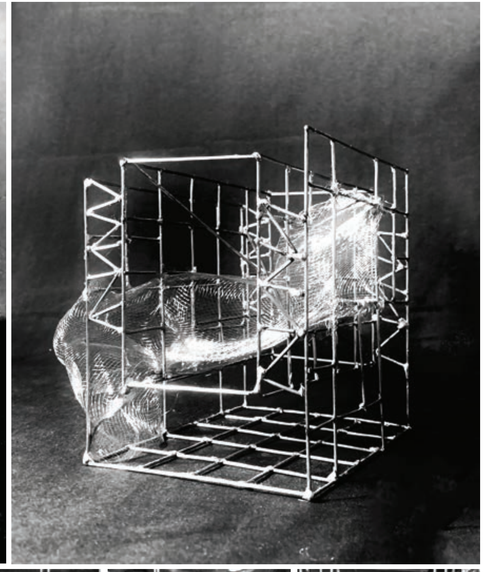
FORMING PROGRESS C- PHYSICAL MODEL

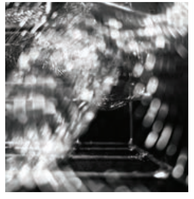


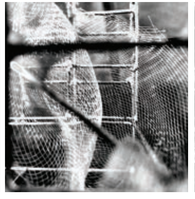
From the plan of the San Paolo to the brainstorming about the overlay of the sections and plans, the design's final form originates from the San Paolo section. Still, it adopts the organic structure from the second stage. Therefore, the cubic framework is adapted with organic mesh in the physical model exploration. The design intends to introduce complexity and irregularity into an otherwise ordered and geometric design. Integrating different forms can add visual interest and texture to the design while maintaining a sense of order and control.

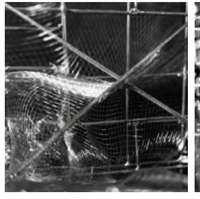


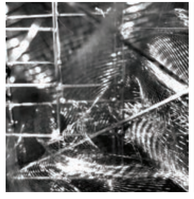
STUDY MODEL
Steel rod + Metal Mesh

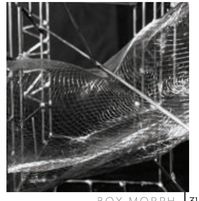




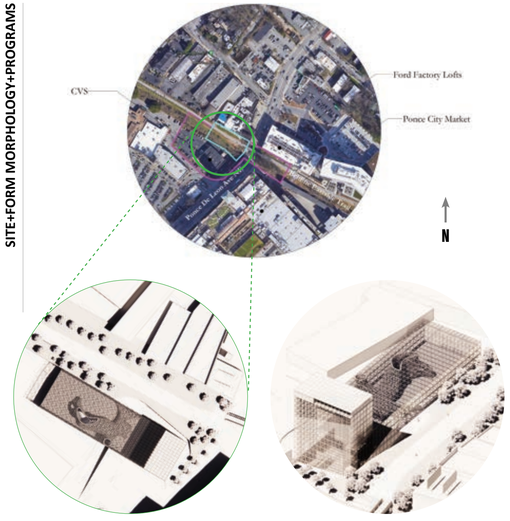




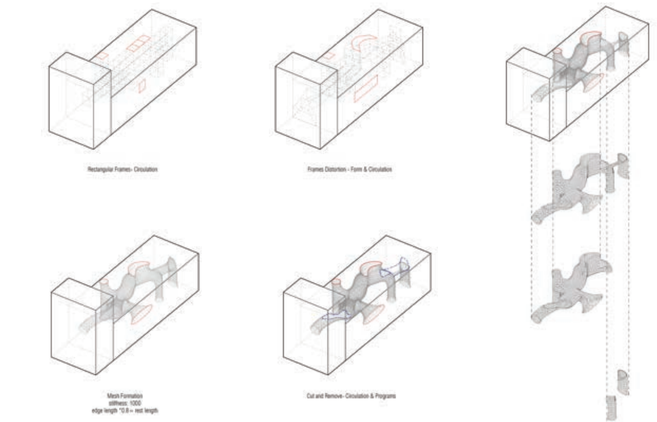




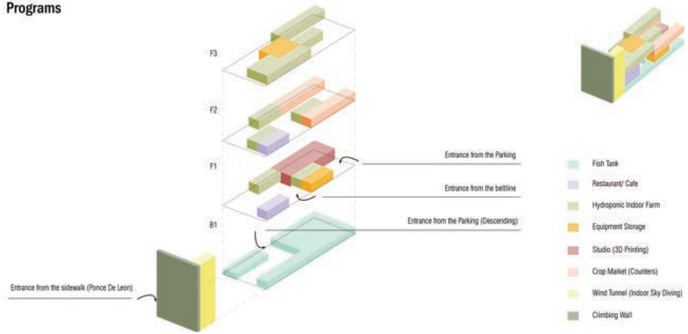
SITE+FORM MORPHOLOGY+PROGRAMS



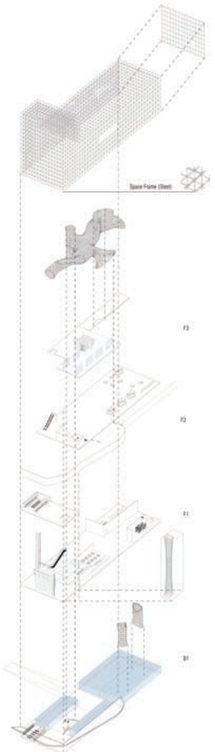
The site is at the Intersection of Beltline and Ponce De Leon Ave NE/Intersection of Subarea 5 and 6 of the Atlanta Beltline. It marks the convergence of two major transportation arteries in the city, the Beltline and Ponce De Leon Avenue, and is a hub of activity and development. The Atlanta Beltline is a multi-use trail and transit system that circles the city, connecting neighborhoods and providing green space and recreation opportunities. The Beltline runs along an elevated section at the intersection of Beltline and Ponce De Leon Ave NE, providing views of the surrounding area. Subareas 5 and 6 of the Atlanta Beltline are two specific sections of the larger Beltline project. Overall, the intersection of Beltline and Ponce De Leon Ave NE and the surrounding Subarea 5 and 6 of the Atlanta Beltline represent a vibrant and growing area of Atlanta, with a mix of historical and modern architecture, green space, and community amenities. With the surrounding business including CVS, Ford Factory, and Ponce City Market, the new project on the site intends to develop another business center that integrates retails, art classrooms, an aquarium, and indoor-outdoor climbing walls for the citizen to relax and enjoy a variety of spatial and programmatic experience near the Beltline.



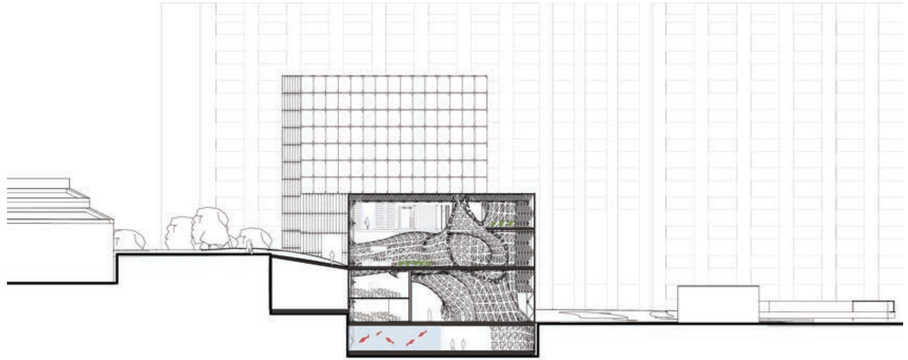
Programs



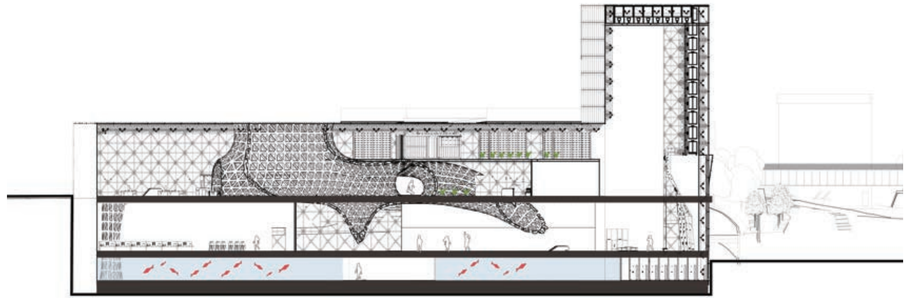
EXPLODED ISOMETRIC- STRUCTURE+PROGRAMS



PERSPECTIVE SECTION- NE



PERSPECTIVE SECTION- NW



BUILDING SYSTEMIC DESIGN

A

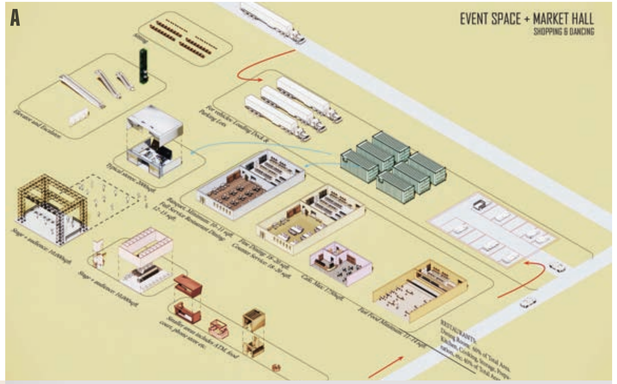
EVENT SPACE+MARKET SPACE

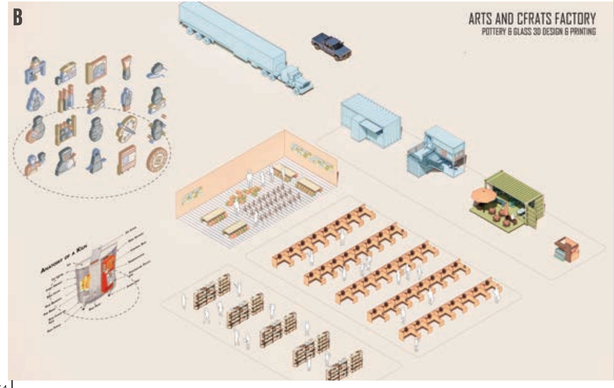
B

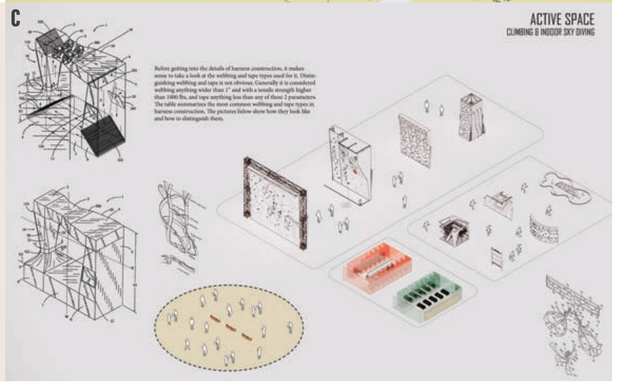
ARTS AND CRAFTS FACTORY

C

ACTIVE SPACE

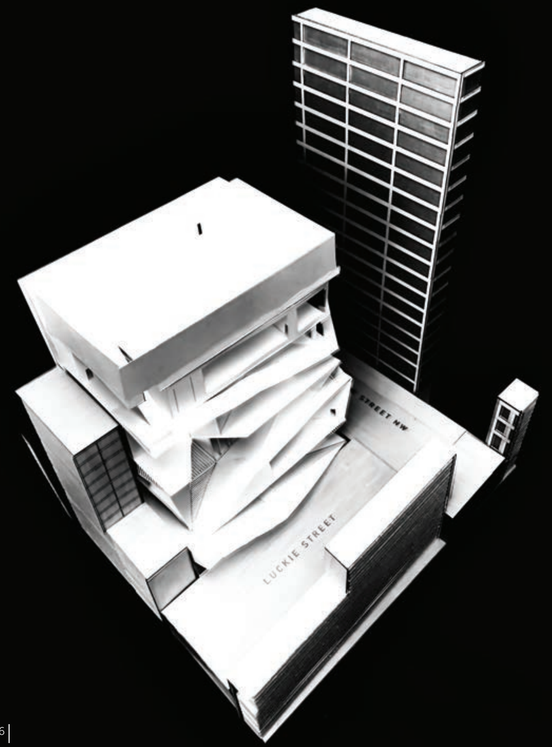






STREET VIEW FROM THE BELTLINE

On the street view, glass box architecture can be seen in buildings with large, transparent windows, often stretching from floor to ceiling. These windows may be framed by metal or concrete or left unframed for a more seamless and modern look. In this design style, the glass box structure features large, transparent windows stretching from floor to ceiling. The overall shape of the building may incorporate more fluid, organic forms. The building may have flowing shapes in its roofline and façade. The use of organic forms in glass box design intends to create a sense of harmony between the building and its natural surroundings, as well as a feeling of movement and energy. It can also soften the stark appearance of the glass box structure and create a more inviting and welcoming atmosphere.



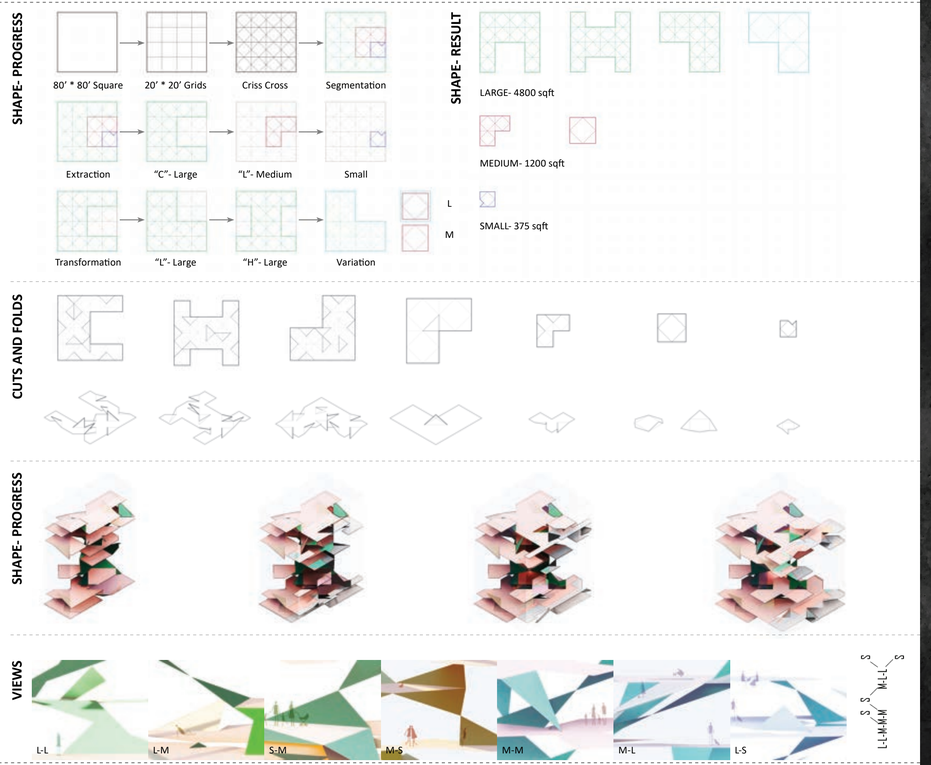
DANCING GYM

WORKOUT IN DOWNTOWN ATL

Course: Advanced Studio I
Instructor: Mark Cottle
Fall 2021

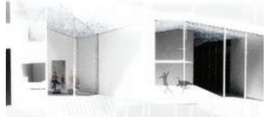
KEYWORD: CUTS AND FOLDS
They connect each plane using the cuts and folds and the natural slope and tilted plane. Due to the constraint of the bound of a box, some of the floors need to be rotated to solve the puzzle. The natural tiled planes form some intriguing moments in space. This investigation inspires the project to create a dynamic space for citizens to socialize and work out.

KEYWORD: TILTED PLATES
The initial idea about the plan of each building floor with an ideal area and height for tilting up and down, the colors distinguish different space functions, and the partial regions are marked out as the desired spaces for green plantation.



PLANS

LEVEL +140



LEVEL +120

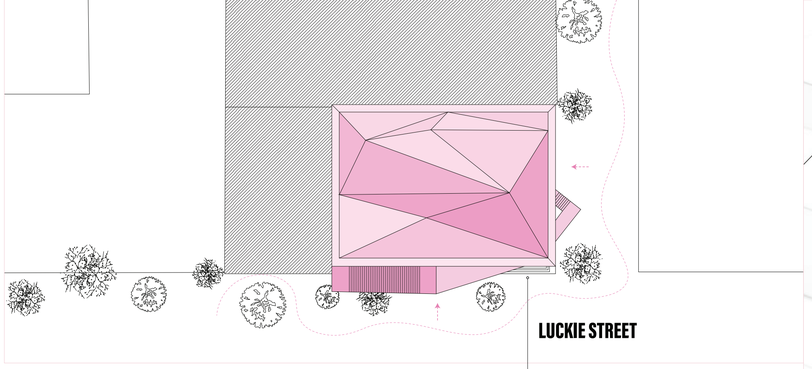
LEVEL +110

LEVEL +95

LEVEL +40

LEVEL +10

LEVEL -5



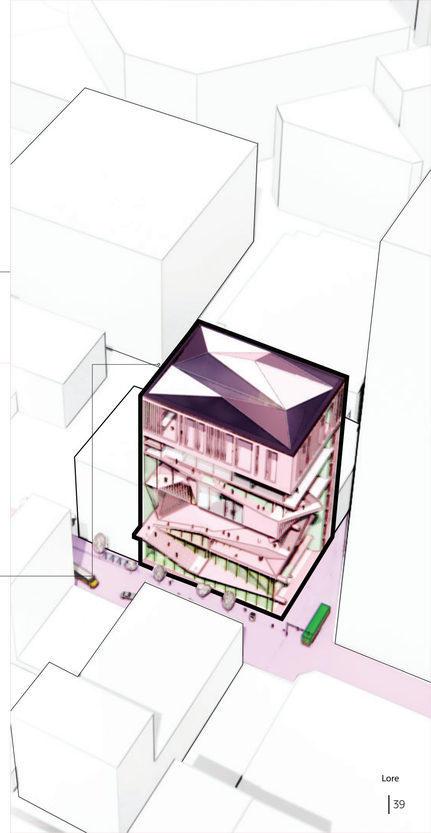
The proposal is for a new recreational center with gyms in Midtown Atlanta, conveniently across from the Rialto Art Center of Georgia State University. The vision for this center is to provide a comprehensive, state-of-the-art facility that promotes physical fitness, wellness, and community engagement.

The recreational center will feature a variety of amenities, including: Multiple fitness rooms equipped with the latest cardio and strength-training equipment; Personal training and coaching services; Group fitness classes, including yoga, Pilates, dance, and cycling; A swimming pool and aquatics area for lap swimming, aquatic exercise classes, and recreational swimming; A sauna and steam room for post-workout relaxation and recovery; A lounge area for socializing and connecting with other members.

In addition to these features, the recreational center will offer a range of programs and activities that cater to different interests and fitness levels. These could include sports leagues, group runs, outdoor adventures, nutrition workshops, and more.The location of the recreational center is particularly advantageous, as it is situated in the heart of Midtown Atlanta and in close proximity to Georgia State University. With its bustling arts scene, thriving business community, and diverse residential neighborhoods, Midtown is the perfect place to launch a new recreational center that appeals to a wide range of people.

The project is committed to creating a space that is welcoming, inclusive, and accessible to all. The staff will be trained to provide exceptional customer service and support to ensure that every member feels valued and empowered to achieve their fitness goals.

The project believes that a recreational center with gyms in Midtown Atlanta will not only enhance the health and well-being of the local community but also contribute to the vibrancy and vitality of the neighborhood.



SECTION+SCENE SEQUENCE

LEVEL +140- VOLLEYBALL COURT+ORCHARD

LEVEL +120- LIBRARY+OFFICE

LEVEL +110- MEDITATION ROOMS

LEVEL +95- DANCING+YOGA

LEVEL +80- GYMNASIUM

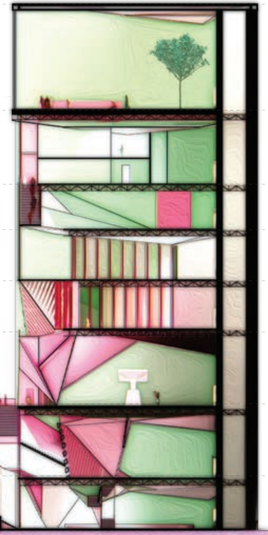
LEVEL +40- BASKETBALL COURT

LEVEL +10- DOG PARK+CLIMBING WALL

LEVEL -5- SWIMMING POOL

SECTION A-A

SECTION A-B



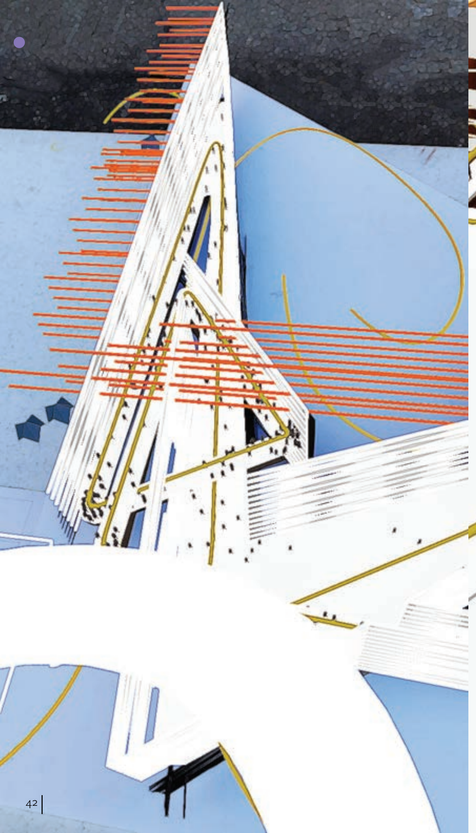
SECTION A-C

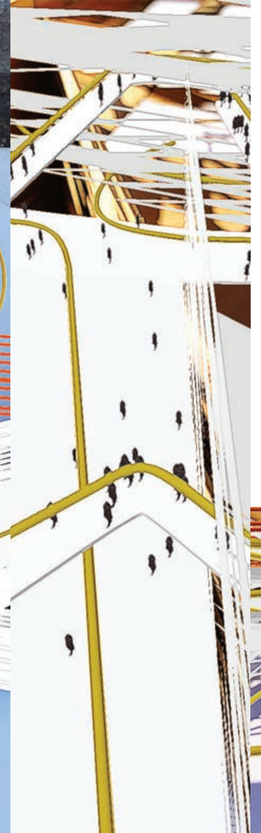
SECTION A-A

SECTION A-B

SECTION A-C

20ft





FLYING NEST

FOLOGRAM AND REAL MODEL MIX

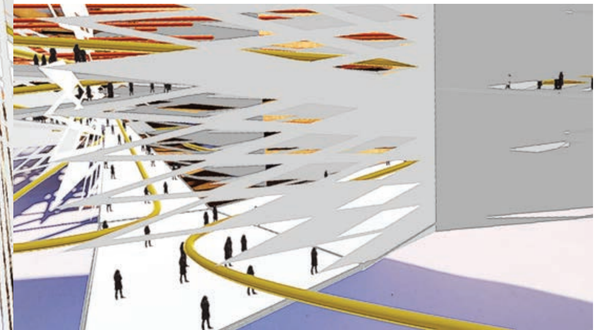
Course: Core Studio II
Instructor: Keith Kaseman
Collaborator: Ian Morey, Annie Yining Chen (Co-desgin)
Fall 2020

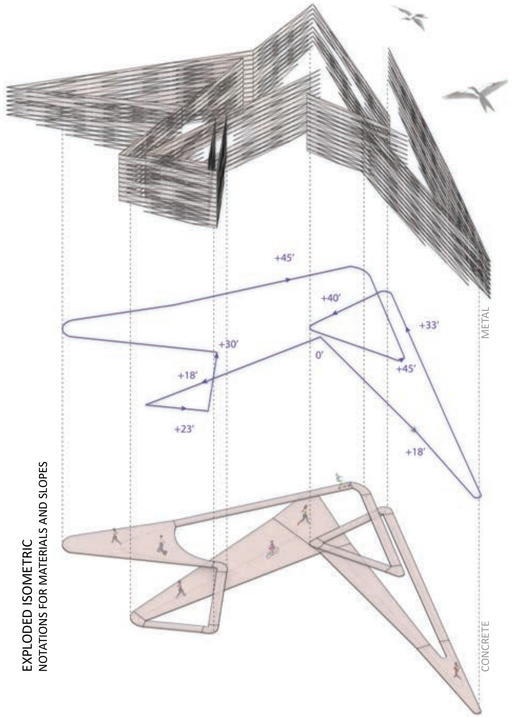
QUARTER-MILE TWIST CHALLENGE

Teams are responsible for refining and delivering a 1/4 MILE TWIST scheme. With the Utilization of cleanly modeled curves and surfaces, the goal is to thicken these spatial constructs into comprehensive architectural proposals incorporating articulated material and structural, programmatic, and situational strategies.

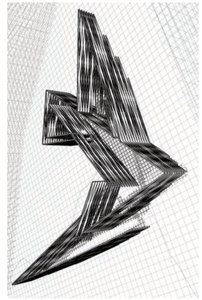
FLYING NEST PROTOTYPE

The idea behind the designed prototype is to construct a monumental public area for citizens and native birds to interact in the center of the cityscapes actively. The citizen could ascend gradually from the base level of the form, stop and rest on the platform at different levels, and then descend to the original start point. The steel pipe thrusting out from the envelope is a temporary habitat for the birds currently living in the city or migrating from other areas.

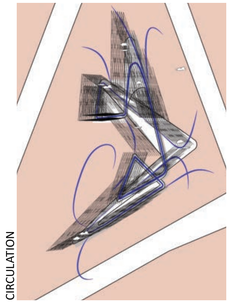




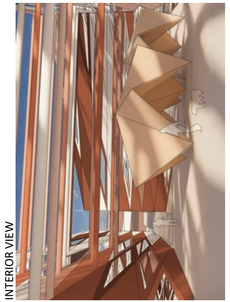
EXPLODED ISOMETRIC
NOTATIONS FOR MATERIALS AND SLOPES



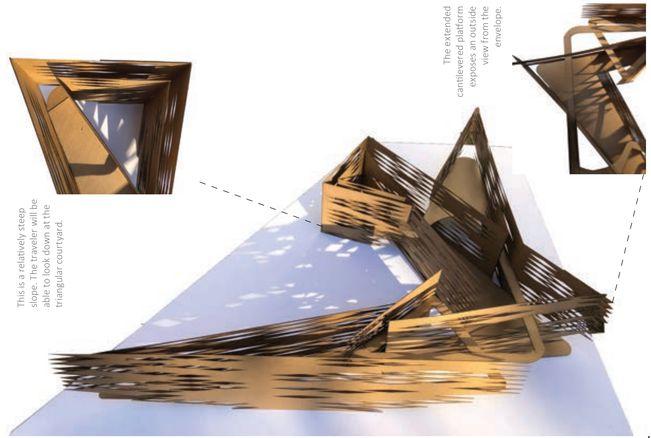
ENCLOSURE ISOMETRIC X-RAY

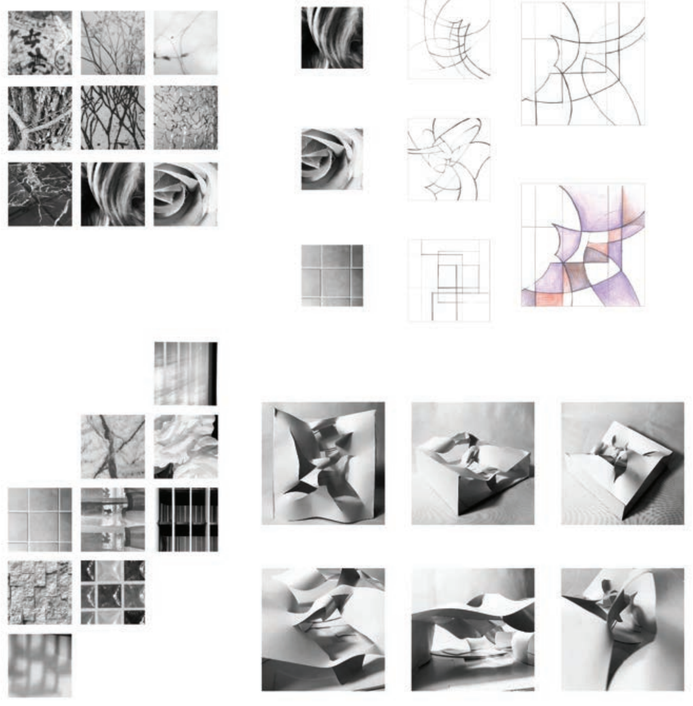


CIRCULATION



INTERIOR VIEW





PHOTOGRAPHY, DRAWING, MODEL #1

POINT, LINE, PLANE

FROM TWO DIMENSION TO THREE DIMENSION

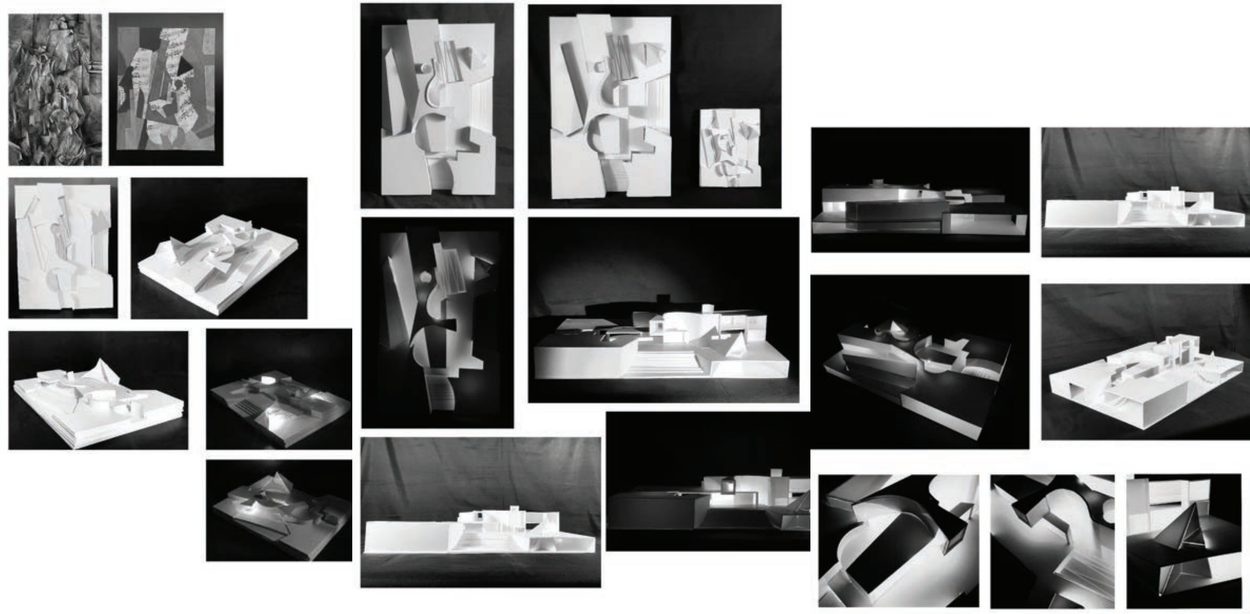
Course: Core Studio I
Instructor: Charles Rudolph
Fall 2020

This exercise begins a sequence of exploratory activities in abstraction involving photography, drawing, and model-making. Each part of the sequence will derive from the one before it and apply both translations, which include a photo to sketch, drawing to model, and iteration, which involves making multiples). In each step of the sequence of design explorations. The following conditions are present in work:

DIFFERENCE / REPETITION FIGURE / FIELD CENTER / EDGE MOVEMENT / STASIS TENSION / REPOSE OPEN / CLOSED

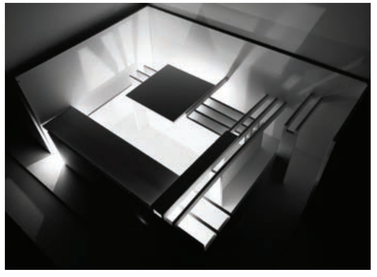
The exploration involves selecting three photos from the group of nine and undergoing a translation process into a line-based drawing, one for each image. The media used for the pictures is a soft drawing pencil. Each illustration is 6" x 6" square on Bristol paper. Experiment using the iterative method, using tracing paper in overlays to test visual and compositional ideas. Use various lines' values to achieve depth, transition, variety, etc. Experiment with compositions refers to the list of "dualities".

The final stage is a translation from two-dimensional drawings to three- dimensional model. Transforming the abstractions of lines and spaces on the flat paper surface to the construction of characters that shape space is a step into architecture– although the critical dialogue of abstraction is maintained and intensified.



PHOTOGRAPHY, DRAWING, MODEL #2

PAINTING AS SITE



THE SOLUTION TO "KIT OF PARTS"

This corner park aims to provide a seggregated and tranquil space in the center of downtown city. The outside high wall ensures the private-intimate interior space. All long and thin kit of parts functions for tectonic use. The paths which lead to the center activity spaces are narrow just so the a sense of mystery is increased when travers-ing through the paths. An open large courtyard in the center is open for public gathering, and two smaller chambers for priviate gathering are parallel to each other. The pavillion-like structures casts a good amount of shades and shelters for visitors.

MODEL #3

KIT OF PARTS

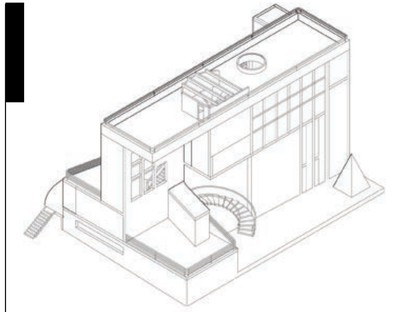
MUSIC HOUSE

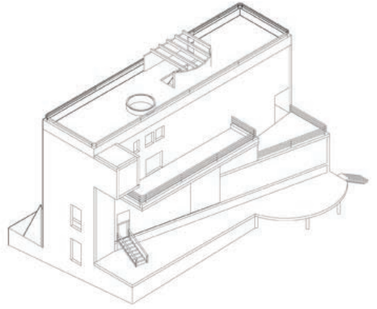
MODELS FUSION MOTIF

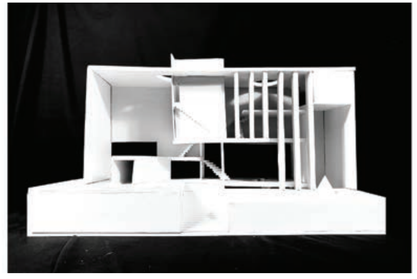
Course: Core Studio I
Instructor: Charles Rudolph
Fall 2020

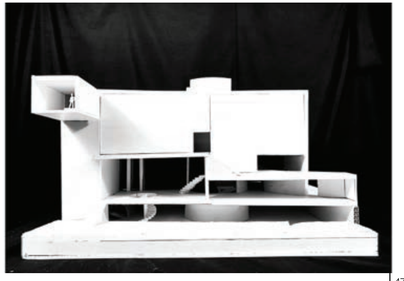
Brief Introduction

This project combines previous models No. 2 and 3, and the site is Lancaster Community Park, Millersville Pike, Lancaster, PA, 1.5 miles and 8 minutes driving to Fulton Theatre for the final design. The model for the corner park is to be rotated 90 degrees. The "ground" becomes a vertical wall. The wall is altered but remains a structural entity that supports stairs and floors. The House negotiates the given forms and spaces of the site. The House aims to provide a comfortable living space for Broadway actors/actresses to spend their vacations, hold after-parties, and socialize.
The highlight of the House is an interior stage at the negative four level and an outdoor stage on the ground level connected by a circulation through the backstage. The backstage between the circulation is a versatile space that could function as a place for make-up, storage, socializing, and a transitional space to the upper level.



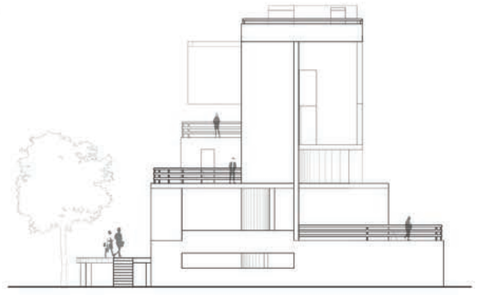




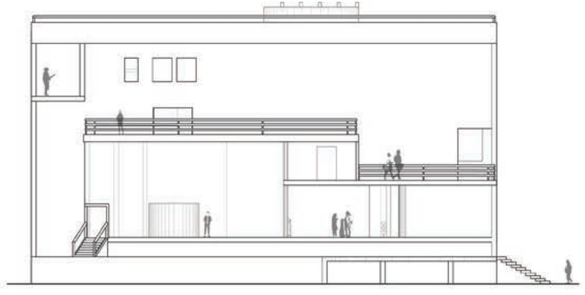


ELEVATION, SECTION

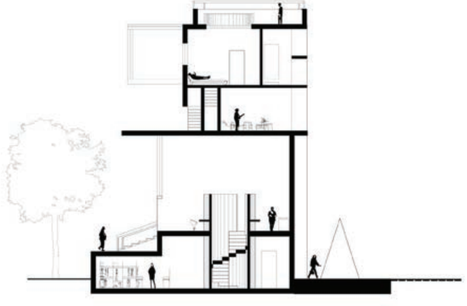
10ft



NW



NE



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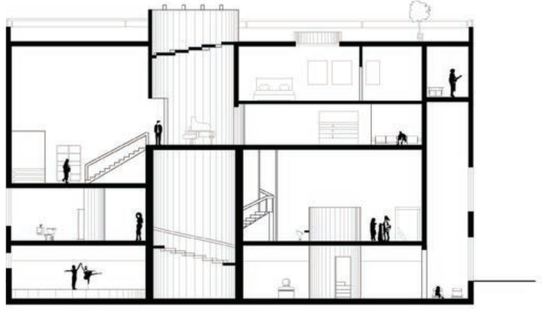
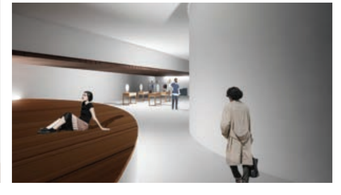


SW



INTERIOR, EXTERIOR

RENDERS

DRAGONBOT

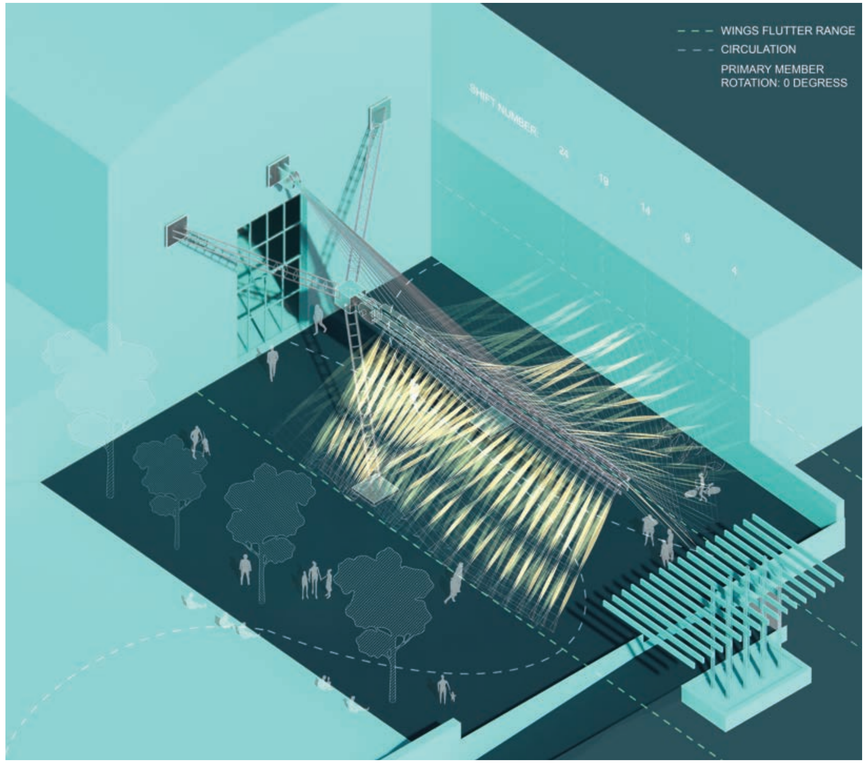
CREATE "MICROCLIMATE" ABOVE THE COURTYARD

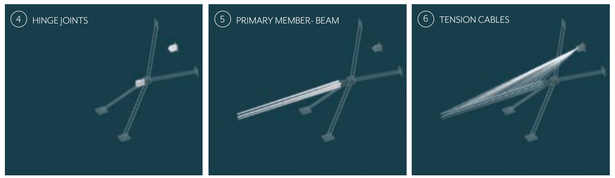
Course: Media and Modeling III
Instructor: Keith Kaseman, William S. Reynolds
Location: 723 CherrySt NW, Atlanta, GA
Team: Yining Chen, Patricia Rangel, Shrutam Prabhu
Responsibility: Wings Design
Fall 2021

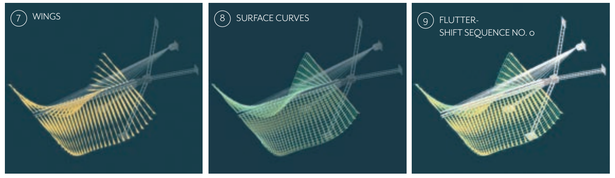
The Hinman Research Building of Georgia Institute of Technology was originally designed as a research facility in 1939. It was later adapted to include graduate-level architecture studios, computer labs, and interdisciplinary research labs.

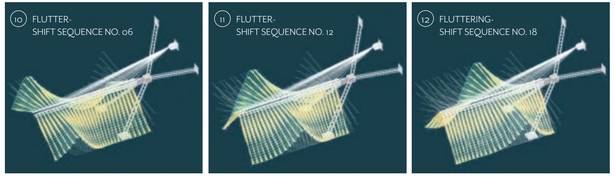
As the former dean of the College of Architecture, Alan Balfour said, "Hinman is the perfect union of the past, present, and future of architectural research and education at Georgia Tech." The building carries all the talents and witnesses the birth of great inspirations and works. The back courtyard of the Hinman Building is a crucial area for the students to socialize, repose, and refresh.

The Dragonbot aims to create a recreational space for the users and visitors of the Hinman Building. The inspiration comes from the shape and movements of dragonfly wings. The high-tech metallic giant installation consists of a prime arm carrying tiny wings fluttering in the air. With the fluttering wings, the Dragonbot creates a breeze and shades above the courtyard during mid-summer time. The designers envision further tech development on the wings to provide heat during winter.



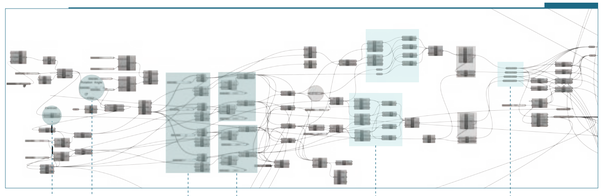






INSTALLATION & MOVE SEQUENCE

GRASSHOPPER DEFINITION- PRIMARY MEMBER BEAM ROTATION



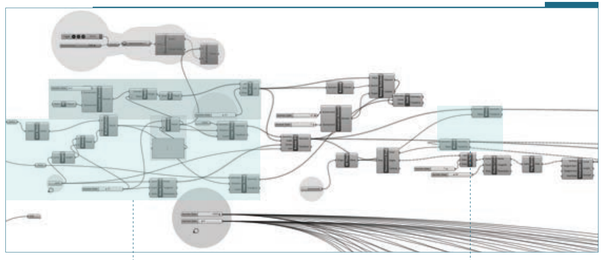
Set the point on the lower Hinge Joint as the Centroid and set the Amplitude/ Rotation angles of the Primary Member

Deconstruct the rotated Primary Members, and list out all the vertices. Move the vertices in a fixed amplitude to confirm the thickness of each member

Connect all the vertices and create the edges of the rotated Primary Member

Make surfaces of the Primary Member out of all the edges. The volume of the rotated Primary Member is later synced with Fologram

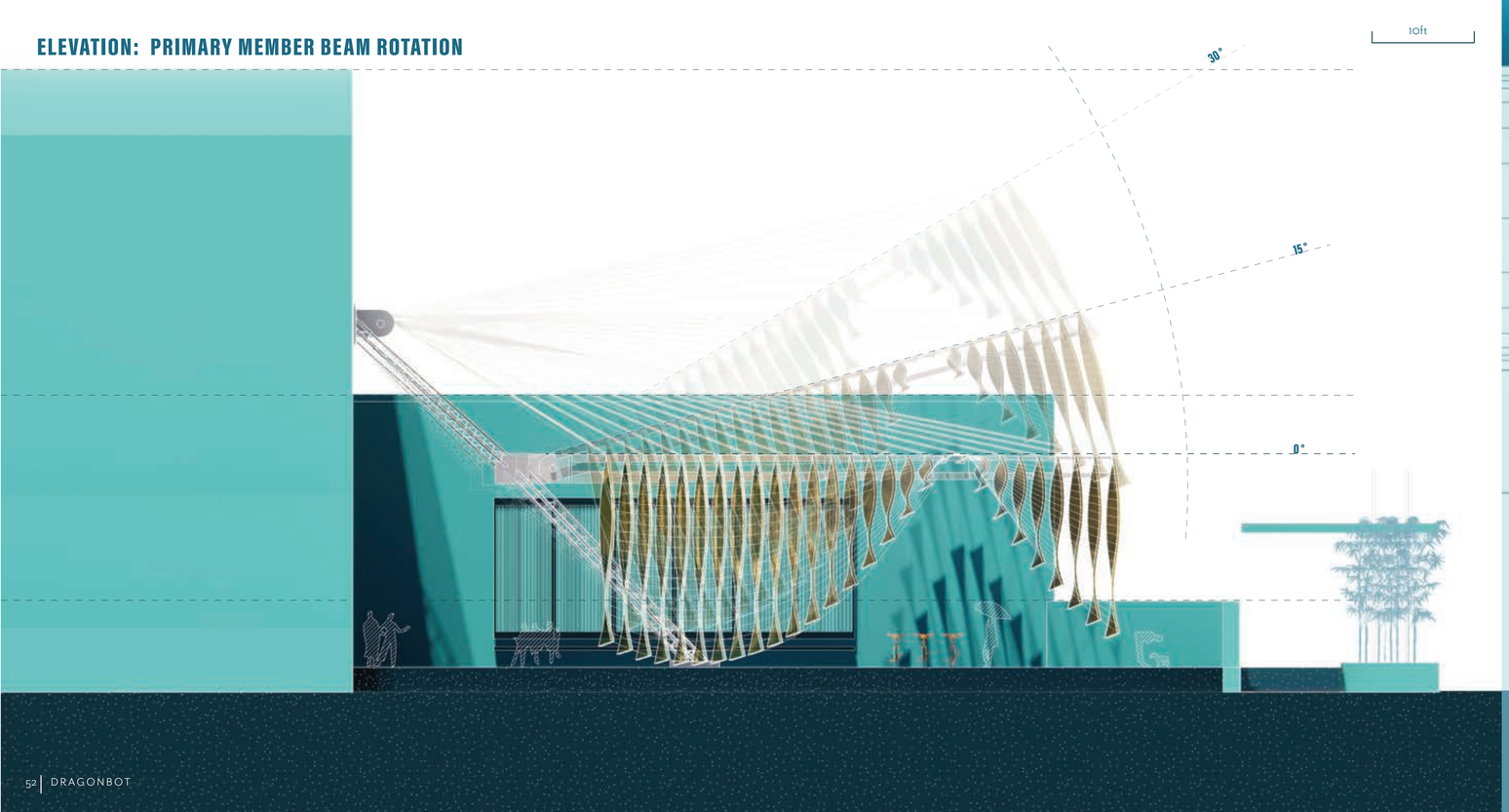
GRASSHOPPER DEFINITION- FLUTTERING SEQUENCE SETTING

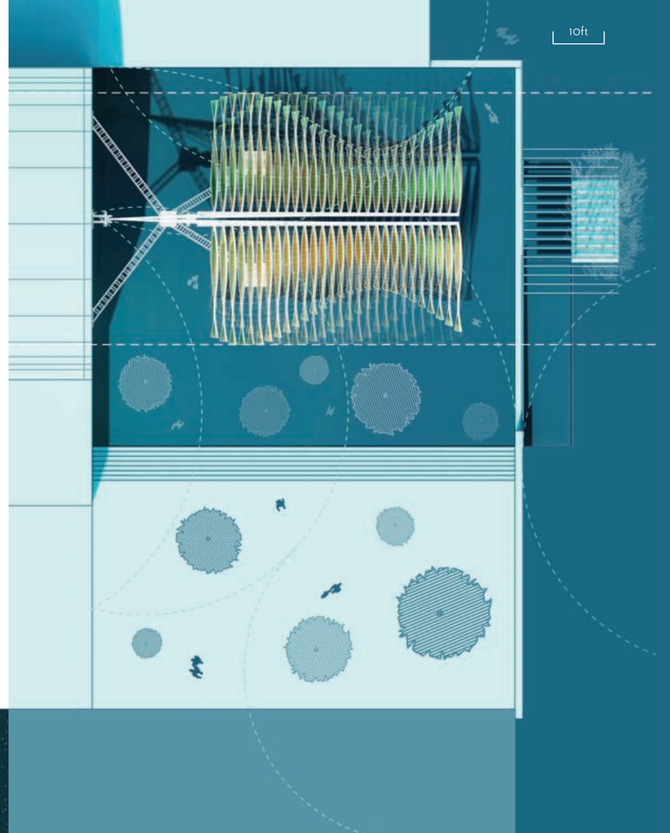


The flutter movement is controlled by several variants including Unit Vector (Direction), Fluttering Domain (the range of movement), Fluttering/ Rotation Pattern (in the designed script, the mathematic expression is fixed as *sine*), and Shift Sequence

The way of fluttering on both sides of the wing is identical

ELEVATION: PRIMARY MEMBER BEAM ROTATION





FORM INTERVENTION

Matt Anderson, Director of Communications at Olson Kundig Architects, said, “Ultimately, truly timeless architecture is inseparable from the place; its authenticity derives from its context, allowing it to remain relevant.” Though highly technical and futuristic, this project intends to reflect a growing desire for more subtle, harmonious interventions with surrounding hardscapes.

The shiny metallic color, the subtleness of mechanical details, and the unique shape of the machine make it a landmark near the Hinman building. As water waves under the impact of the wind, it is constantly dancing with the branches and leaves of the cinnamon trees. From the observation above the courtyard, the curvature of the Dragonbot resonates with the surrounding cinnamon trees. The edge of the Dragonbot maintains its organic form, and the space segregated by the installation and circulation also mimics the shape of the surrounding nature.

EXPERIENTIAL INTIMACY

A PLAY WITH VR BY HOLOLENS

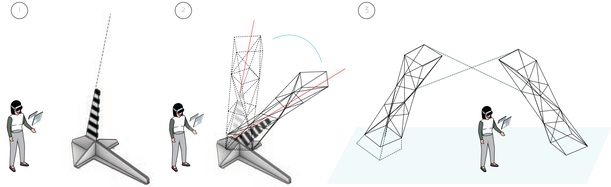
SIMULTANEOUS MANUFACTURE

Course: Advanced Production
Instructor: Keith Kaseman, William S. Reynolds
Location: 723 CherrySt NW, Atlanta, GA
Team: Yining Chen, Moath Rababhah, Jiayong Lu, Sophie Myers, Bhoomika Taneja
Responsibility: Hololens Design Progress+ Manufacture
Spring 2022

MANUFACTURE PROCESS- REBARS CUTTING AND WELDING

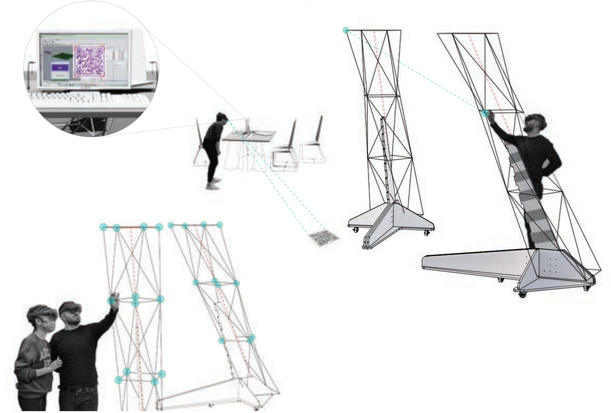
BASIC IDEA- BOOT ROTATION

The boot rotation is the primary motif and key to initiating the design. In other words, this gesture highlights the central axis— the inclination of the structure. During the design progress, the designers put on the holo lenses, rotated the boots, and synchronized the rotation on the laptop. Afterward, the boots are fixed at an angle, and designers can explore different connections between the nodes.



DESIGN PROCESS- DIGITAL FABRICATION

The project aims to integrate various design tools, including laptops, holo lenses, and boots. These three main incentives determine the configuration of the project. The design process demands several team members operate simultaneously. The holo lenses need to be connected to the grasshopper script on the laptop and the QR Code from the boots, so they can accurately capture the hand gestures and locate the two structures and the nodes on them to initiate the design process.



HINMAN GATE- SUMMER

The silver rebar gate sits sturdily in the courtyard,
with the breeze dabbing and birds chirping.
The summer is hot,
and the coldness of the color on the rebars and the holographic plastic sheets cools down the fever.
The sheets are iridescent: they shine brightly,
as the green cinnamon leaves shine under the sun.
Everything is in crazy colors—
the trees, the gate, the shadows,
like a midsummer fantasy in the backyard.

SPATIAL INSTRUMENT

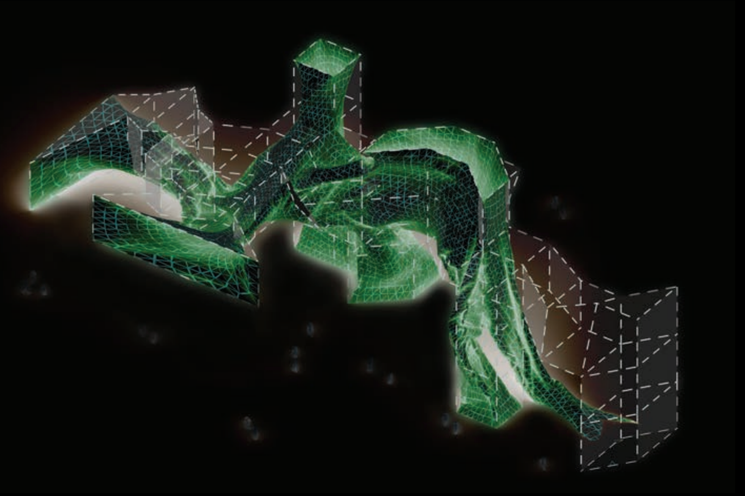
GRASSHOPPER ANIMATION

Course: Media and Modeling III
Instructor: Keith Kaseman
Location: Shanghai, China
Fall 2021

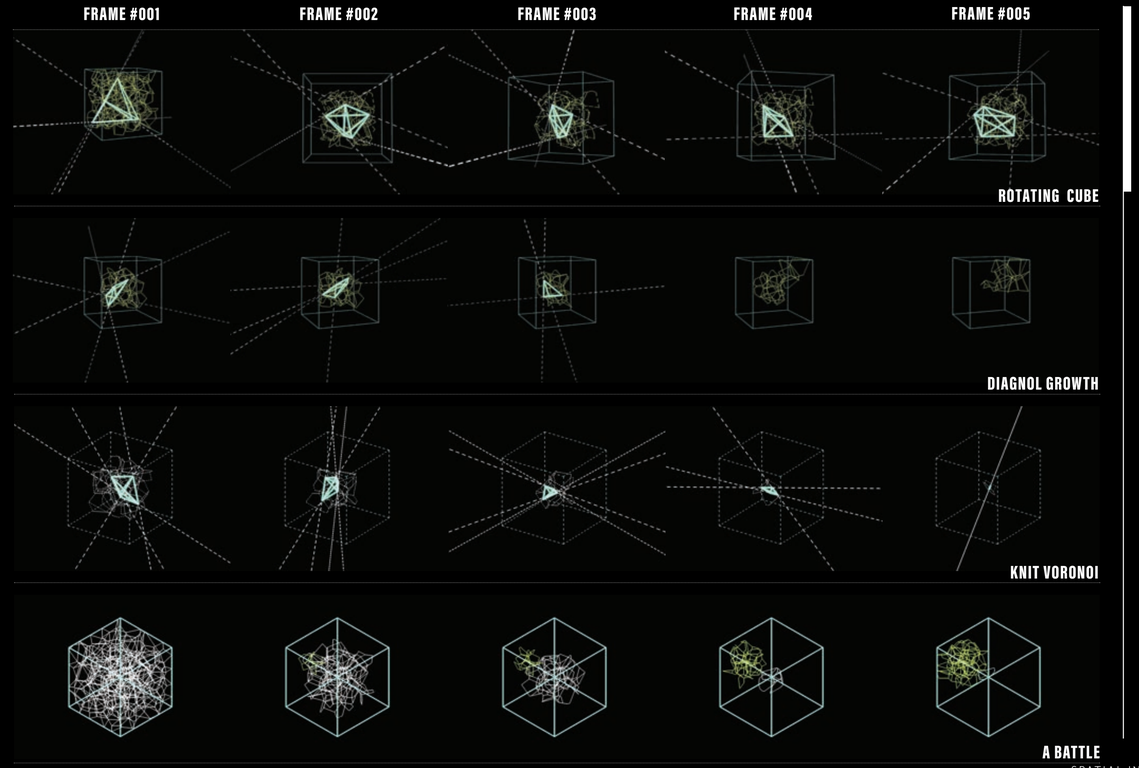
This project encompasses multiple objectives. Firstly, it seeks to delve into the animation plugin within grasshopper, allowing for dynamic and visually engaging design explorations. Secondly, it aims to create a complex Spatial Instrument using grasshopper's flexible capabilities. This involves employing dynamic analytical methods for geometric construction and parametric operations. The digital volume for this instrument is constrained to 25m x 25m x 25m, requiring efficient use of space.

Within this volume, the project aims to develop operable mechanisms that provide a wide range of variable inputs, establish relational hierarchies, facilitate dataflow logic, and showcase behavioral differences. These mechanisms will be achieved through the utilization of specific operations, approaches, and components such as Global Values (Set and Get) and State GateDispatch.

By incorporating these elements, the project seeks to create a design that not only captivates visually but also offers interactive and adaptable features. Through the exploration of animation plugins, intricate spatial instruments, and dynamic analytical approaches, the project strives to push the boundaries of design possibilities within the defined digital volume.



TEST ANIMATION
BREATHING MESH

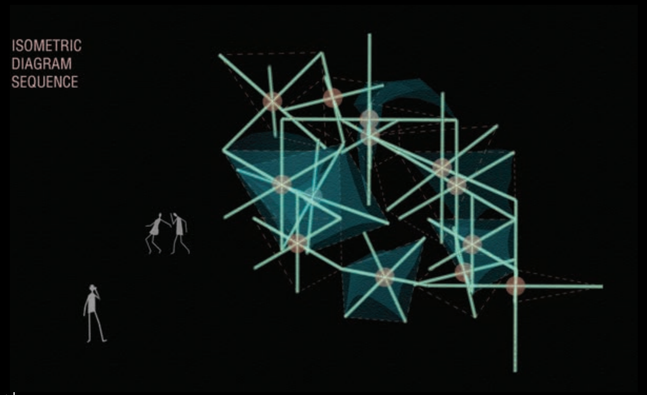


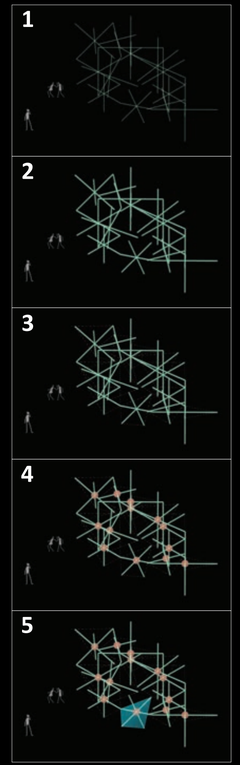
WIND PAVILLION

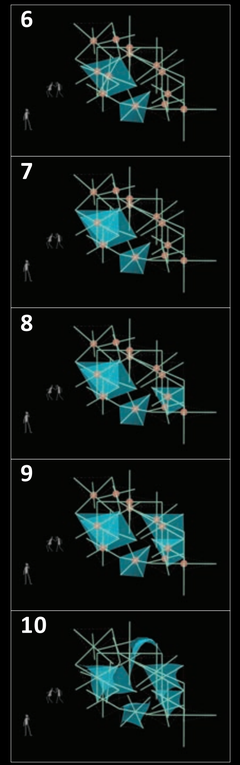
OPERATIONAL SPATIAL SYSTEM

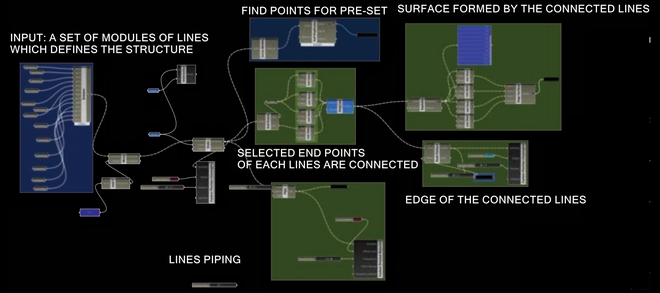
Course: Media and Modeling III
Instructor: Keith Kaseman
Collaborator: Jiayong Lu, Botao Li, Yining Chen (Form Design)
Location: Georgia Institute of Technology
Fall 2021

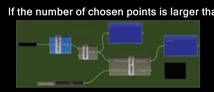
This project tasks to develop, demonstrate, and document an interactive spatial system in real space and at full scale within the volume defined by the Hinman Courtyard. Utilizing Fologram for phones, the collaborative operability of the system uses three synced parameters (live on phones) along with device tracking on more than one phone. The operable spatial systems are free-floating architectural frameworks – spaceframes and canopy structures.



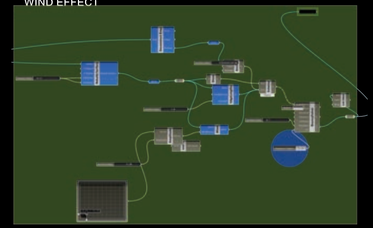




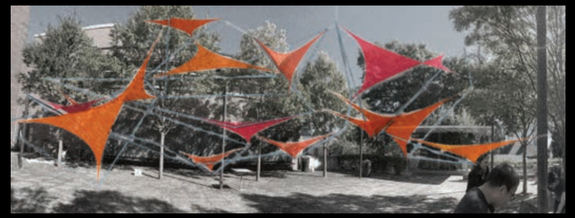




The following constraints and techniques are to be employed:
• Primary curves to be 1 degree; fillets and controlled blend curves
• Global Variables, Stream Gates, State Gates, and Stream Filter operations
• All geometry visible within Fologram on phones for a live demonstration to be synced grasshopper objects (no visible Rhino geometry!), and a reset button



MONTAGES



PARAMETRIC BUILDING SYSTEM

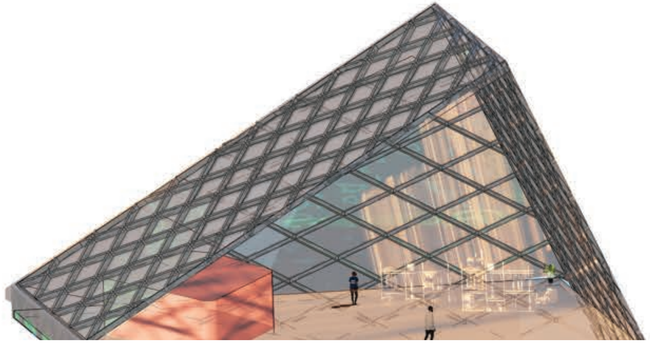
PRADA AOYAMA CASE STUDY

Course: Media and Modeling III
Instructor: James Park
Location: Shanghai, China
Collaborator:
Yining Chen- Elevation Presentation+ Diagrid Analysis
Richard Fridy- Plan Presentation+ Interior Structure
Patricia Rangel- Section Presentation+ Massing Analysis
Spring 2021

For this assignment, students will work in teams. Each team will continue their study on the selected case study building by
1) identifying 3-4 critical building systems.
2) designing and implementing a parametric model for each identified building system.
3) illustrating the work with original diagrams and drawings.
The requirements of the parametric models:
a) 1-3 photograph(s) of the building system with proper citation(s).
b) a simple introductory diagram highlighting the key components, dimensions, and relations.
c) a sample derivation visually describing the generative process in a step-by-step manner.
d) the original design of the building system generated by the parametric model.
e) a set of design variations of the building system generated by the parametric model illustrating the expressiveness (consistency and flexibility) of the parametric model.

Reflection on Diagrids of Prada Tokyo Aoyama

Diagrid is an essential geometry of the building. Comparing our present understanding of the diagrids and the first day we started studying them, our thoughts on the diagrid change on two points: the sizes of the diagrids utilized as units on walls and roofs; the other is the forming process of diagrids.
Our first speculation on these diagrids was that the shape of the diagrids on the walls and roofs was different in shape and size. Therefore when we first drew the diagrids, we treated them as various rhombic forms. There were five facades in total. Therefore we divided them into one diagrid unit for the walls and five others for different roofs. However, when we started to develop our diagrid system using the projection method, we realized there was only one diagrid unit for the whole cladding system. The diagrids on the walls are perpendicularly projected, whereas the projection on tilted planes causes the distorted diagrids on roofs.
For our systems of diagrids, we used points and lines as basic units of our diagrids because we initially intended to treat the size of the diagrids as a parameter. With individual lines and points, we could easily change the sizes and shapes of the diagrids. We discovered that the diagrid could vary by following or breaking the original rule. The height and width could go by the ratio 2: 3.2, and all sides remain equal; or the regular proportion could be changed to another ratio; or the sides of the diagrids could be unequal to each other, which transforms the diagrids into an irregular net shape. However, it turned out that we used the original diagrid system and adapted it into different massings. As a result, the necessity of using points and lines as starting input was questioned. We wondered if there is a better way to begin the formation of the diagrid, for instance, starting with a single rhomb or an isosceles triangle. Further experimentation could be done by creating different geometries for the diagrid system.



Prada Aoyama Tokyo

Herzog & de Meuron

Structure Analysis

SEGMENT

Each facade of the building is split into nearly-even panels around 3250mm wide. These segments inform the entire floor plan.

VERTICAL CHASES

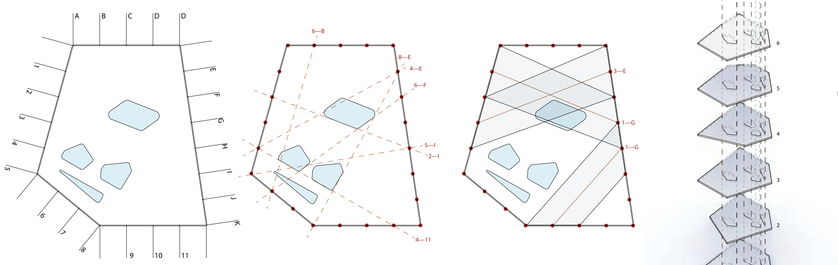
Projection lines traced between the segments described before frame the forms of the vertical chases that extend through the building.

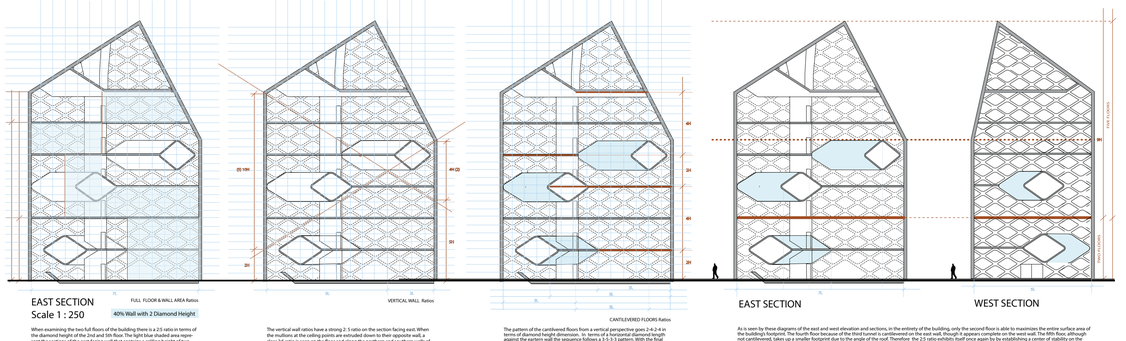
EXTRUDED DIAMONDS

Diamond extrusions produce enclosed spaces on three floors of the building. These extrusions follow a similar logic, with one side touching a seam in the facade and the other reaching the middle of the opposite facade.

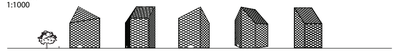
FLOOR PLATES

This 3D model and the correlating plans demonstrate reveals in the floor plates that relate to the edges of the diamond extrusions.

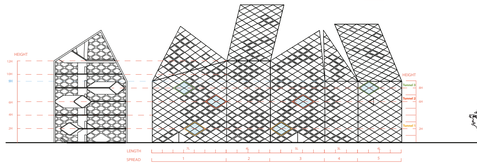




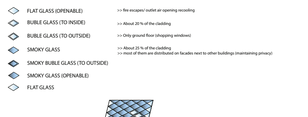
ELEVATION
1:1000

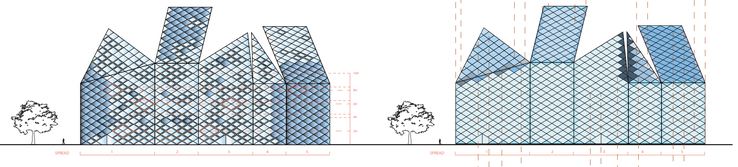


DIMENSION ANALYSIS ON FACADES AND FLOOR HEIGHTS
1:400



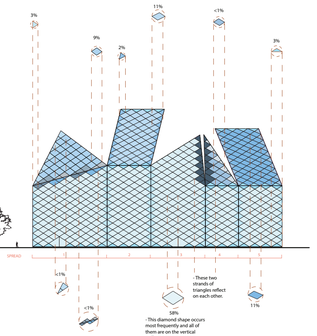
GLASS TYPE ANALYSIS
1:400





GEOMETRY ANALYSIS
1:400

This diagram estimates the proportion of each type of geometry on exterior wall of the building. Most of the glass panels are rhombic, on the edge of each spread, the rhombics are cut into different shapes of triangles.

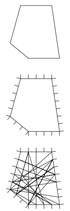


- The centroid of Tunnel 1 is at the floor height 2H; the centroid of Tunnel 2 is at the floor height 6H; the centroid of Tunnel 3 is at the floor height 8H. The distance ratio between the ground level and the centroid of these three tunnels are 2:4:2.
- Both Tunnel 1 and 2 begin from SPREAD 1 and ends at SPREAD 3, and both the distance from the beginning centroid to the end centroid of these two tunnels are 8L.
- Tunnel 3, unlike Tunnel 1 or 2, starts from SPREAD 1 and ends at Spread 5 which is adjacent to Spead 1 on the building, on the spread the distance from the beginning centroid to the end of the centroid is 17 L.
- According to the SPREAD, Each tunnel has a point hitting a corner of the building, Tunnel 1 hits the corner of the North and West facade (SPREAD 2&3), Tunnel 2 hits the corner of the East and North facade (SPREAD 1&2), Tunnel 3 hits the South-West and South facade (SPREAD 4&5).

- From the observation of the glass types on the surface where all tunnels begin and end, most of the glasses are buble glass (to outside), therefore the visitors who traverse through the tunnel could see the outside world.
- Most glass panels on SPREAD 5 and partial glass panels on SPREAD 1 are smoky glasses, those are the facades for where the staircases locate inside the building.
- Most of the openable glasses are on SPREAD 1, 2 and 3. The ones on the vertical walls are fire escapes. All the fire escapes locate on the floors with height of 4H, 6H, 8H and 10H, the distance ratio between these floors are 2: 2: 2.

A

SLABS

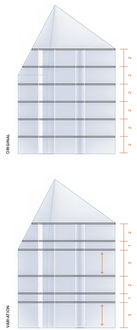


Inputs:

—Massing Surfaces
—Diagrid Module
Dimensions

Parametric Overview:

The system flows a series of horizontal planes into the simplified 3D massing diagram. The planes are designed to be able to be shifted in increments that are equal to the height of the diagrid module, allowing the user to develop different spatial relationships on each level of the building. The simplified 3D massing diagram trims each plane, and the planes are extruded downward.



B

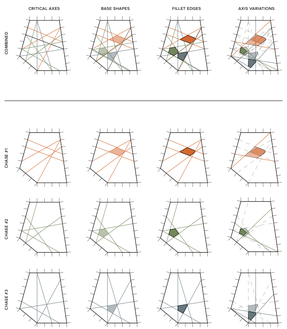
VERTICAL CHASES

Inputs:

—Massing Outline at Ground Plane
—Critical Axes between Diagrid Module Nodes

Parametric Overview:

The system derives complex 3D shapes from projection lines that extend across the plan of the building between structural diagrid intersections (suggesting locations of supporting beams inside of the floor slabs). The module creates 5-sided shapes from sets of five intersecting axes, and these shapes are then extruded to the height of the building and filleted at corners. Repositioning of axes to different nodes produce new/different shapes, which are extruded into different vertical chases.



C

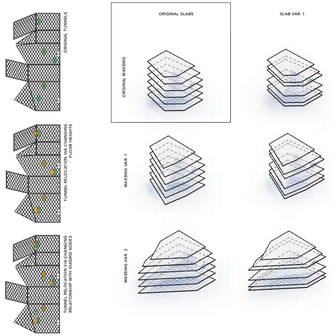
HORIZONTAL TUNNELS

Inputs:

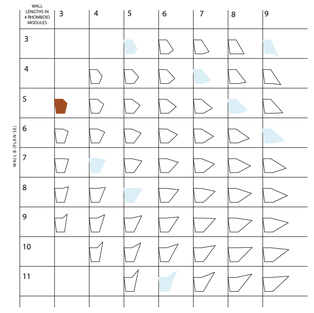
—Diagrid Lines
—Edges of Vertical Chases (for alignment)

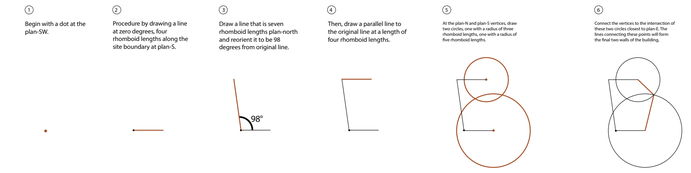
Parametric Overview:

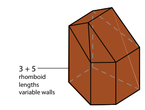
This system, still in progress, creates horizontal tunnels that function similarly to the vertical chases. Instead of referencing the structural diagrid nodes and producing extrudable shapes through projection lines, the tunnels are extruded from the steel diagrid itself. Tunnels are varied by assigning differing start and end panels. Floor slabs are, in turn, trimmed by the intersections produced by these tunnels.

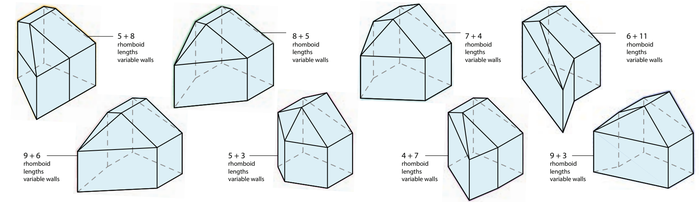


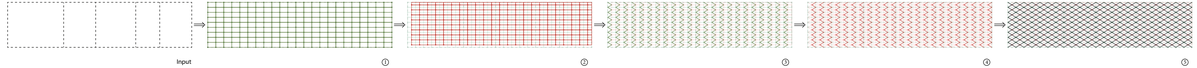
The base of the massing is the floor plan of this building. And the floor plan strategically begins with a dot on the ground that sits in the corner of an alley and a sidewalk in Tokyo, Japan. From that point, architects Herzog & de Meuron make a deliberate move that slightly shifts two equal-distant parallel lines. The vertex of those lines then determine the length and angle of the corresponding walls that became the main entrance and plaza of the Prada Aoyama building. The second most important piece of the massing is the roof line that connects all the vertex heights to one of its two ends.











Input: Unfolded elevation with folding edges

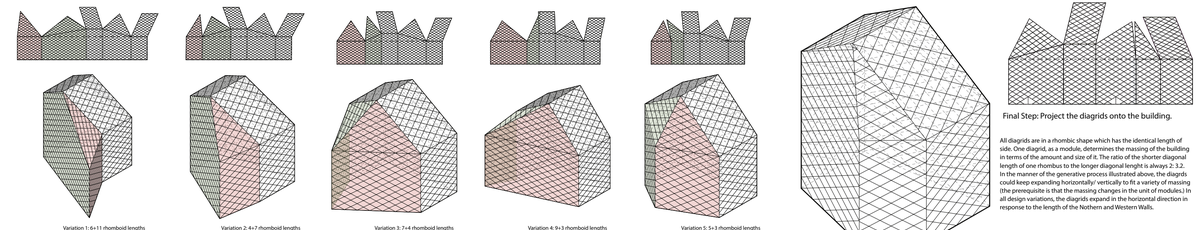
Step 1: Make the the first triangular set of points, set the gap length on the horizontal axis as 3200mm, and the gap length on the vertical axis as 2750mm, The number of horizontal intervals is 23, the number of vertical in-tervals is 9.

Step 2: Create the second set of points as Step 1. Move them 1600mm to the right, then 1375mm up.

Step 3: Connect the first set of points with the second in an one-to-two relationship.

Step 4: Connect the second set of points with the first in an one-to-two relationship.

Step 5: Turn off the points and get only the diagrids.



Design Variations

Final Step: Project the diagrids onto the building.

All diagrids are in a rhombic shape which has the identical length of side. One diagrid, as a module, determines the massing of the building in terms of the amount and size of it. The ratio of the shorter diagonal length of one rhombus to the longer diagonal lenght is always 2: 3.2. In the manner of the generative process illustrated above, the diagrids could keep expanding horizontally/ vertically to fit a variety of massing (the prerequisite is that the massing changes in the unit of modules.) In all design variations, the diagrids expand in the horizontal direction in response to the length of the Nothern and Western Walls.

Points ⟹ Lines ⟹ Diagrids

SECONDARY SYSTEM- DIAGRID