

YINGYAO LU PORTFOLIO

yingyao@umich.edu

(734) 8347378

Selected Works

2020-2024

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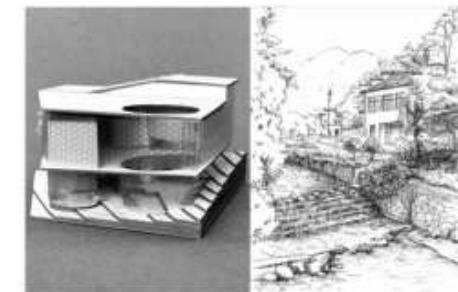
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PROFESSIONAL WORK

01

ECOSILENT URBAN PATCHWORK

Mix-Used Housing Design, 2024

Academic Studio (Group Work)

University of Michigan

Site: Downtown, Detroit

Instructor: Lars Gräbner, Christina Hansen

Design Software: Revit(Buildings), Rhino(Landscape),
Adobe Suite, Lumion

EcoSilent Urban Patchwork is a community-driven residential project in downtown Detroit.

Urban Integration & Greenway Connectivity

- Transforms a dead-end street into a vibrant Greenway, reconnecting downtown to the waterfront.
- The Greenway weaves through the site, creating active communal spaces and enhancing pedestrian engagement.
- Two residential towers act as landmarks, transitioning into lower-rise areas to respect the neighborhood scale.

Human-Centered Living & Social Interaction

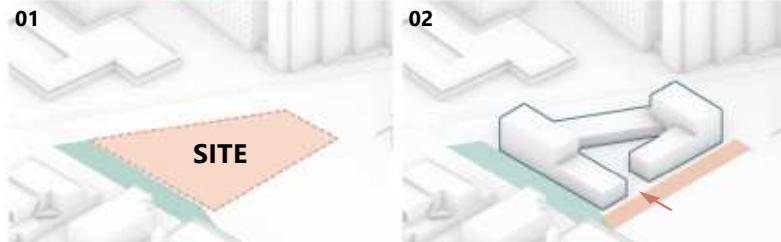
- Diverse unit typologies (from studios to townhouses) accommodate different lifestyles and backgrounds, fostering a sense of belonging.
- Communal terraces, shared spaces, and wide corridors encourage social engagement.
- Setbacks on commercial floors activate the Greenway with retail, cafés, a gym, and bicycle parking.

Sustainable & Eco-Friendly Design

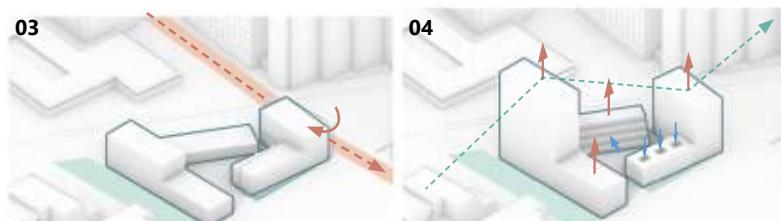
- Hybrid concrete and CLT structure minimizes environmental impact.
- Wood shutter facades enhance shading and energy efficiency.
- Green roofs, solar panels, and community farms contribute to long-term sustainability.



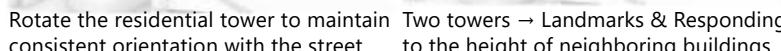
SITE & FORM STRATEGY



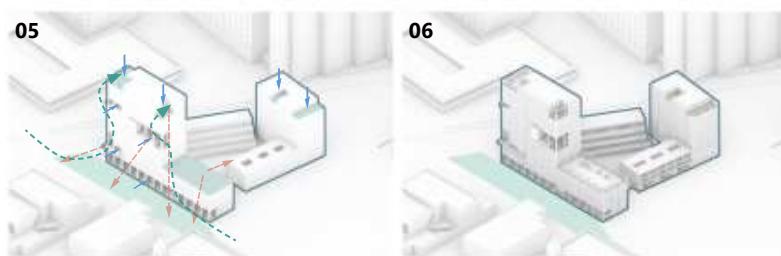
604 Abbott St, Detroit, MI 48226



Define the boundaries of the site.



Rotate the residential tower to maintain consistent orientation with the street.



Two towers → Landmarks & Responding to the height of neighboring buildings.

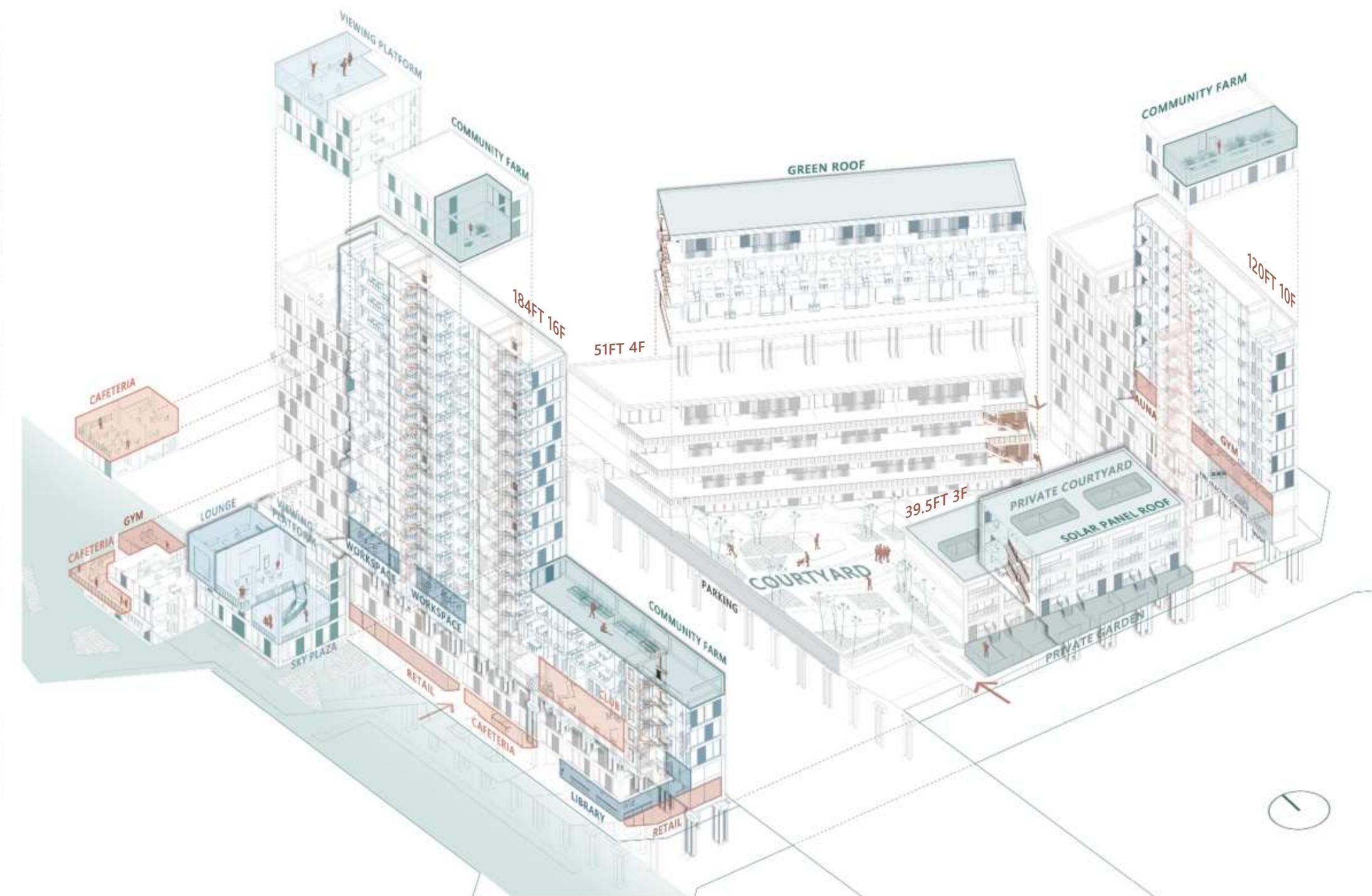
Locate collective space. Push back and Interact with greenway.

2 Towers+Terrace+Townhouse

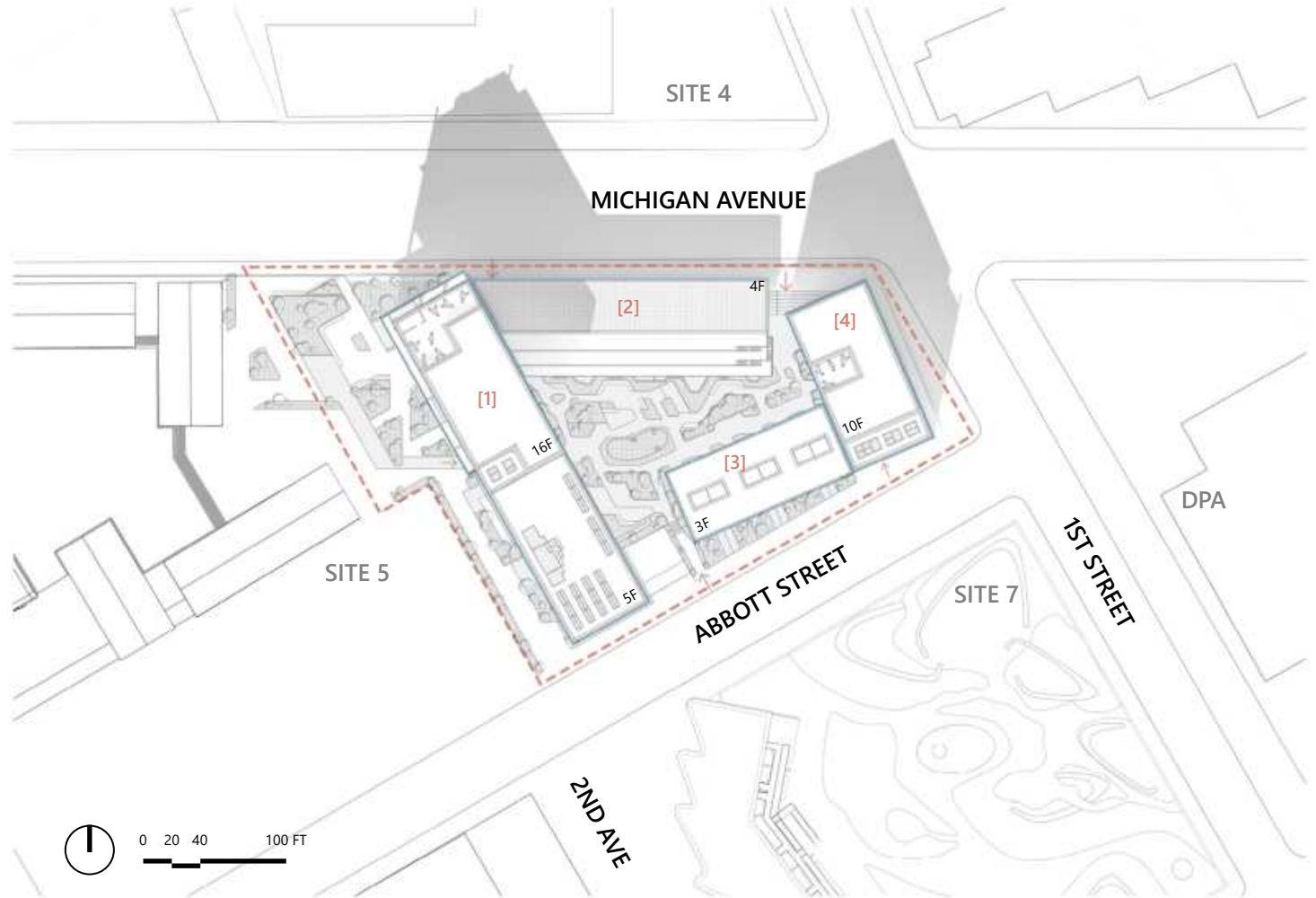
PROGRAMS

Site Area: 78,060 sq ft (1.79 acres)
Total Gross Floor Area (GFA): 343,565 sq ft
FAR: 4.4
Building Footprint: 64,445 sq ft

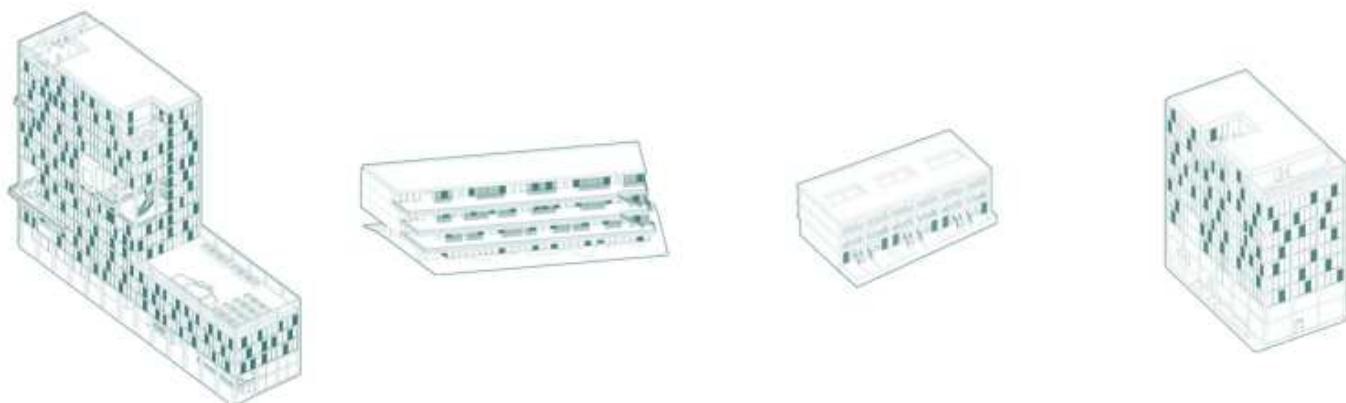
Lot Coverage Percentage: 82.56%
Building Height: 184 ft
Unit Count: 256
Parking Space: 47



SITE PLAN



BUILDING TOPOLOGY



[1] TOWER A

[2] TERRACE

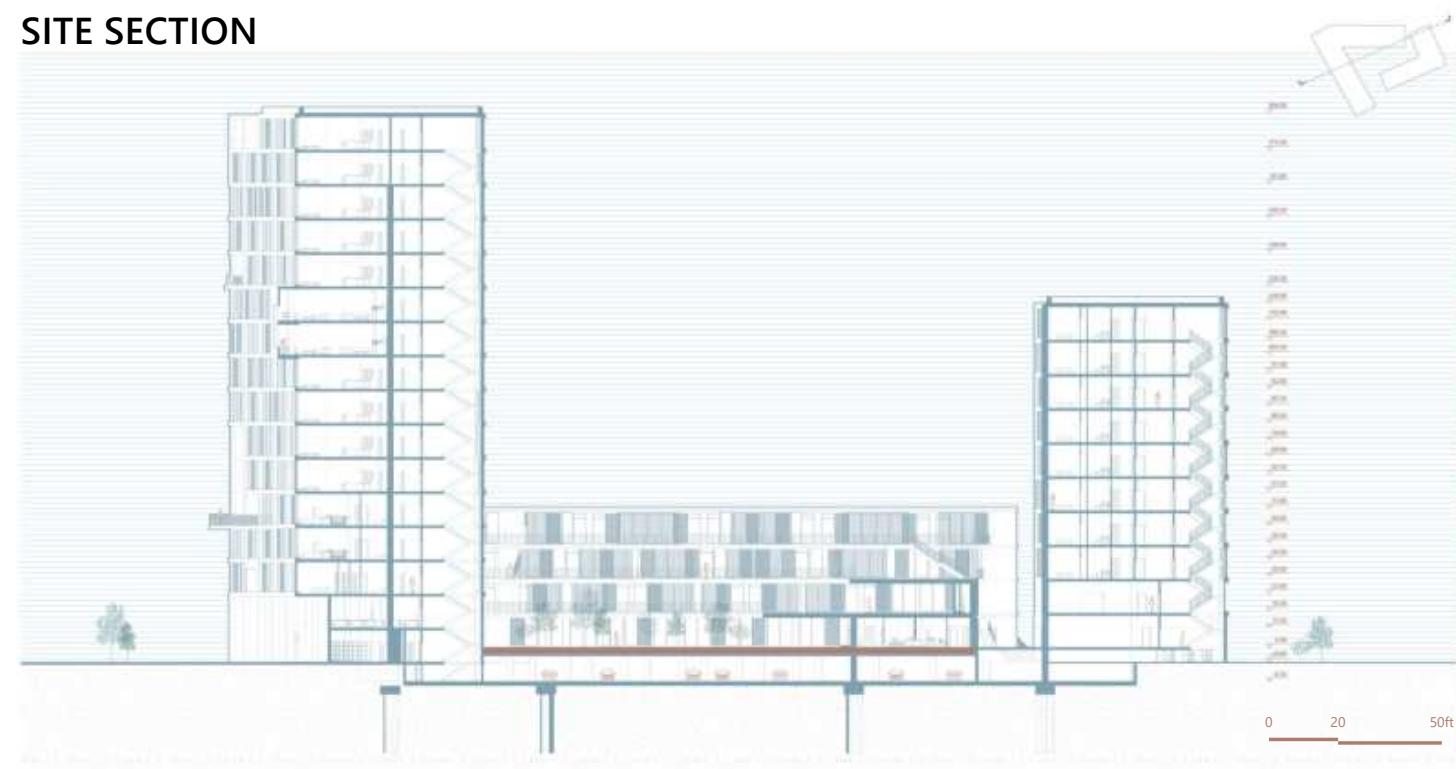
[3] TOWNHOUSE

[4] TOWER B

VIEW FROM ABBOTT STREET

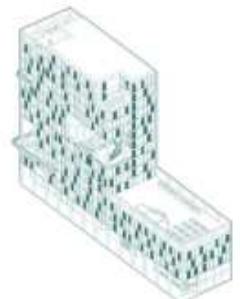


SITE SECTION

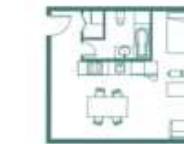
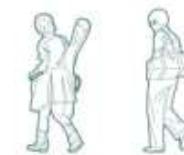


UNIT TYPOLOGY

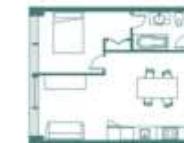
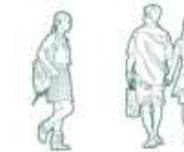
TOWER A+B



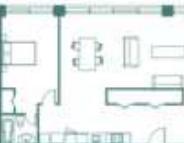
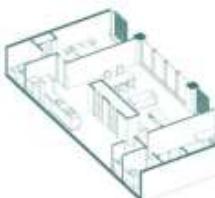
STUDIO



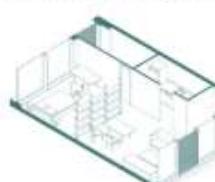
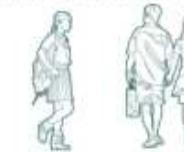
1B1B



2B2B



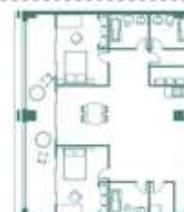
1B1B



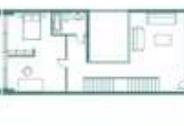
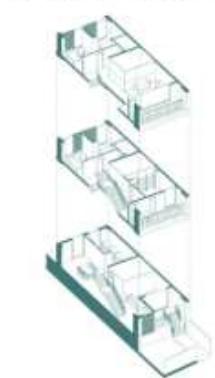
TERRACE



3B3B



TOWNHOUSE

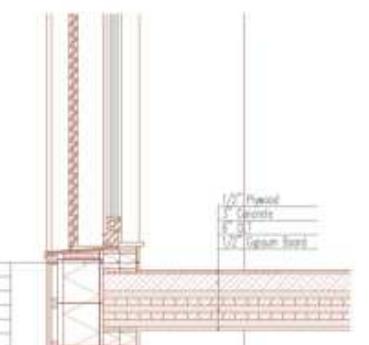
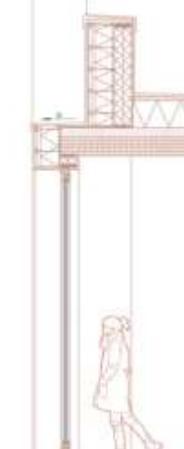
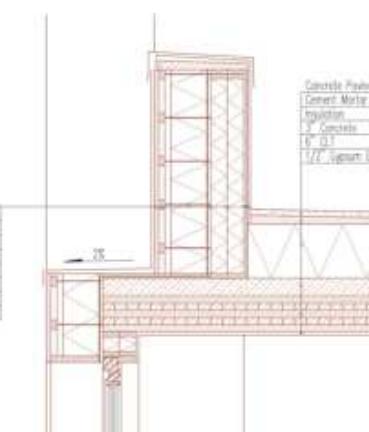
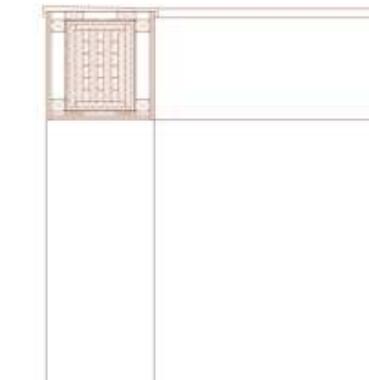


TOWNHOUSE



Area: 3000 sf
User: Larger Families/ Multi-Generations

TOWER 1 FAÇADE DETAILED SECTION



1/8" Plated
3/16" Permalite Insulation
3/8" Sheathing
Weather Barrier
8" Rebar Wall Insulation
T-Baffles
1/4" Wood Decking

1/8" Plated
3/16" Permalite Insulation
3/8" Sheathing
Weather Barrier
8" Rebar Wall Insulation
T-Baffles
1/4" Wood Decking

Post Mortar
Weather Barrier
3/8" Sheathing
3 1/2" Thermal Insulation
3/8" Sheathing
Weather Barrier
8" Rebar Wall Insulation
T-Baffles
1/4" Wood Decking

3/8"=1'

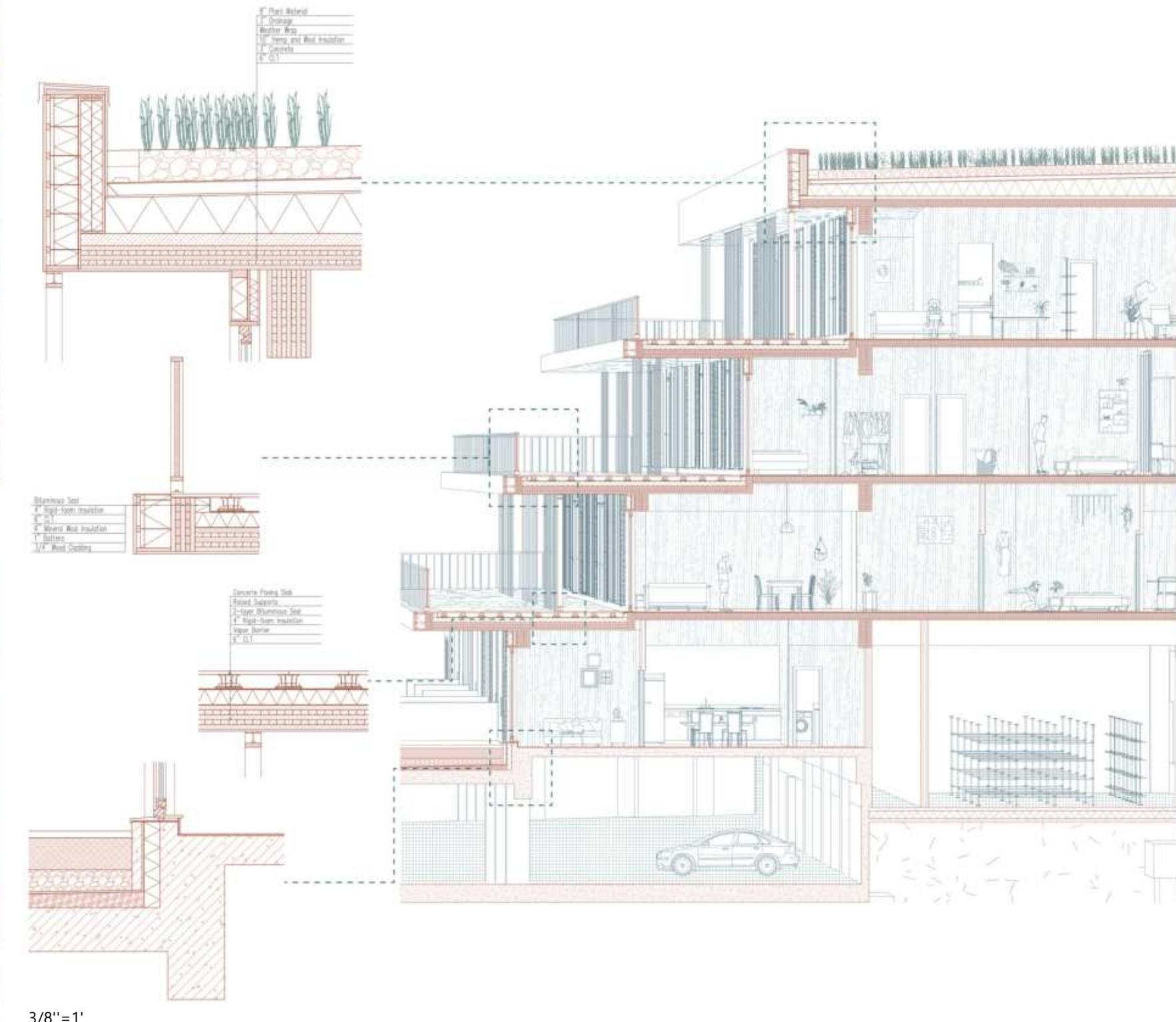
3/16"=1'



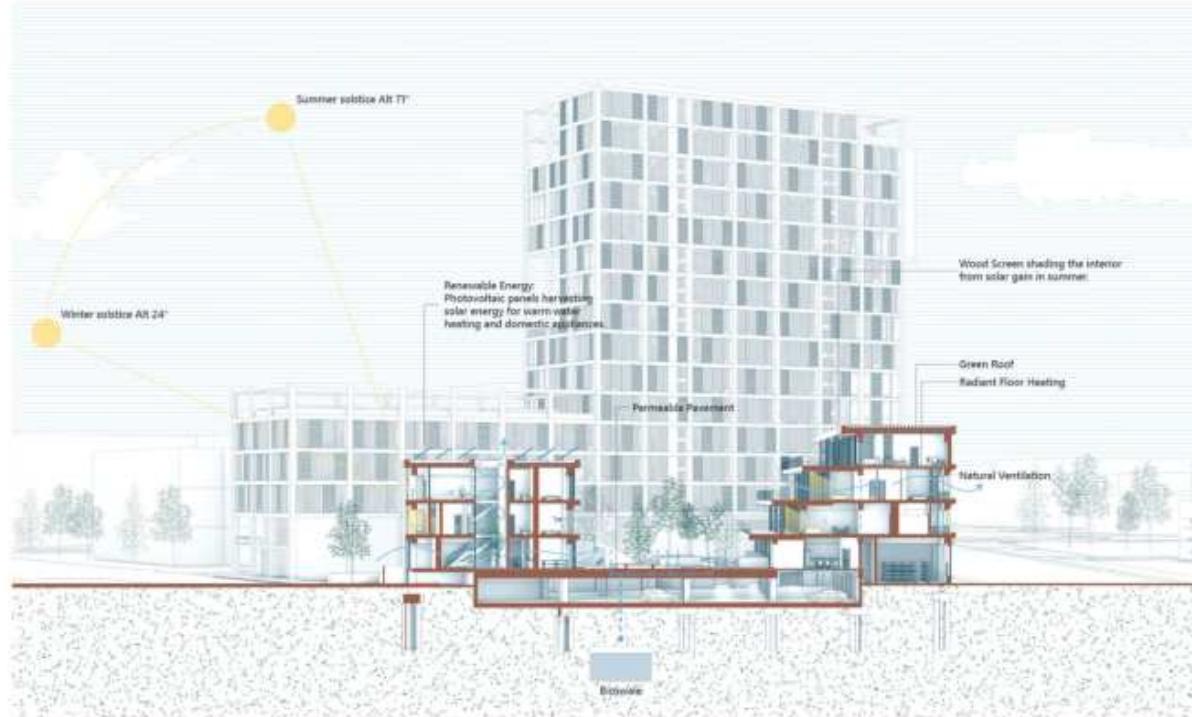
VIEW FROM COURTYARD



TERRACE FACADE DETAILED SECTION



ENVIRONMENTAL SYSTEM

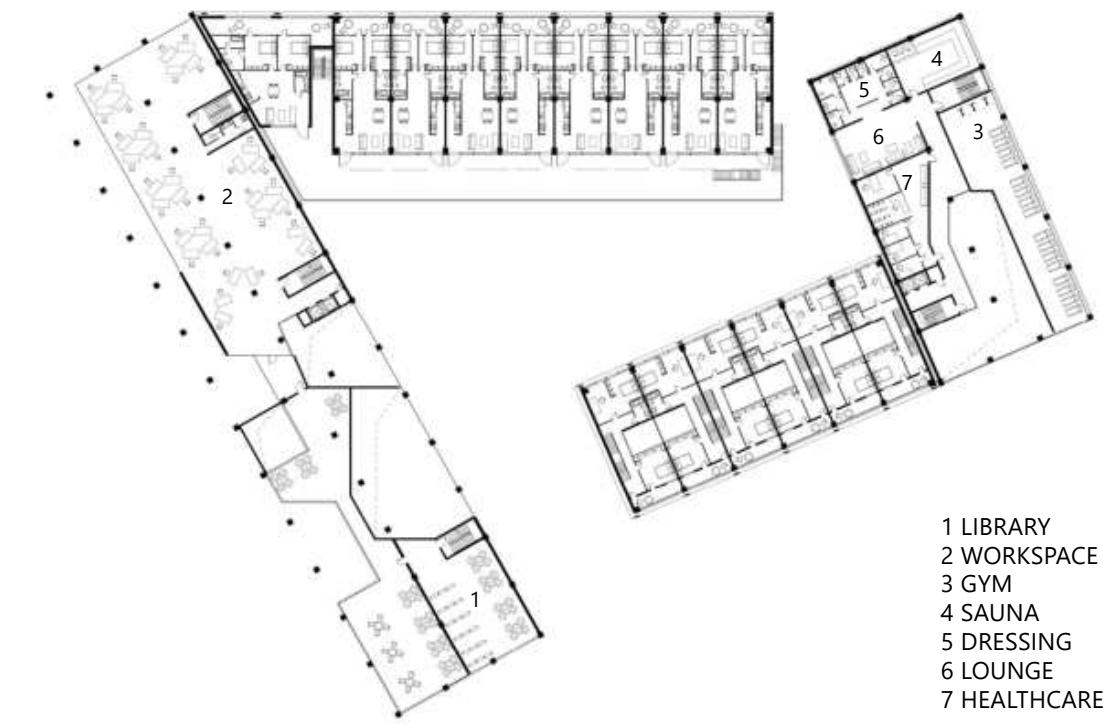


FLOOR PLAN

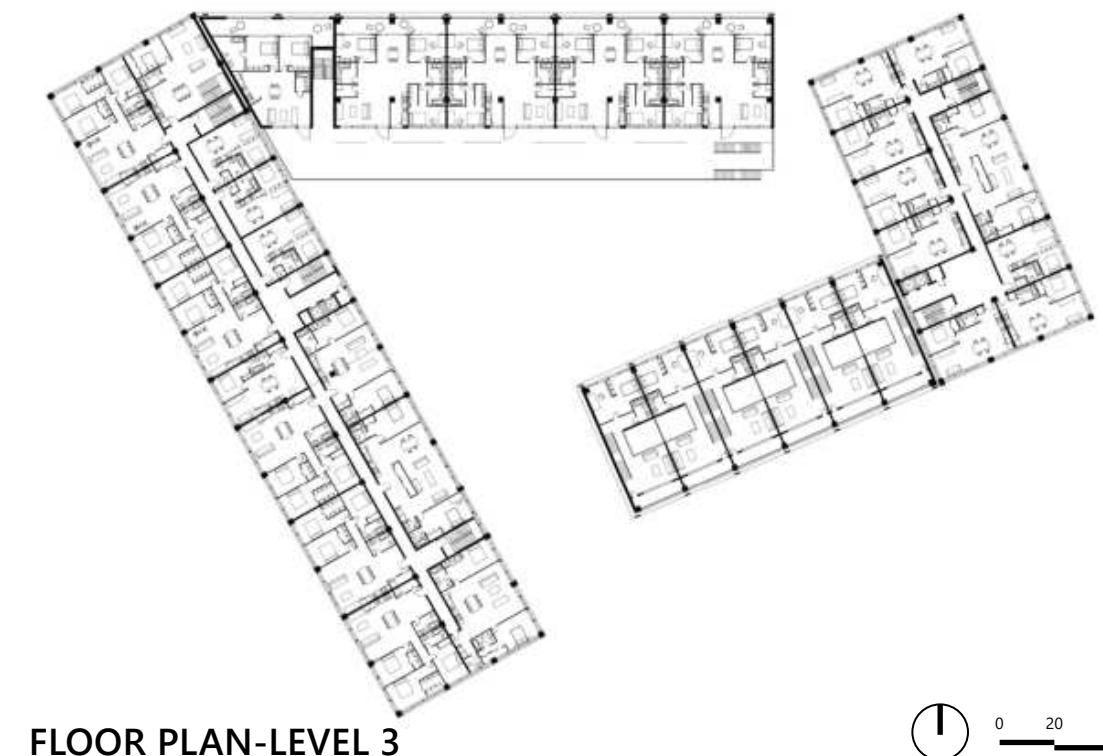
MICHIGAN AVENUE



FLOOR PLAN-GROUND FLOOR

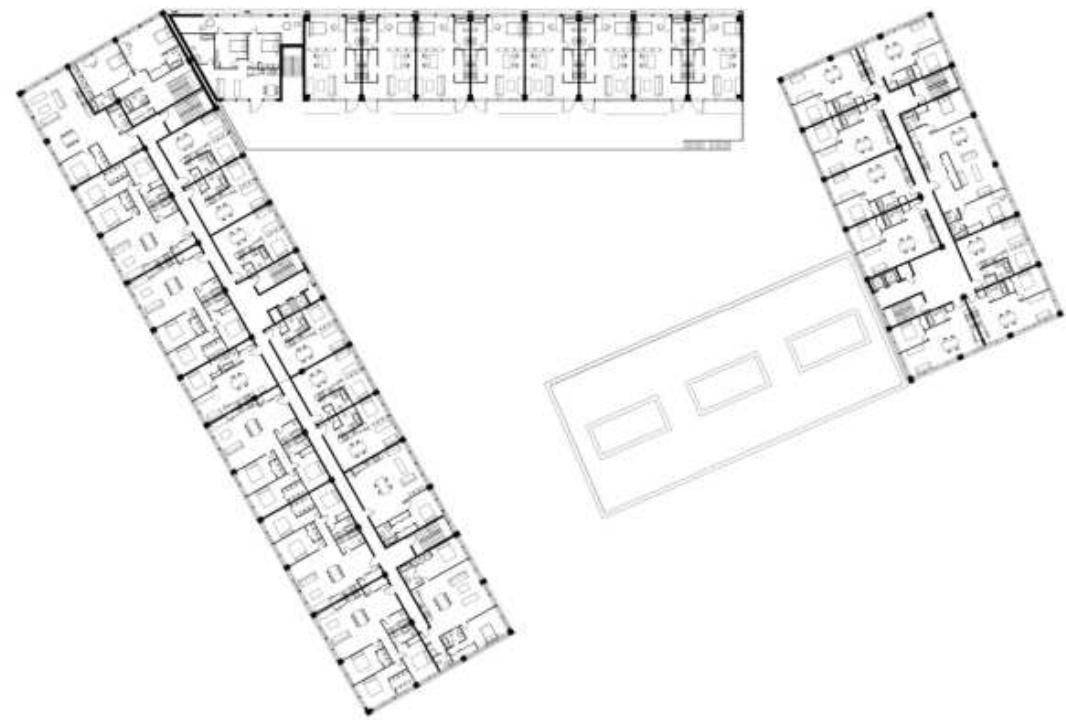


FLOOR PLAN-LEVEL 2

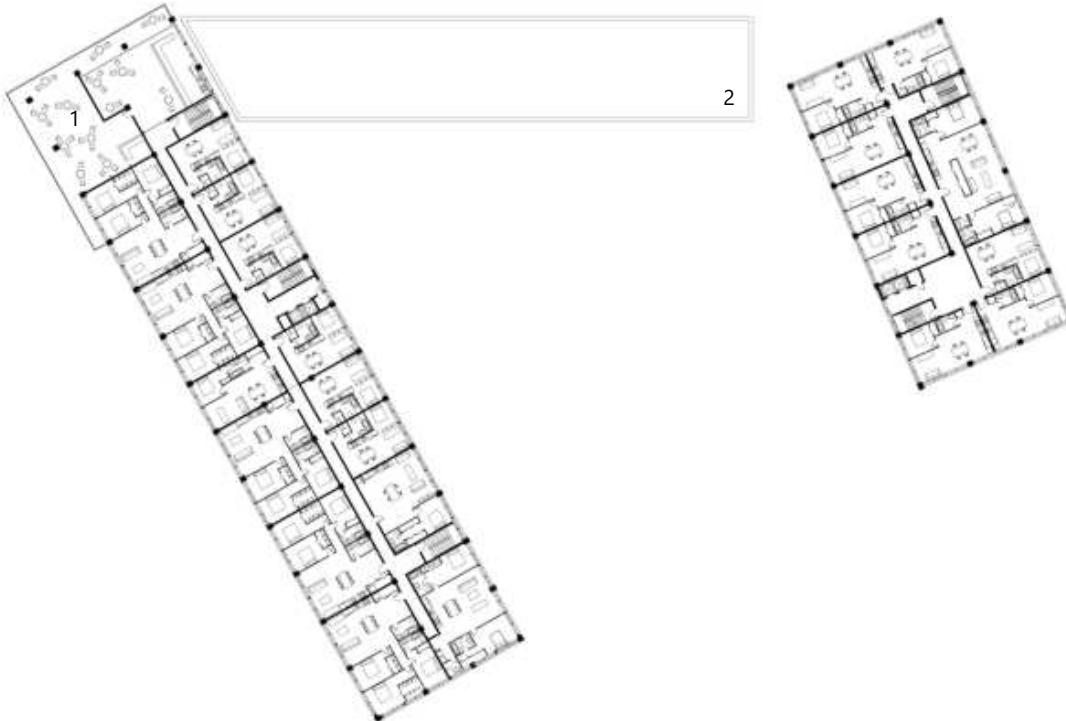


FLOOR PLAN-LEVEL 3

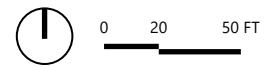
0 20 50 FT



FLOOR PLAN-LEVEL 4



FLOOR PLAN-LEVEL 5



GREENWAY VIEW FROM BUILDING ENTRANCE



VIEW FROM TERRACE



02

BOYNE FALLS SKI RESORT

High Performance Building Design, 2024

Elective Course

University of Michigan

Site: Boyne Falls, Michigan

Instructor: Lars Junghans

Design Software: Revit, Grasshopper(Ladybug),
AutoCAD, Adobe Suite, Lumion



This project explores the integration of sustainable materials and energy-efficient strategies to create a high-performance ski hotel in Boyne Falls, North Michigan (Climate Zone 6A).

Sustainable & Energy-Efficient Solutions

- Hemp wool insulation for high thermal efficiency and reduced embodied carbon.
- South-facing angled balconies to maximize sunlight exposure and thermal comfort.
- CLT + concrete core on the ground floor for stability, with lightweight stick-frame construction on upper floors to reduce structural load and material use.

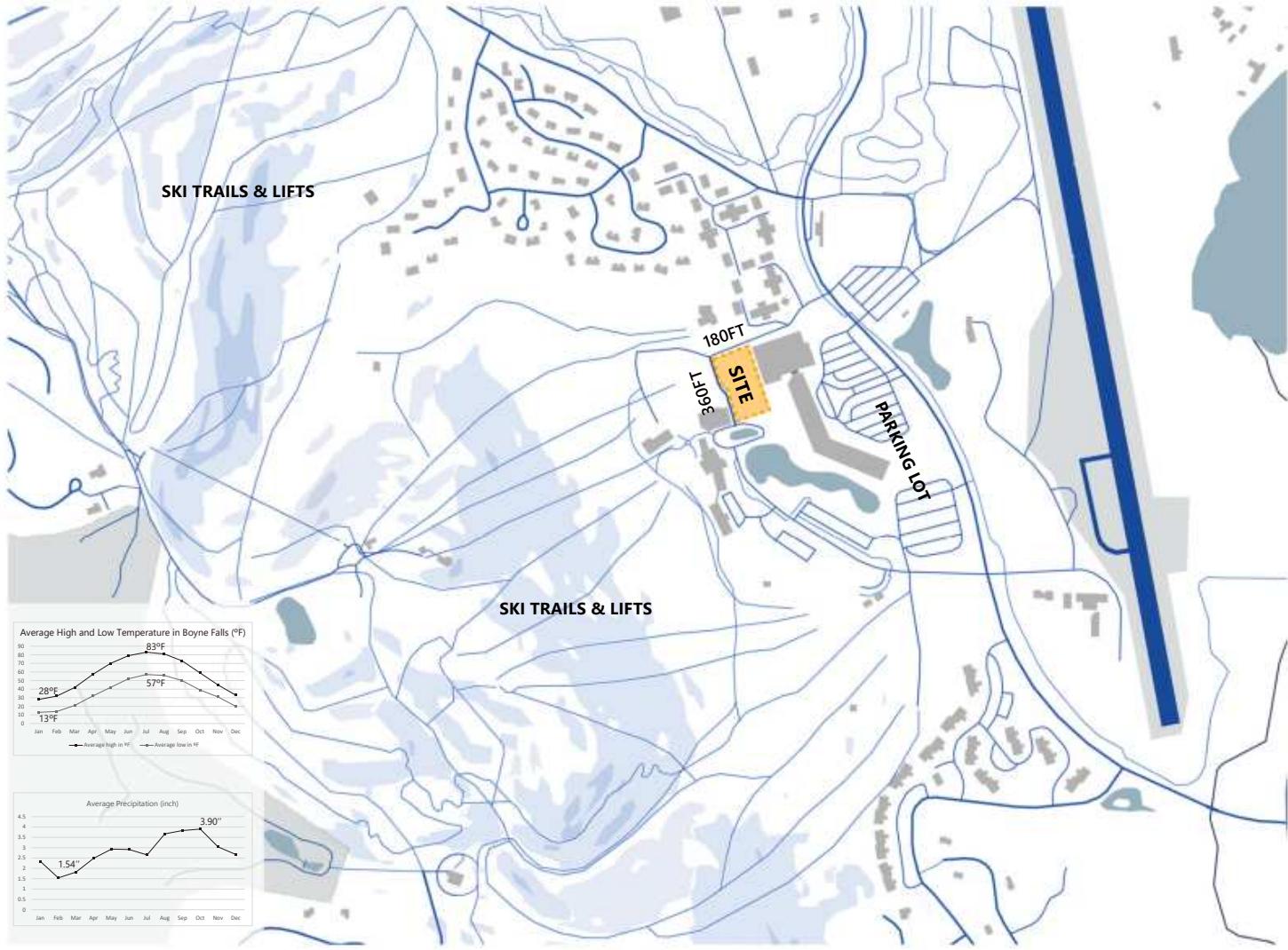
Passive Design & Energy Systems

- PV panels & high-efficiency HVAC systems minimize energy consumption.
- Air-to-water VRF heat pumps & mechanical ventilation ensure optimal indoor climate control across all seasons.

Integration & User Experience

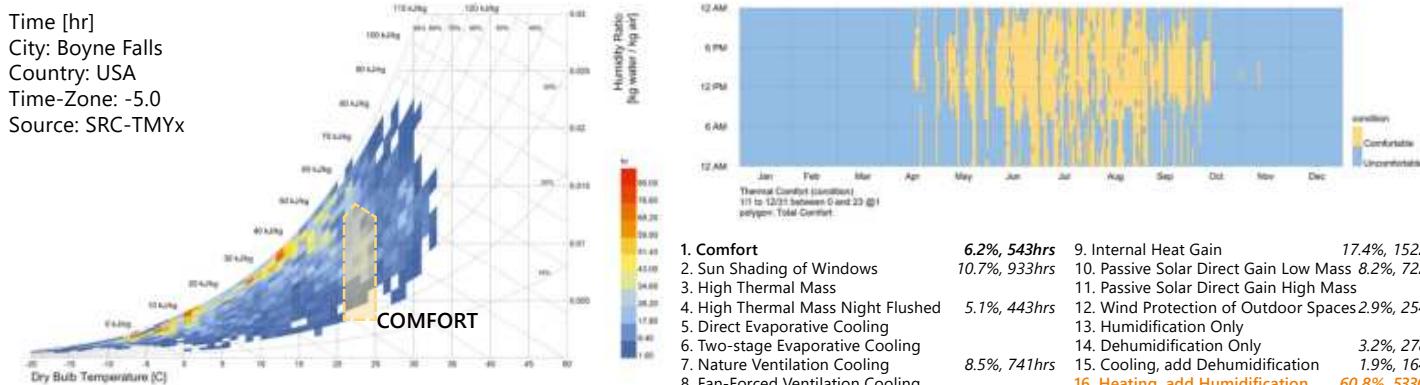
- Public terraces and communal spaces enhance guest experience and strengthen indoor-outdoor connectivity.
- Wood cladding blends the hotel into its natural surroundings.

SITE LOCATION



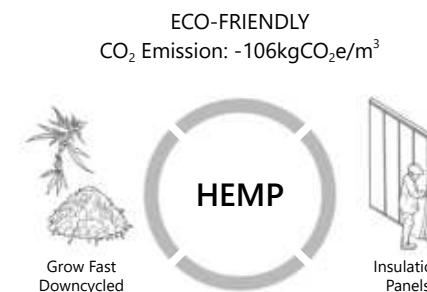
PSYCHROMETRIC CHART

Time [hr]
City: Boyne Falls
Country: USA
Time-Zone: -5.0
Source: SRC-TMYx



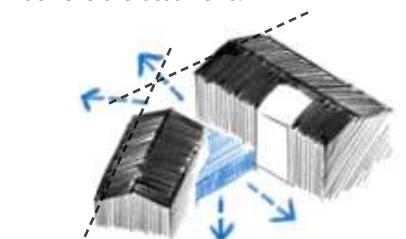
CLIMATE ZONE: 6A

Design Strategies in
Psychometric Chart:
HEATING 60.8%



Hemp Wool R-Value: 3.69/in
HIGH THERMAL RESISTANCE

Determine the building's orientation based
on the slope and ski trails' direction to
achieve the best views.



Angled balconies maximize sunlight
exposure.

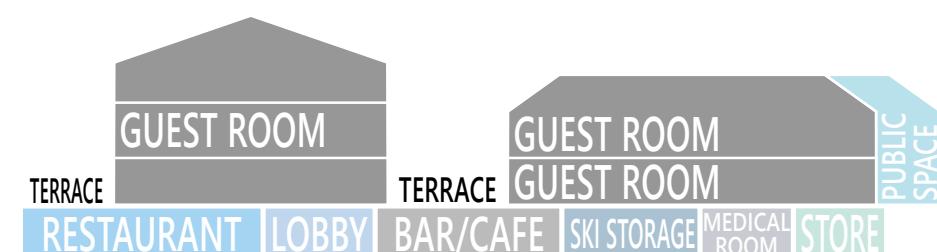


The winter garden offers a year-round space
to enjoy natural light and greenery.

SITE AXON

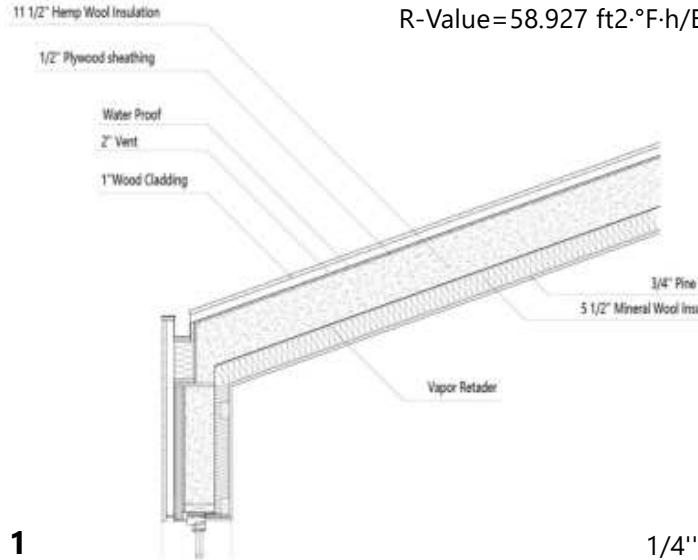


PROGRAMS



ROOF CONSTRUCTION DETAIL

R-Value=58.927 ft²·°F·h/BTU



1
PERSPECTIVE SECTION



WALL CONSTRUCTION DETAIL

R-Value=45.235 ft²·°F·h/BTU

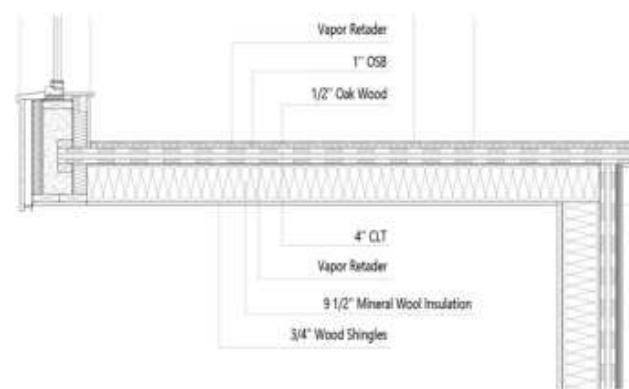


2

1/4"=1'

FLOOR CONSTRUCTION DETAIL

R-Value=41.567 ft²·°F·h/BTU



3

1/4"=1'

ACTIVE SYSTEMS

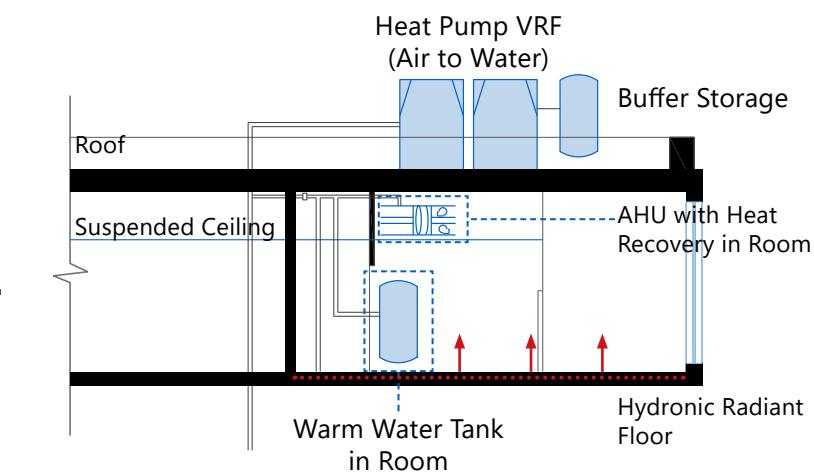
AIR HANDLING

Mech. Vent (Energy Ex.)

HEATING/COOLING UNIT

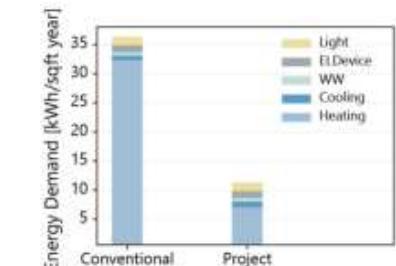
Heat Pump (air-water) VRF

Air to Water VRF

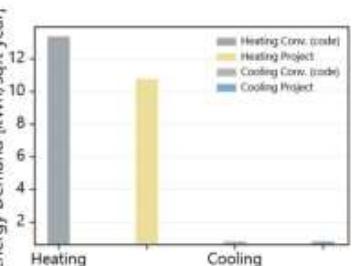


ENERGY DEMAND & LCA RESULT

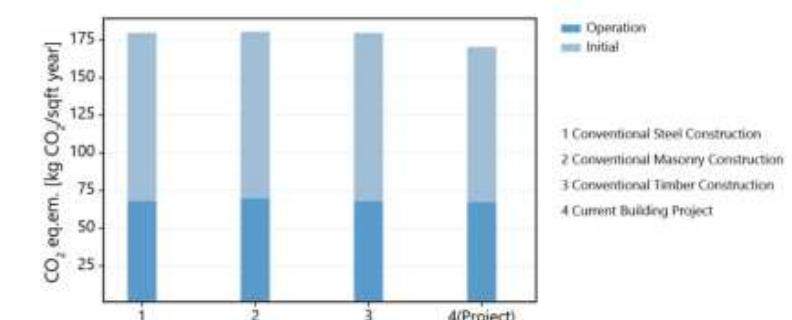
PRIMARY ENERGY DEMAND

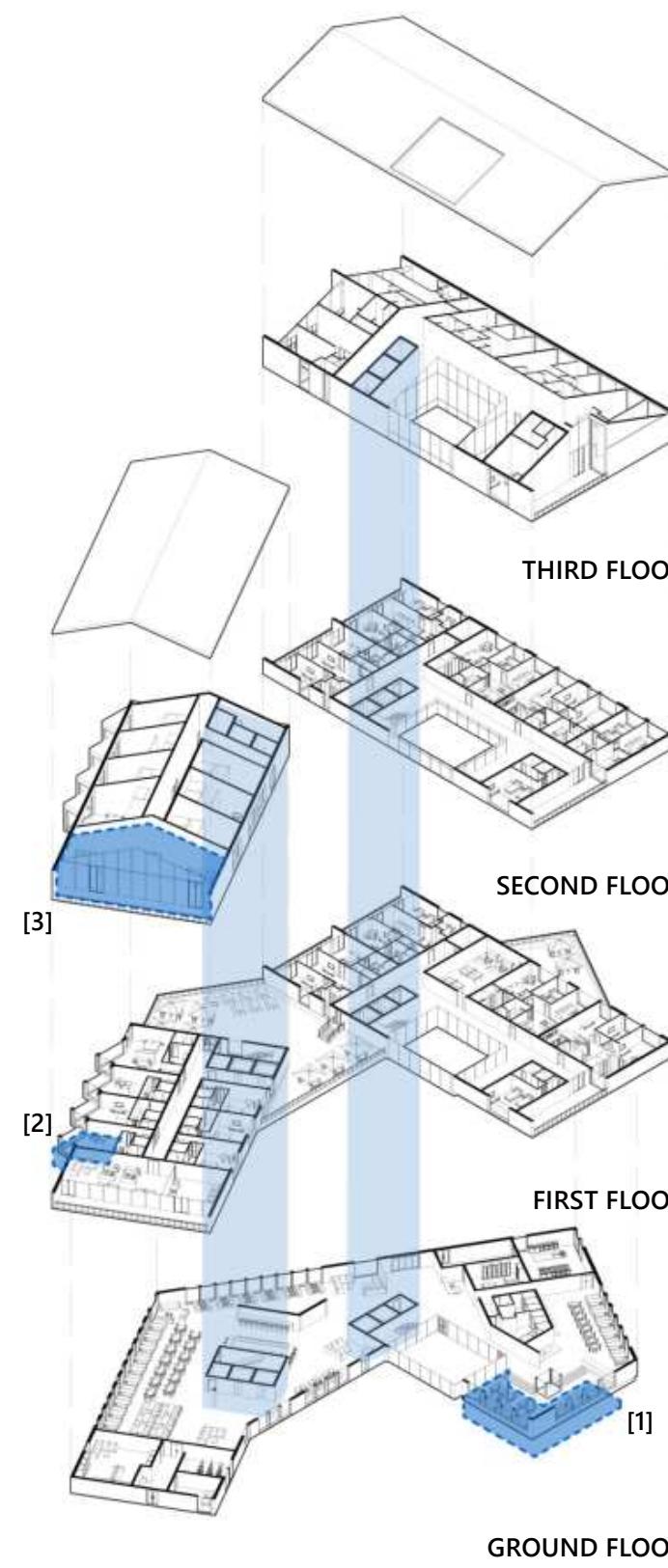


USE ENERGY DEMAND



LIFE CYCLE ASSESSMENT 20 YEARS







03

LUMIVUE CINEMA

Movie Theater Design, 2023

Academic Studio

University of Michigan

Site: Downtown, Ann Arbor

Instructor: Charlie O'Geen

Design Software: Rhino, Grasshopper(Truss, Glass Blocks, Perforated Panels), Adobe Suite, Lumion

This movie theater in downtown Ann Arbor explores how materials define space and create meaningful experiences. The design uses light as a material, with a perforated metal and glass block facade that filters light to shape different atmospheres throughout the building.

Light & Material Defining Space

- Light acts as an architectural element, shaping the atmosphere and guiding movement through the building.
- The facade filters and directs light, differentiating spaces and creating unique visual experiences.

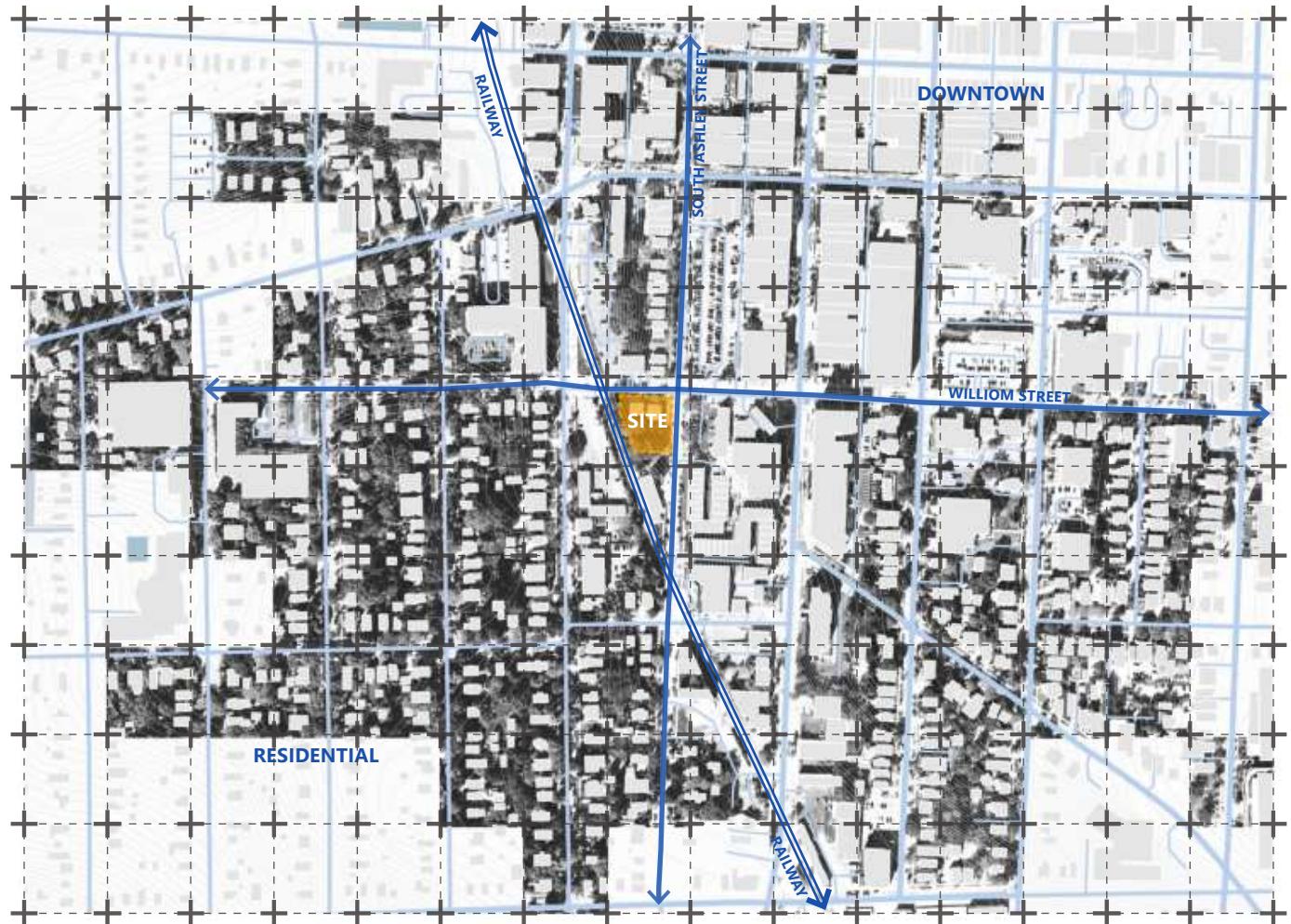
Light-Filtering Facade & Transparency

- A dual-layer system of perforated metal panels and glass blocks regulates light exposure, transparency, and opacity.
- Translucent skins around solid volumes create a dynamic contrast, enriching the visual and spatial experience.

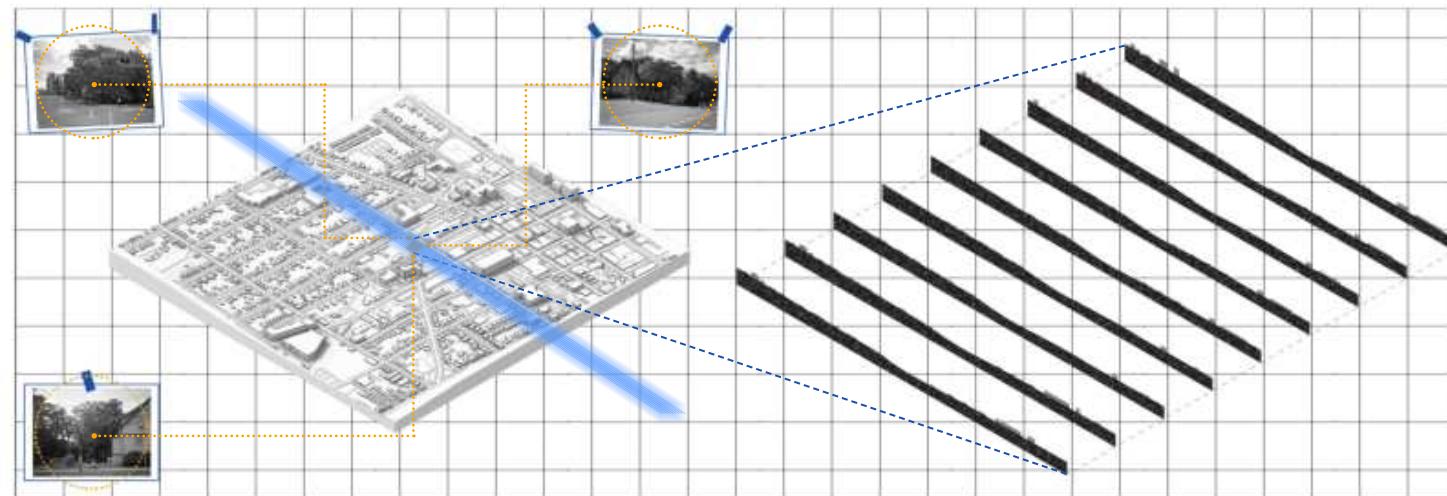
Urban Integration & Massing

- Elevated the northern volume to establish a welcoming and accessible space for public engagement.
- Designed an open-air cinema and semi-public entrance to encourage interaction between the theater and its surroundings.

SITE STATUS



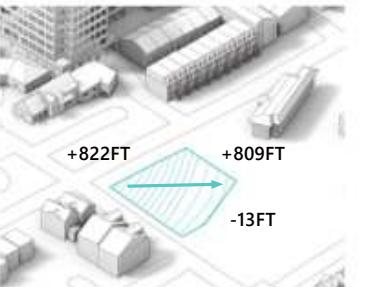
SITE SECTION



DESIGN GENERATION



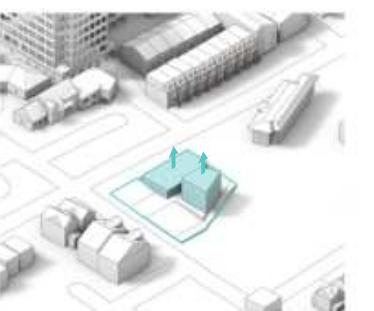
1. Site: 400 S Ashley St, Ann Arbor, MI 48103



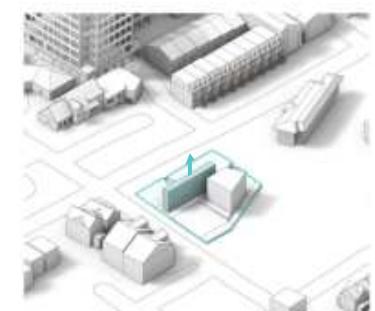
2. Use contour lines to divide the site.



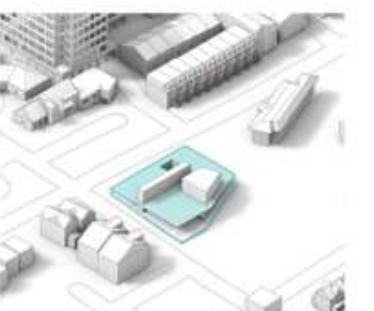
3. Create ramps for circulation and public spaces.



4. Extrude the main volumes.



5. Add supporting structure.



6. Introduce plinth and atriums.

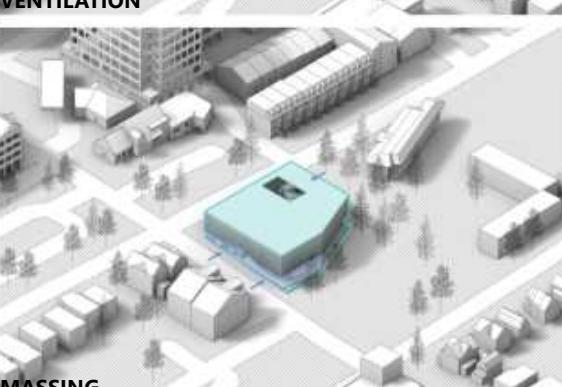


7. Introduce the spaces for cinema.

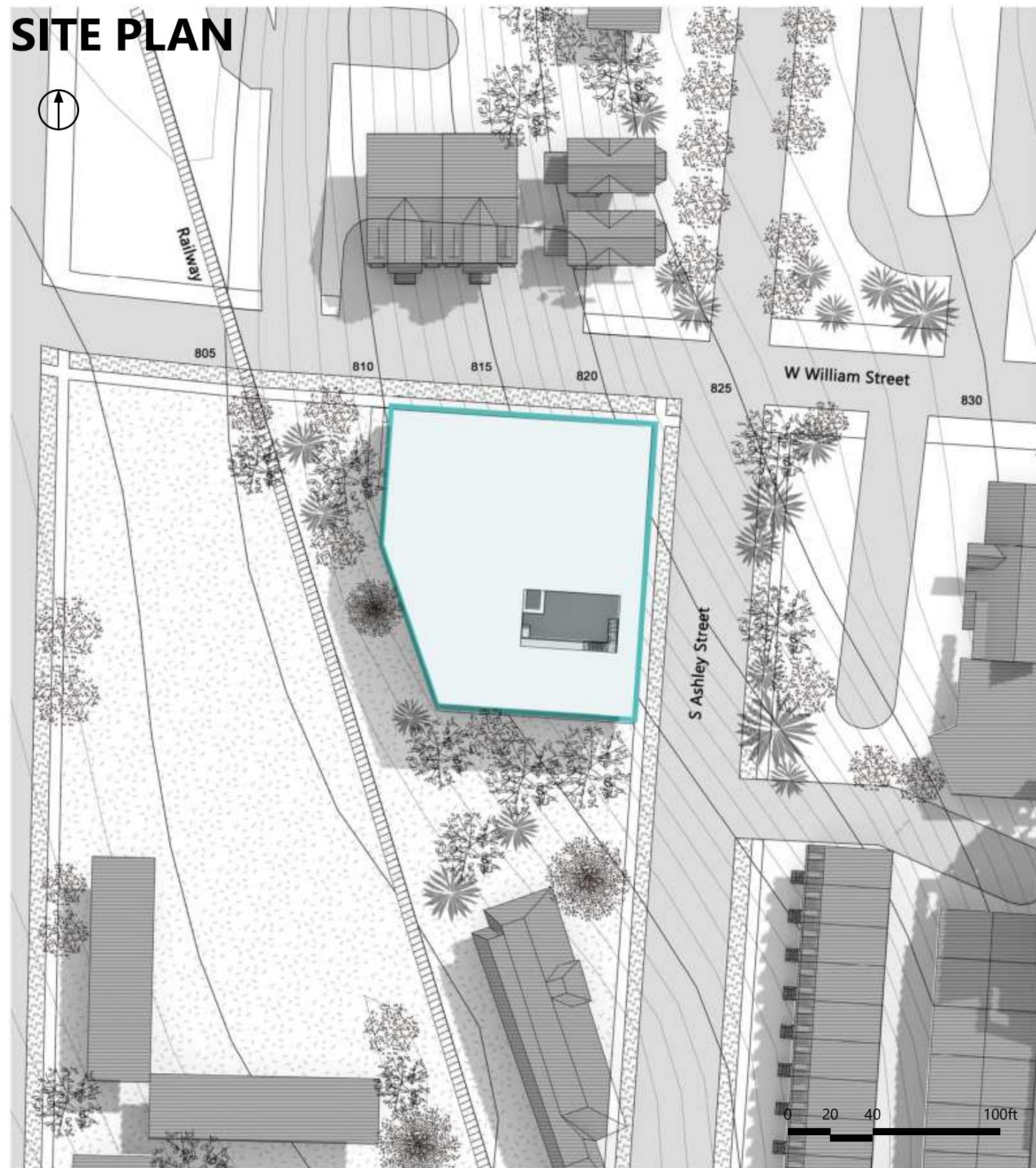


8. Incorporate a light-filtering exterior facade.

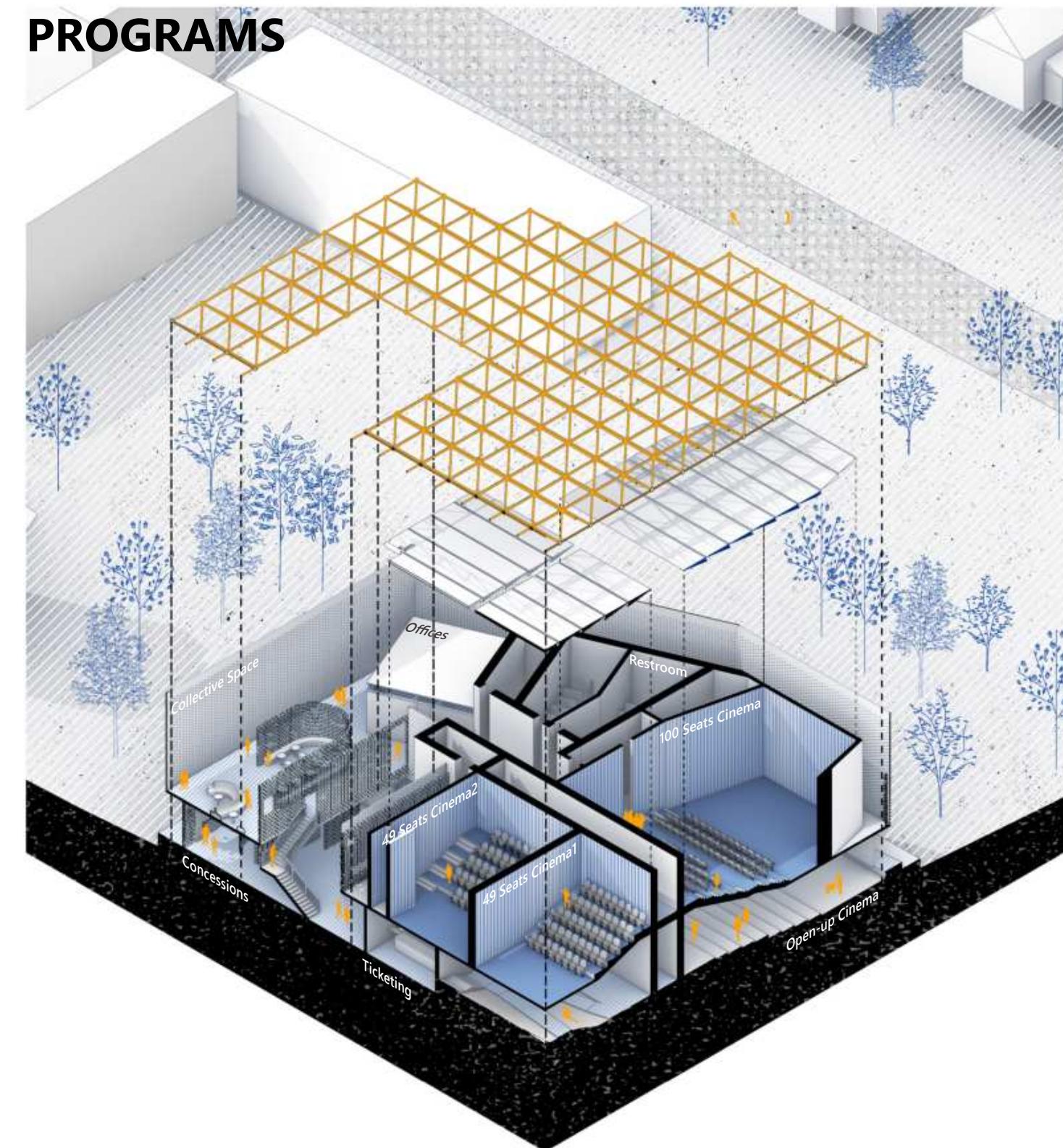
DESIGN ANALYSIS



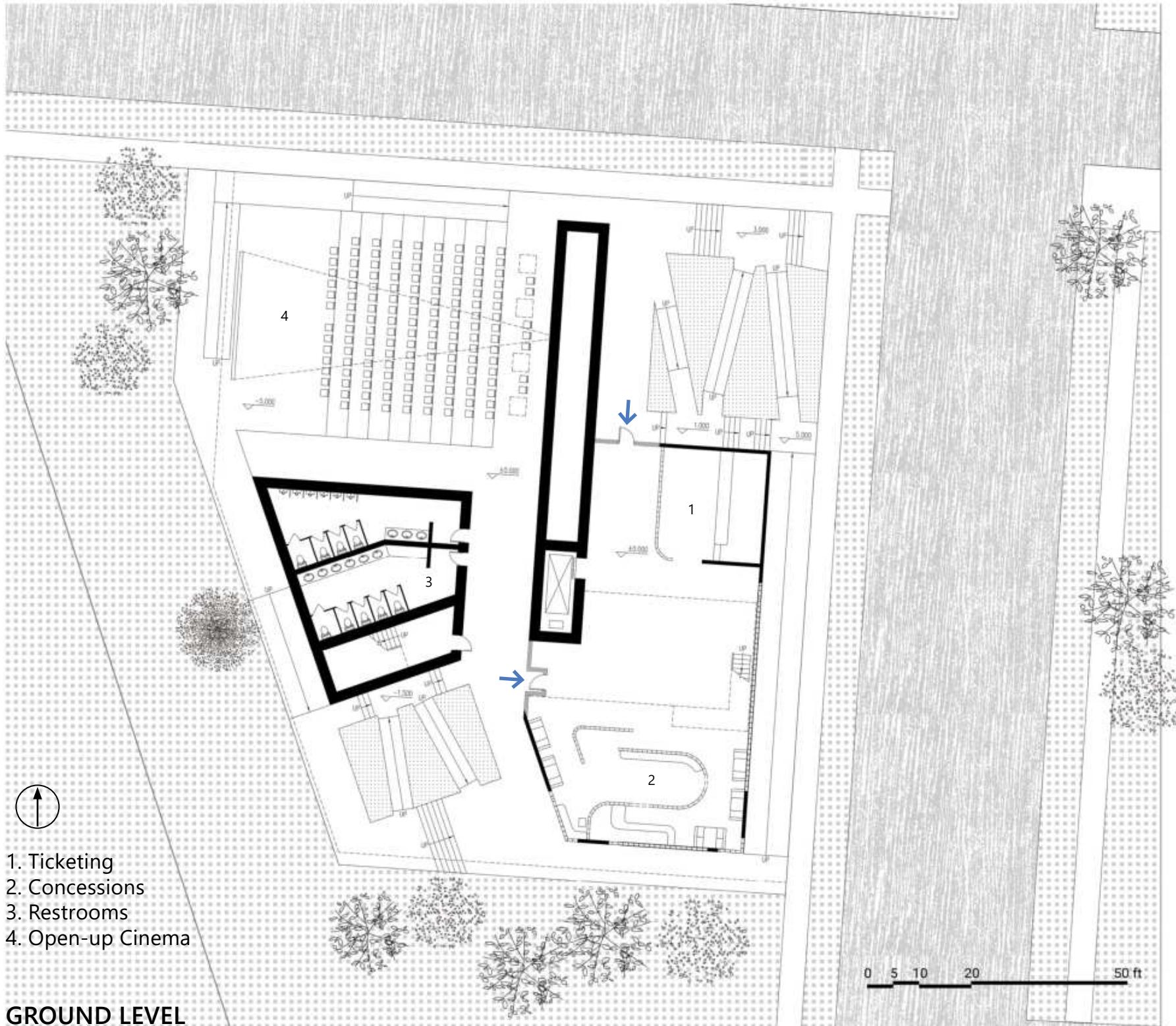
SITE PLAN



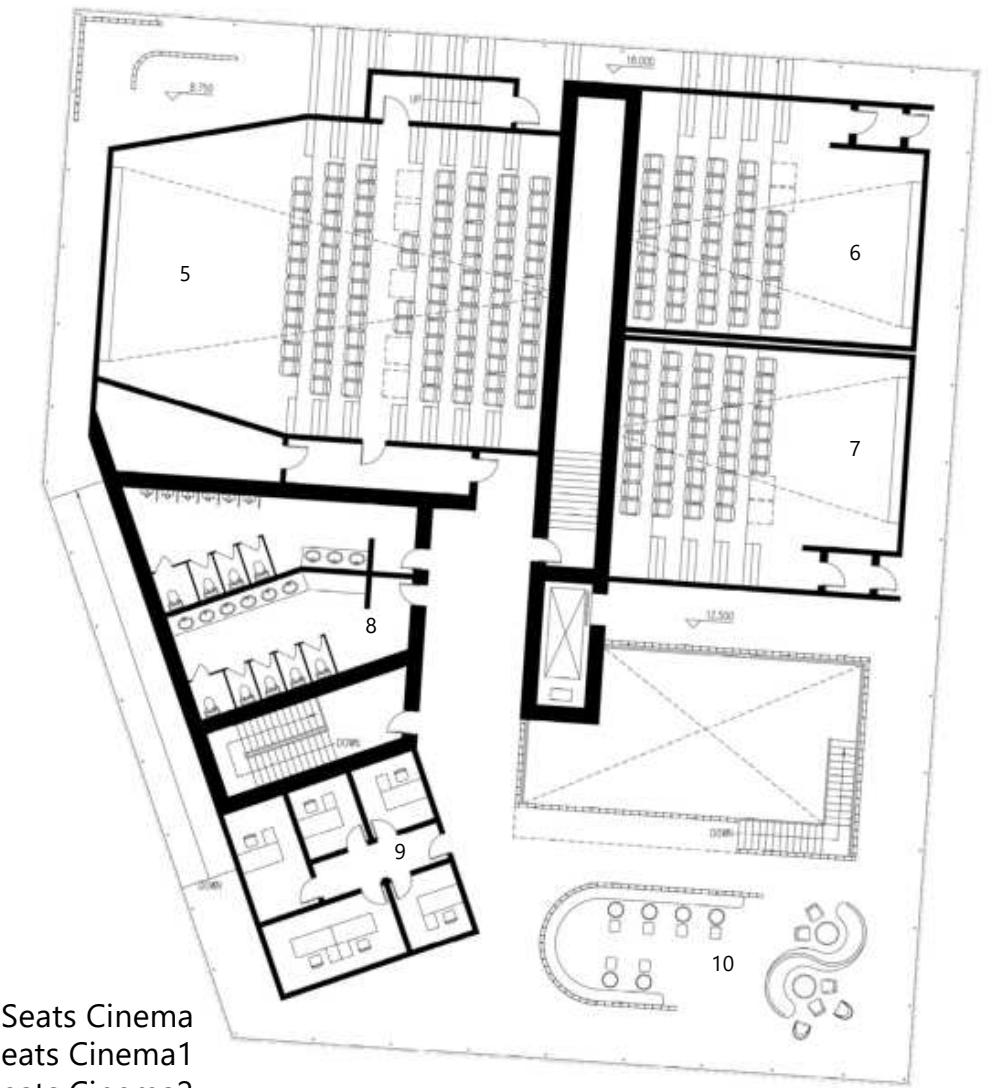
PROGRAMS



FLOOR PLAN



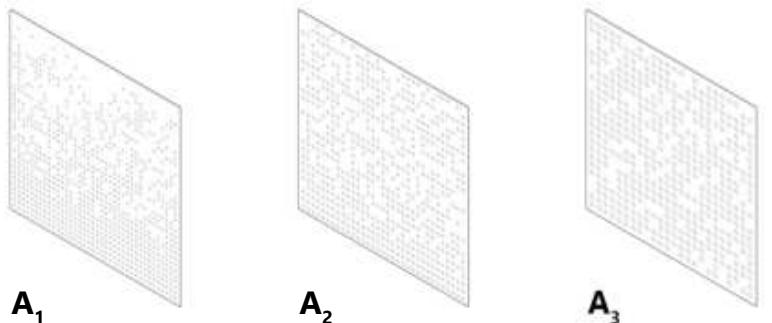
GROUND LEVEL



FIRST LEVEL

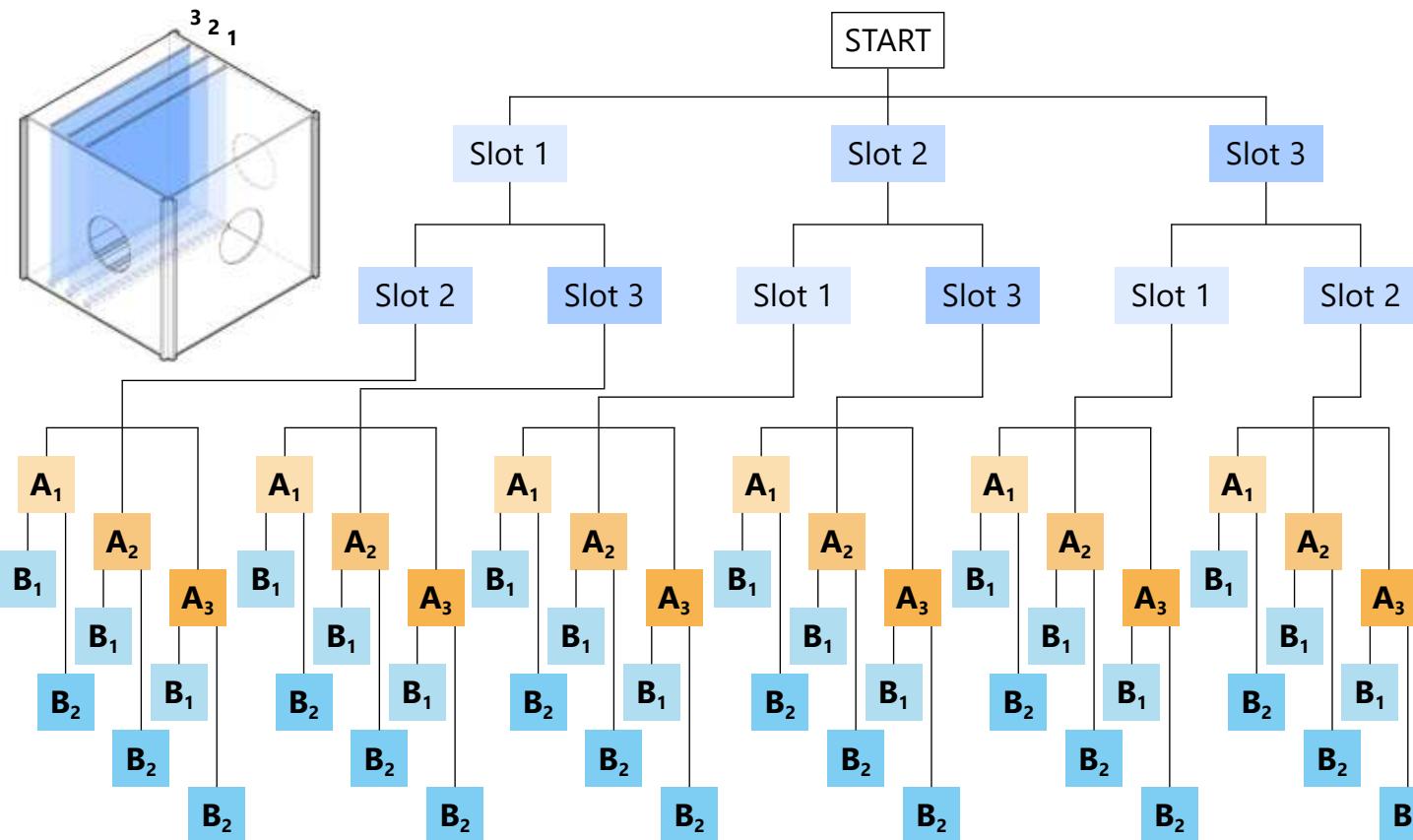
CONCEPT-MATERIAL TEST

PERFORATED PANELS (CHIPBOARD)



Size of the holes: Small → Large
Density of the holes: High → Low

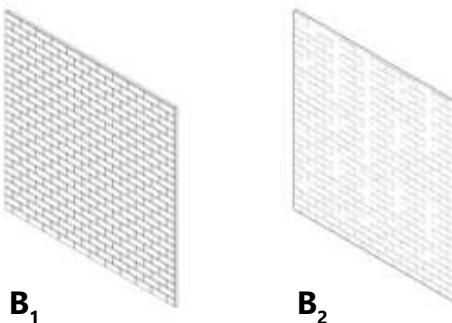
LIGHT BOX



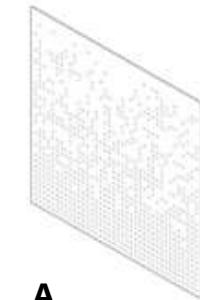
In the Material Test, a lightbox created to observe the different light patterns caused by sunlight passing through light filter panels from various directions. The top of the box has several slots where you can insert any panels to observe the different effects of perforated plates and glass blocks when combined in different orders, placed at different depths, or placed individually.

LIGHT PATTERNS

GLASS BLOCKS (ARCYLIC)



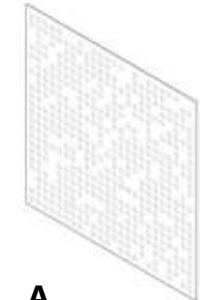
Without Pattern With Pattern



A₁
OVERCAST



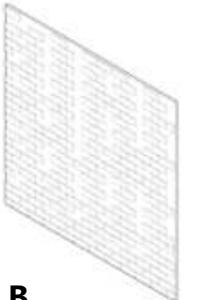
SUNNY



A₃
OVERCAST



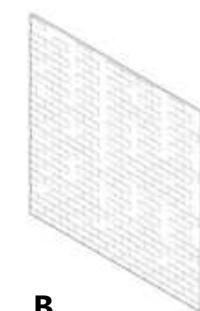
SUNNY



B₂
OVERCAST



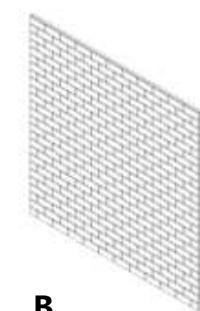
SUNNY



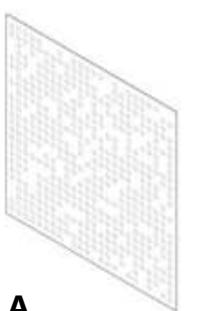
B₂



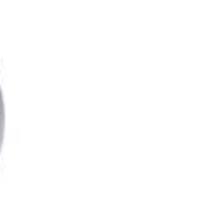
A₂



B₁



A₃





COLLECTIVE SPACE



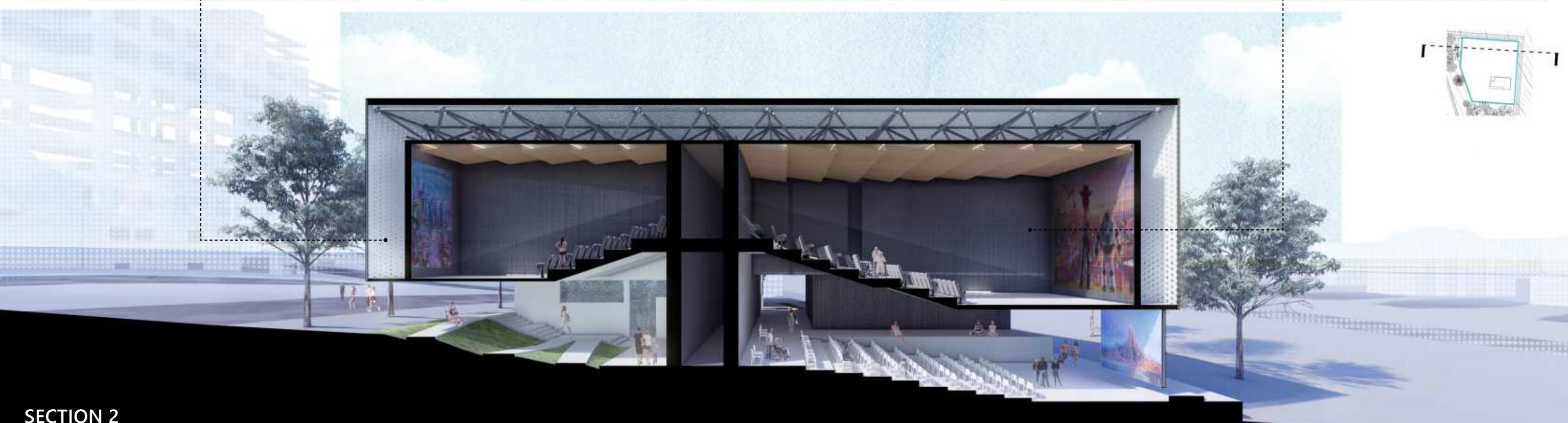
DOUBLE-HEIGHT SPACE



HALLWAY



SECTION 1

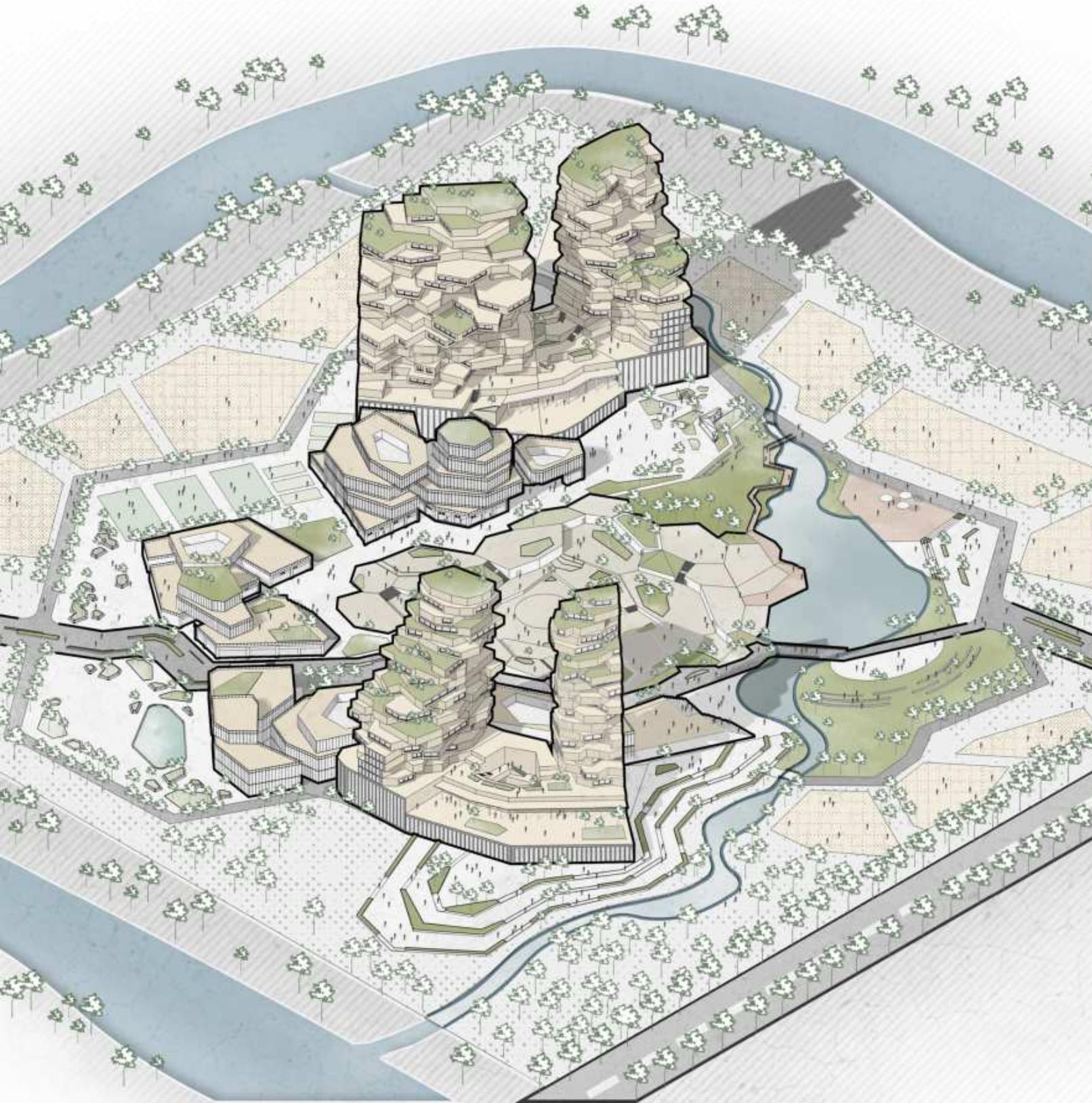


04

MULTIVERSE——THE MOON AND SIXPENCE

Future Urban Design, 2020
Design Competition (Group Work)

Site: Tianjin, China
Design Software: Rhino, Grasshopper (Design Process), Adobe Suite, Lumion



This urban design proposal reimagines Yangliuqing's southern islet as a connected, efficient, and diverse community. Using Grasshopper and Python, we optimized circulation and spatial organization, ensuring seamless connectivity and efficient land use.

Parametric Design & Computational Planning

- Used Grasshopper and Python to analyze circulation patterns, optimizing road networks and spatial layout.
- Applied Voronoi diagrams with Genetic Algorithm to divide the site and Dijkstra Algorithm to generate efficient road networks and river paths.

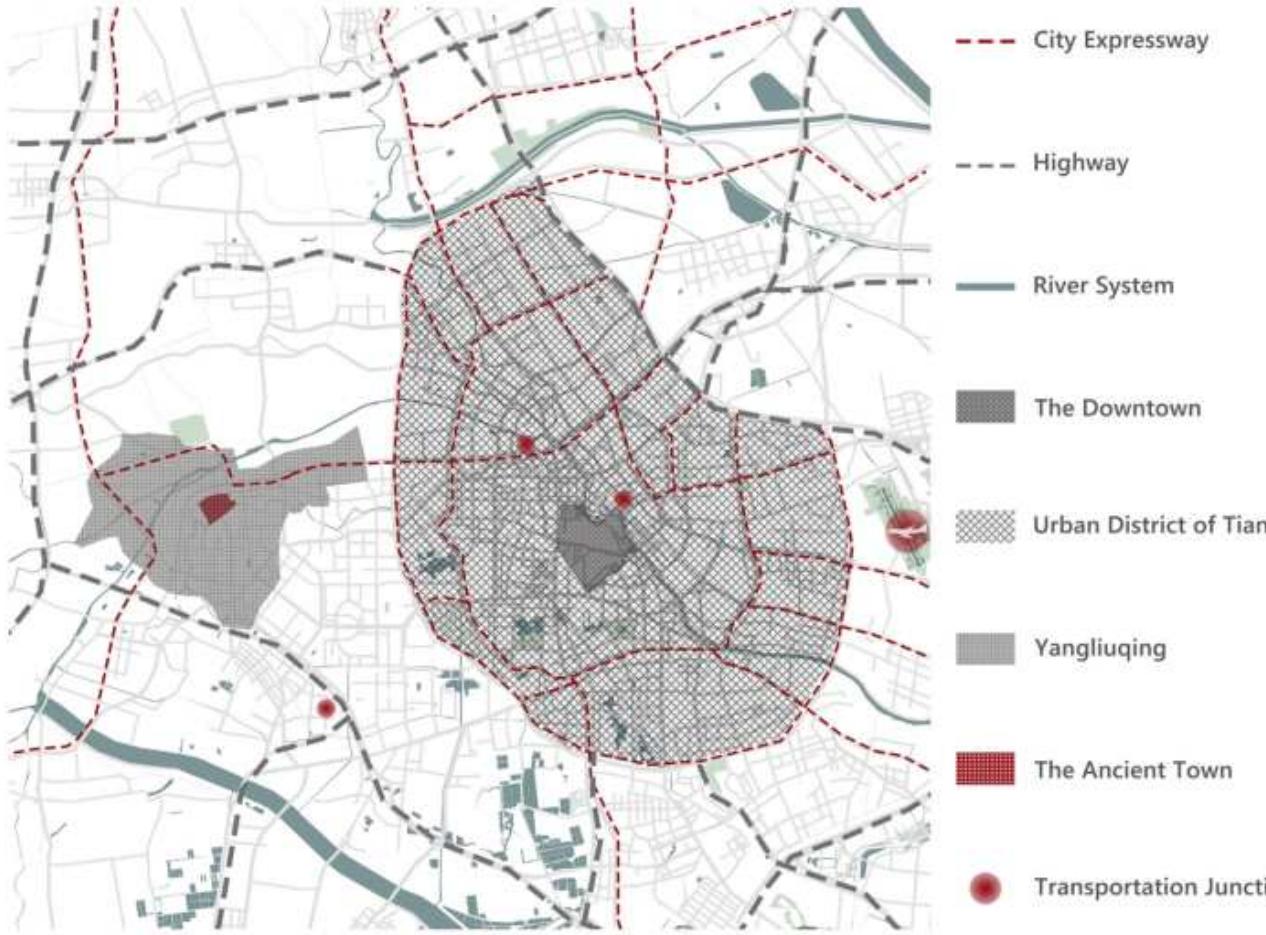
Sustainable & Human-Centred Integration

- Preserved farmland while modernizing urban life, balancing growth with tradition.
- Mixed-use layout places residential areas in the 2nd & 4th quadrants, public spaces in the 1st & 3rd, optimizing sunlight, wind, and transit access.

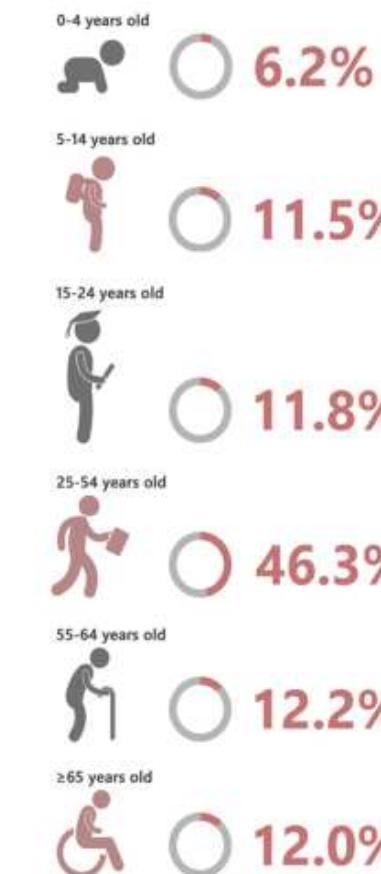
Blending Urban & Rural Lifestyles

- Perimeter farmland supports local food production and agricultural traditions.
- Balcony gardens and rooftop greenspaces encourage small-scale urban farming and self-sufficiency.

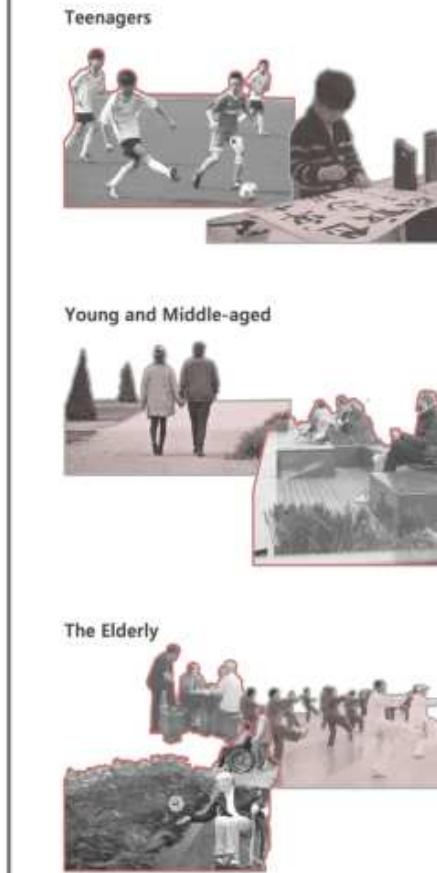
LOCATION ANALYSIS



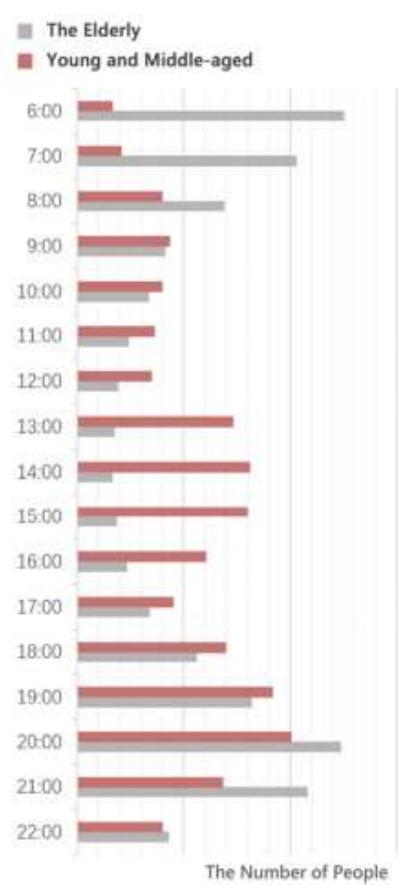
AGE STRUCTURE



ACTIVITIES



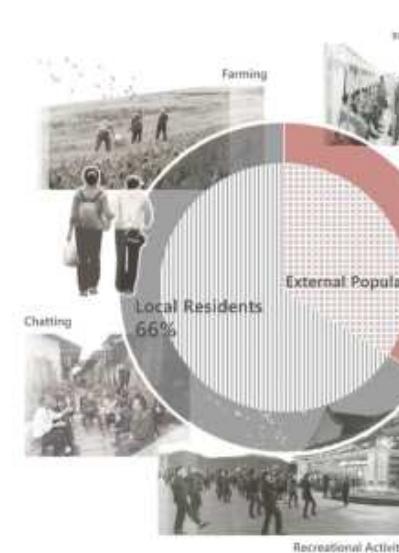
TIME TREND



SITE ANALYSIS

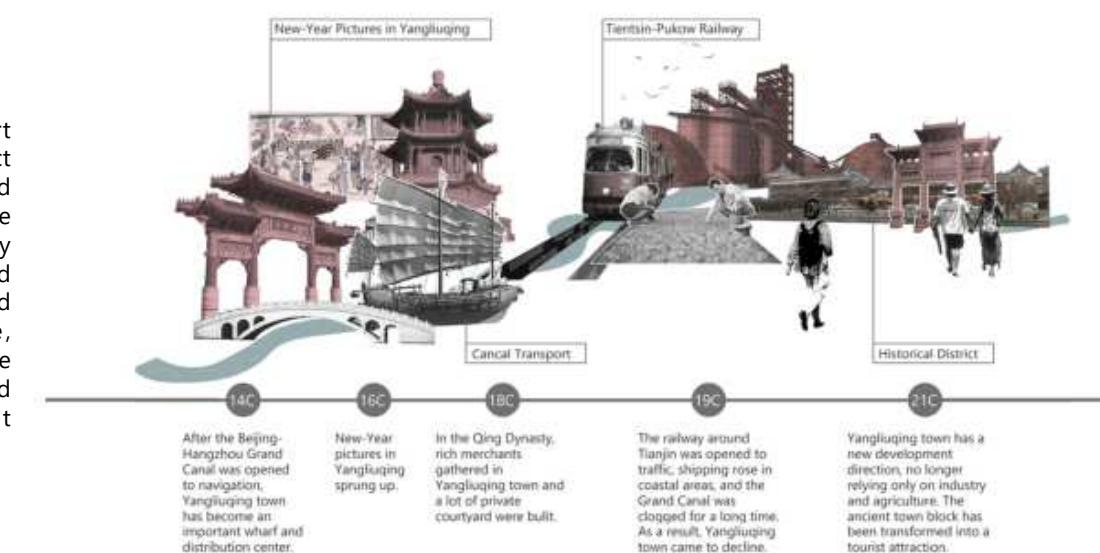


DOMICILE PLACE ANALYSIS



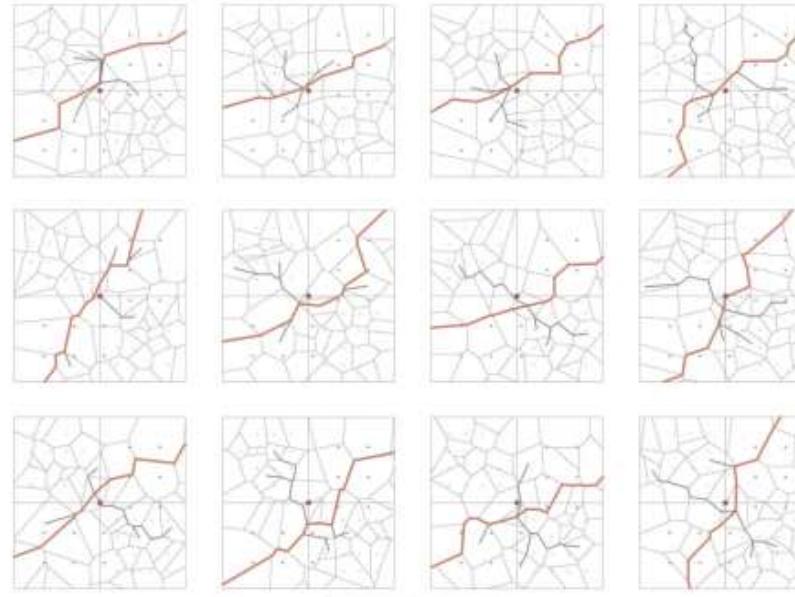
The metropolitan outskirt communities like this project are in mixture of urban and suburban system. They are complicated in popularity composition, followed with cultural conflicts and integration. Therefore, various space forms are demanded to meet the need of people from different backgrounds.

THE HISTORY OF YANGLIUQING



DESIGN THINKING

The site is located in an islet which is on the south of the ancient town of Yangliuqing. We divided the site into 4 quadrants. The entrance and the exit are on the southwest and northeast of the site. In consideration of directions of the wind in summer and winter; illumination and the metro station, the residential buildings are located in the 2,4 quadrant, the public buildings in the 1,3 quadrant. Then the program divided the site by the location of points and Voronoi diagram with Genetic Algorithm.



CHOSEN PROJECT



FORMATION OF THE RIVER MORPHOLOGY



PROGRAMS



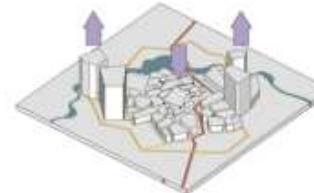
DESIGN GENERATION



1. Transit Network Based on Voronoi Diagram



2. Division of Built-up Areas



3. Elevation Differences Based on Functions



4. Residential Buildings Design



5. Public Buildings Design



6. External Landscape Design

SITE PLAN



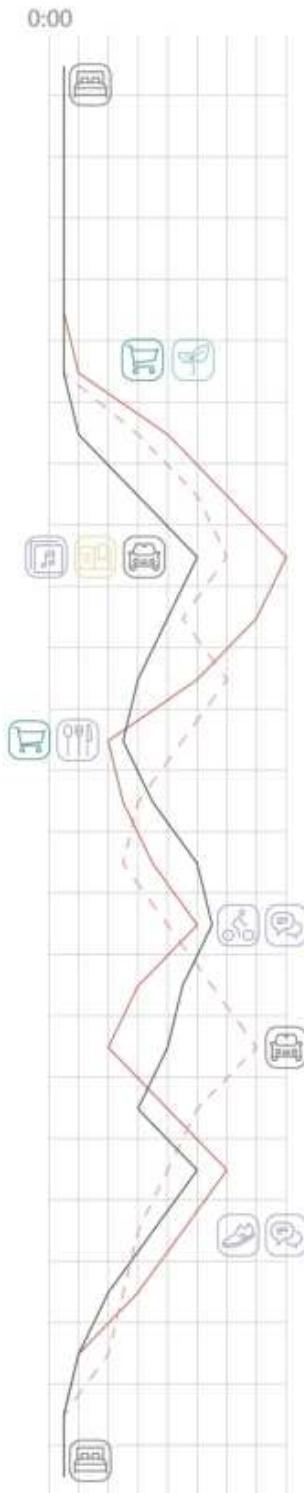
The grocery stores are located in buildings on the edge of the sunken plaza.

The community service center and the nursing home are located in the podiums of the residential buildings. There is a roof garden in the residential area. In addition, every family can plant on the balcony.

The farmland is distributed on the edge of the site.

- ① Sunken Plaza
- ② Residential Buildings
- ③ Tennis Court
- ④ Basketball Court
- ⑤ Planetarium and Bookstore
- ⑥ Art Gallery
- ⑦ Cultural Center
- ⑧ Shopping Center
- ⑨ Agricultural Plantation Experience Pavilion
- ⑩ Events Plaza
- ⑪ Therapeutic Garden
- ⑫ Waterfront Wooden Trestle
- ⑬ Open-air Theater
- ⑭ Farmland
- ⑮ Entrance Plaza
- ⑯ Main Road

CUSTOMIZED ROUTES



SPACES



Theater



Agricultural Plantation Experience Pavilion



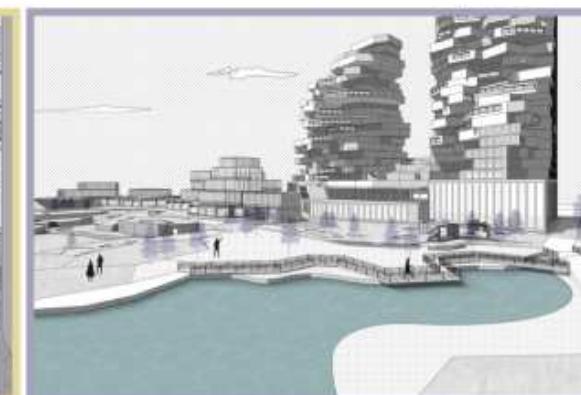
Bookstore



Grocery Store

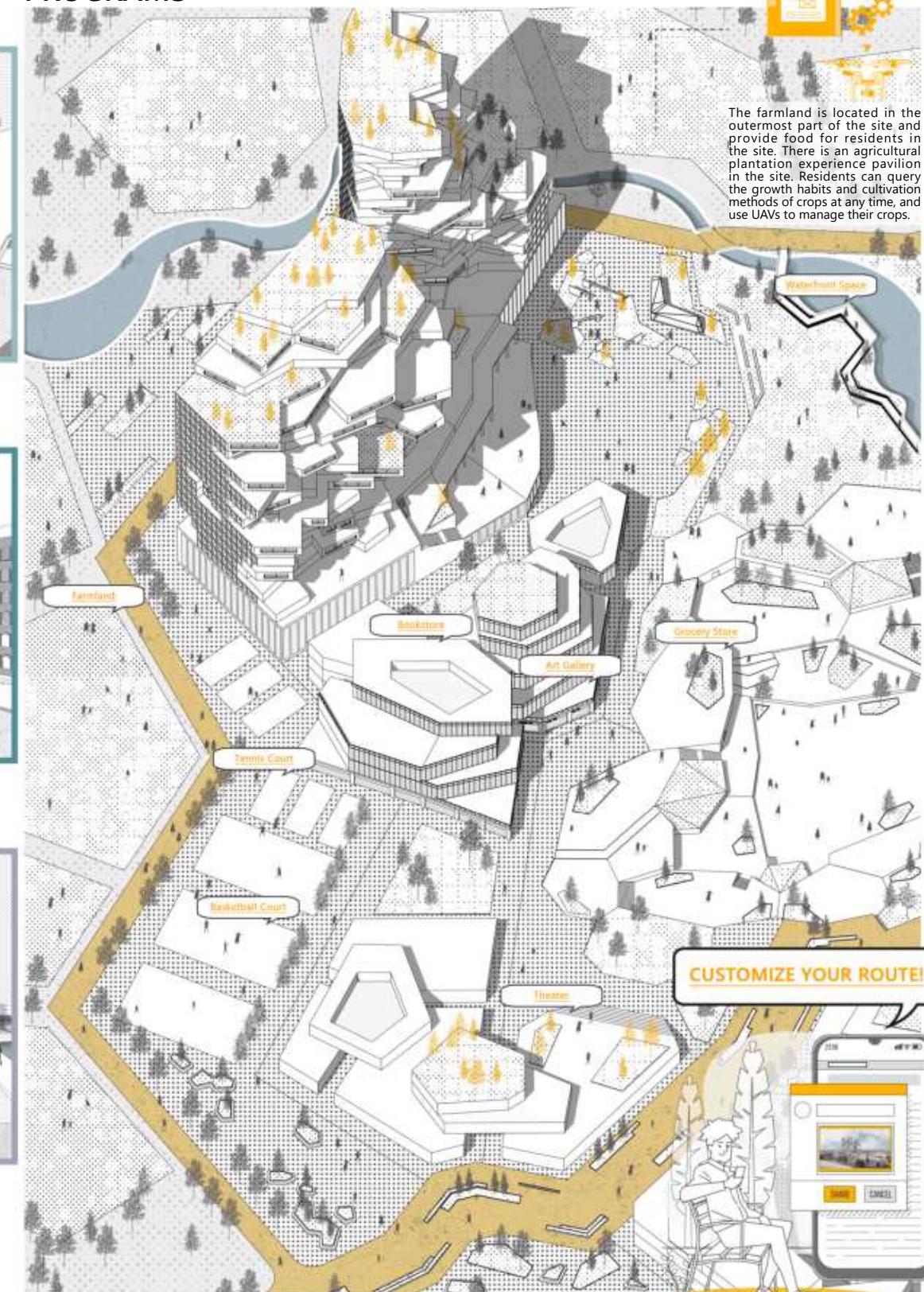


Art Gallery



Waterfront Space

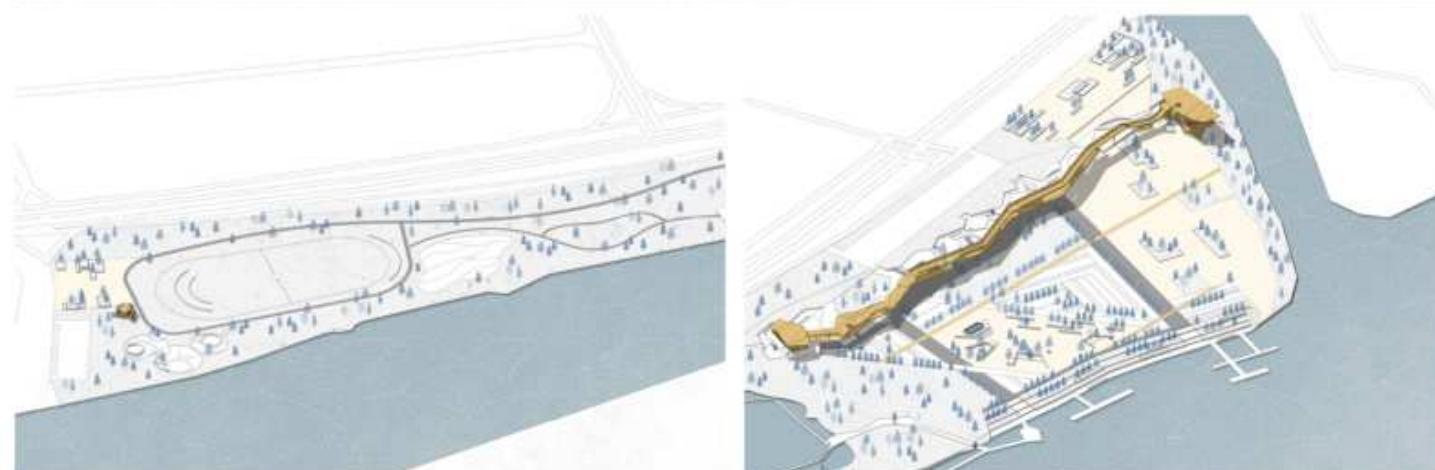
PROGRAMS



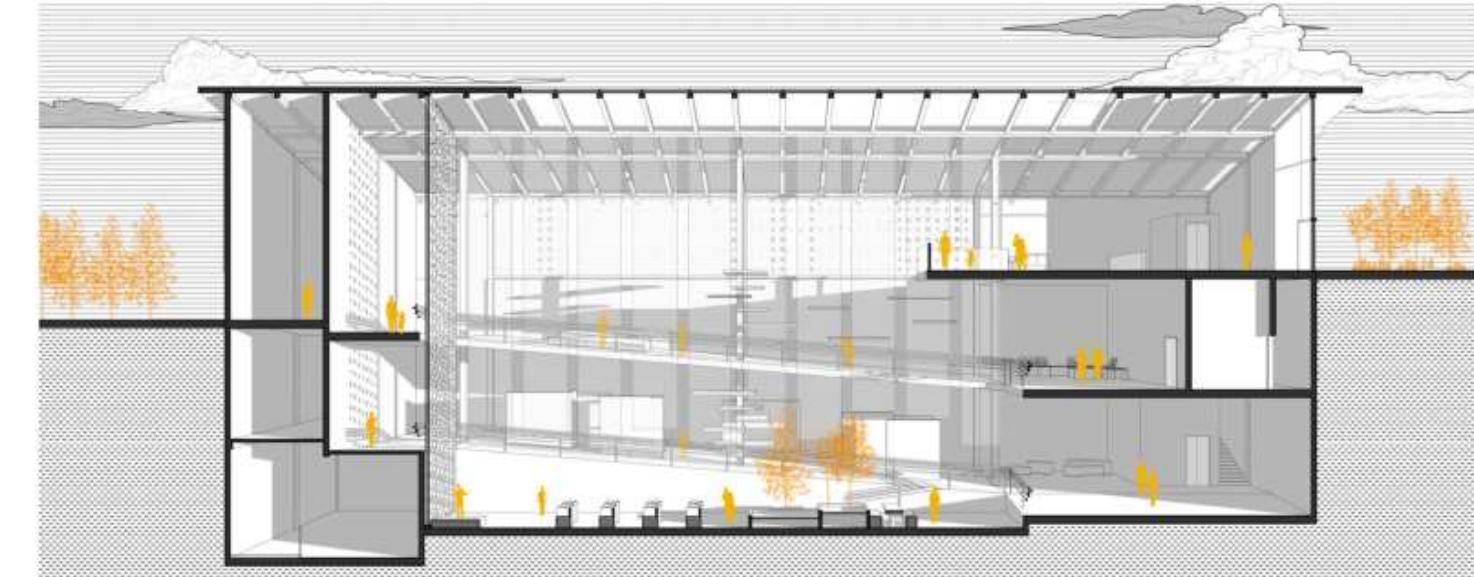


OTHER WORKS

The Biological-breath Corner
Wetland Park Design, 2020

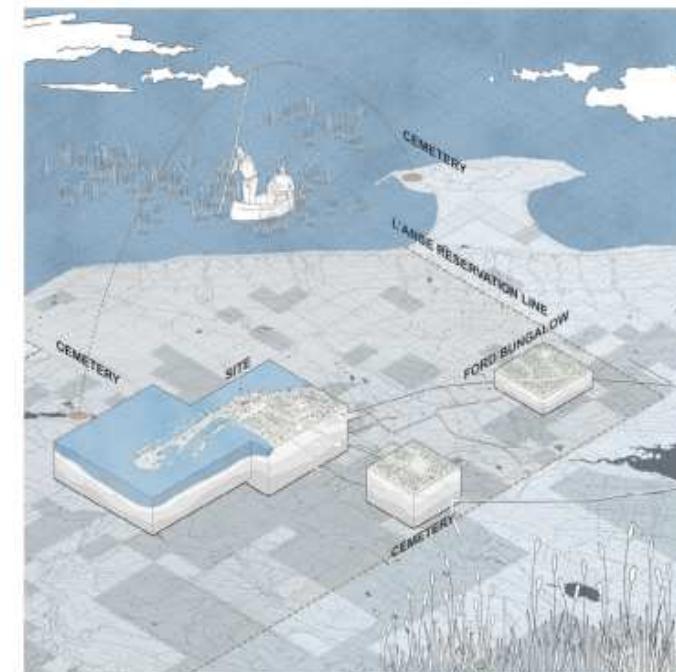


The Planning and Design of Yuyao Ceramic Kiln
Undergraduate Thesis, 2021



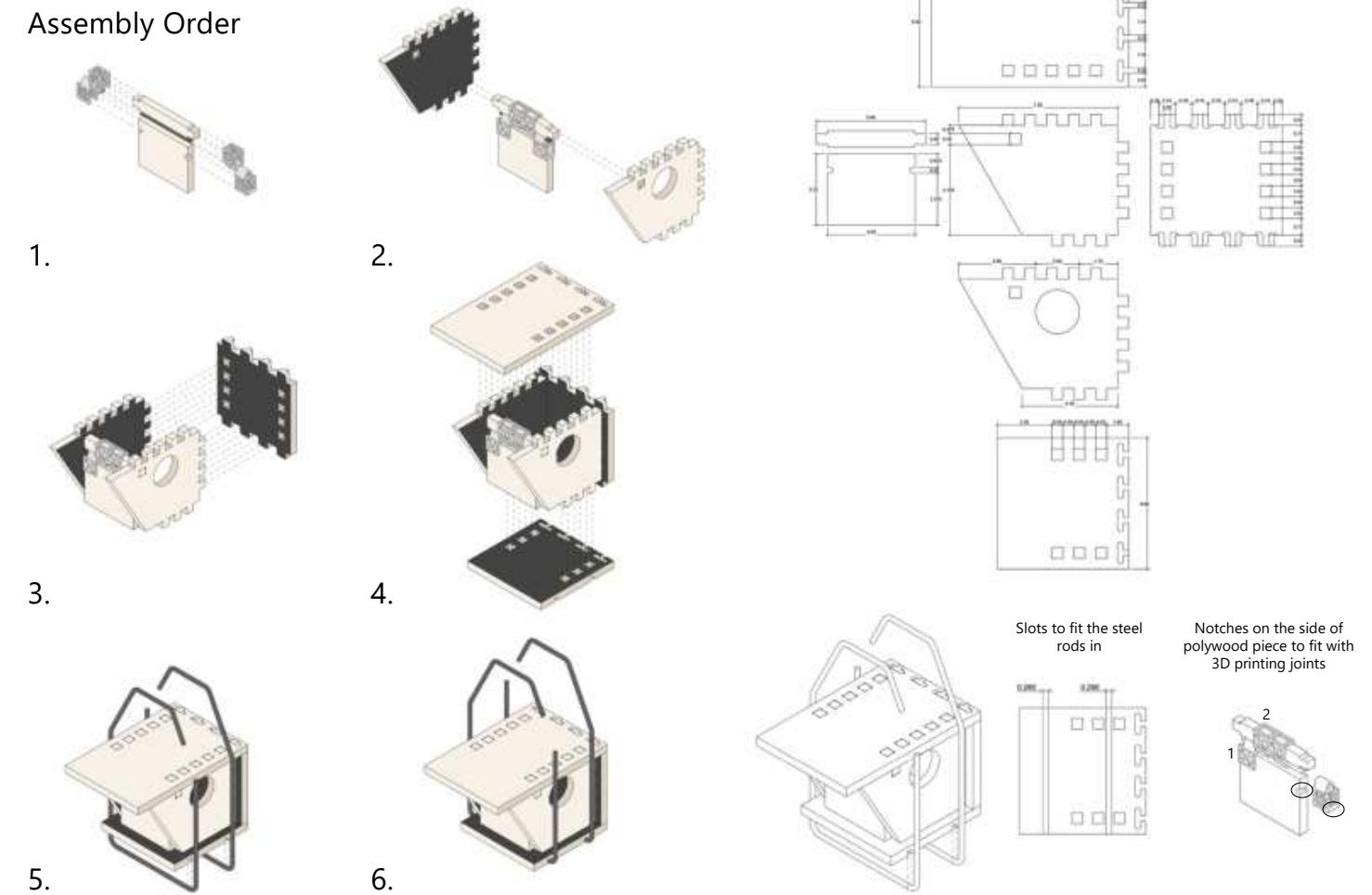
OTHER WORKS

Keneenaw Bay-Afterworlds Memorial Design
Propositions Studio, 2024



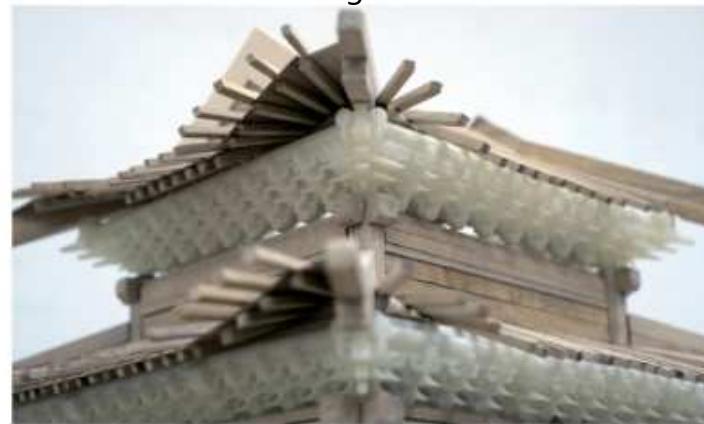
Nest Box Design
Fabrication 2023 (CNC, 3D Printing, Rob Bending)

Assembly Order

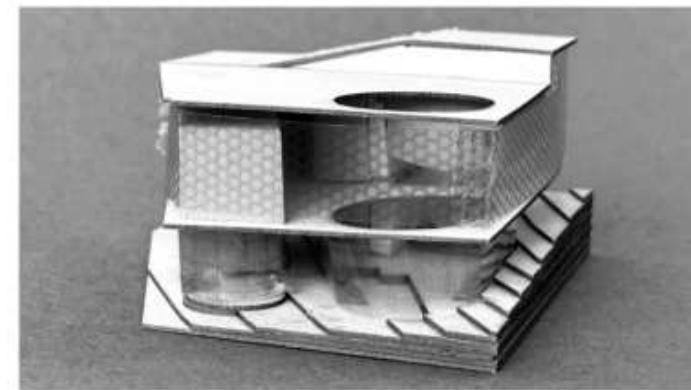
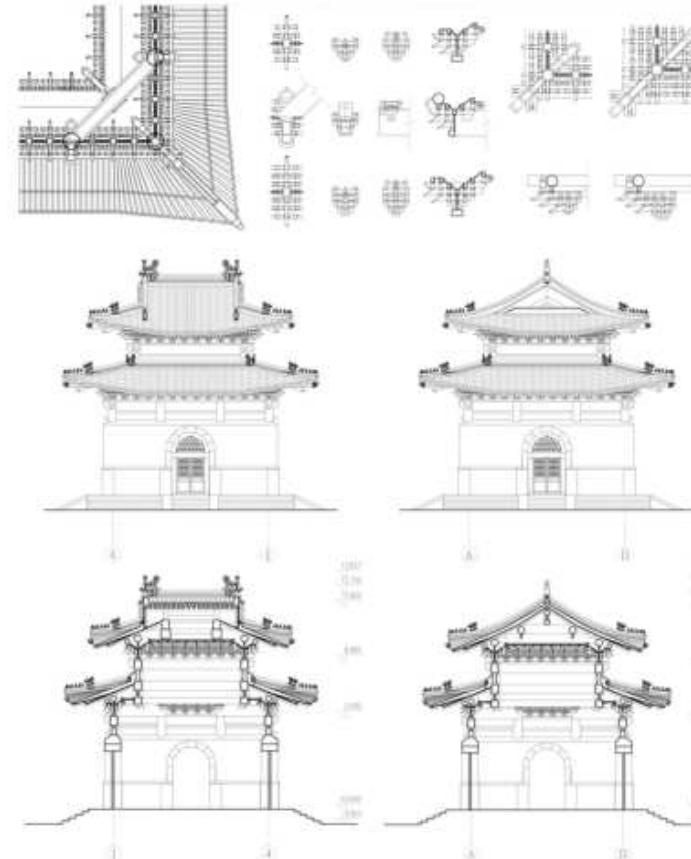
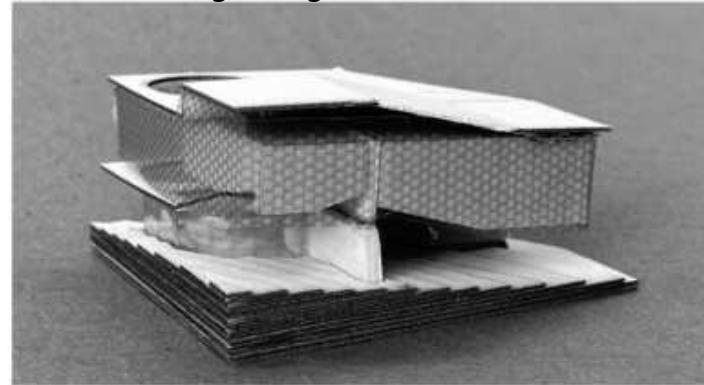


DRAWING & MODEL

Traditional Chinese Architecture Survey Drawing
Pavilion in Western Qing Tomb



Model in Design Progress (Institution Studio)

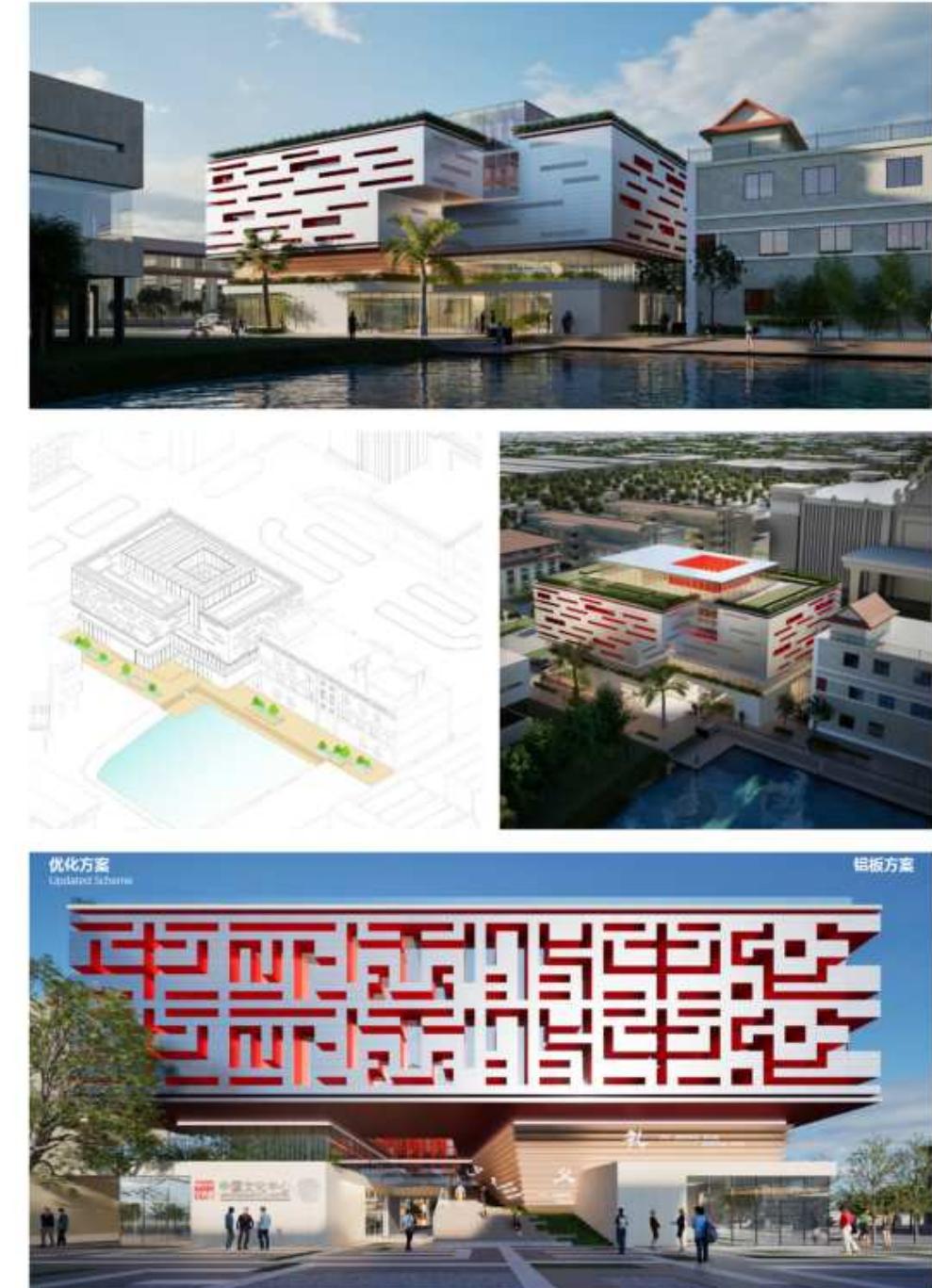
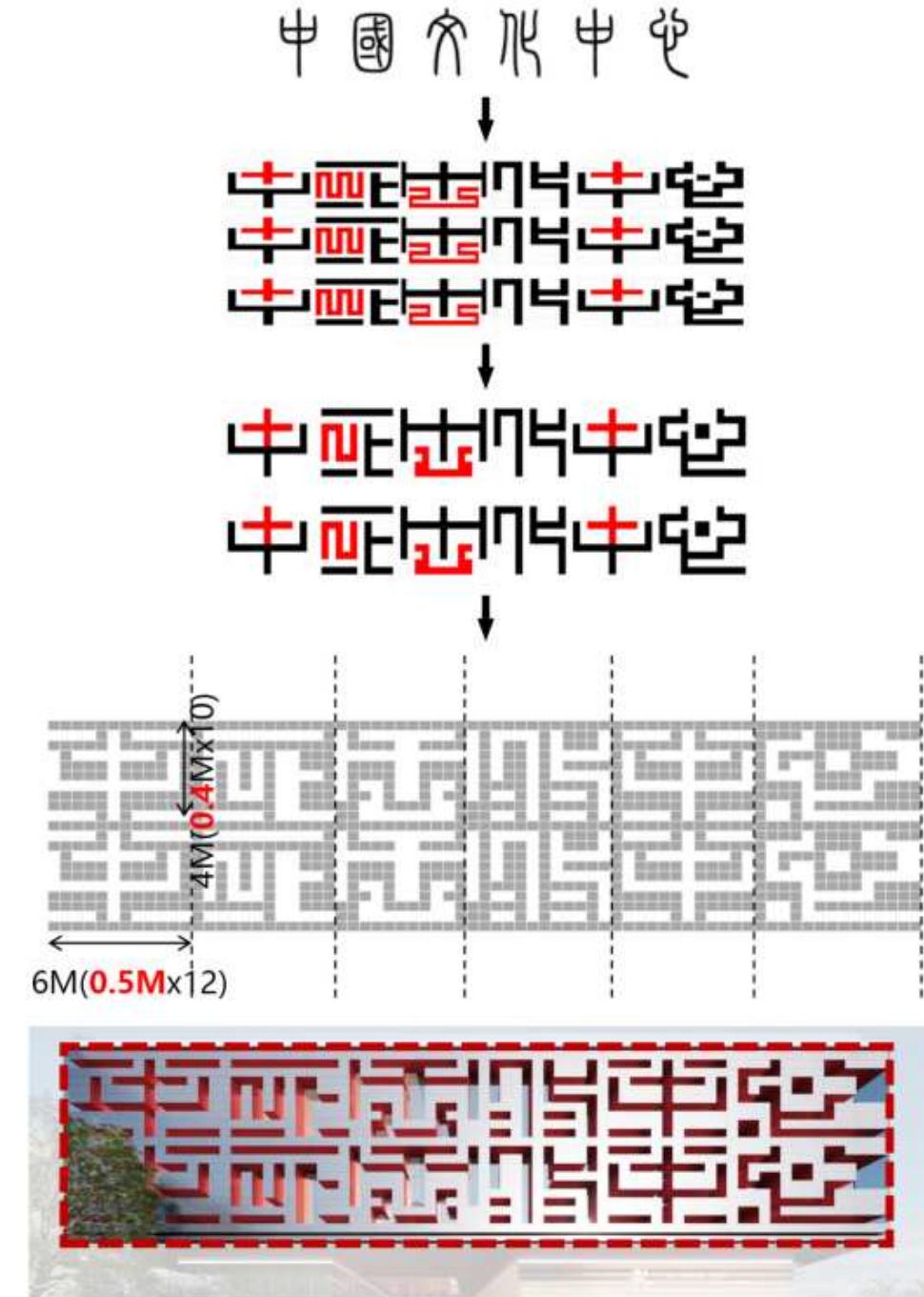
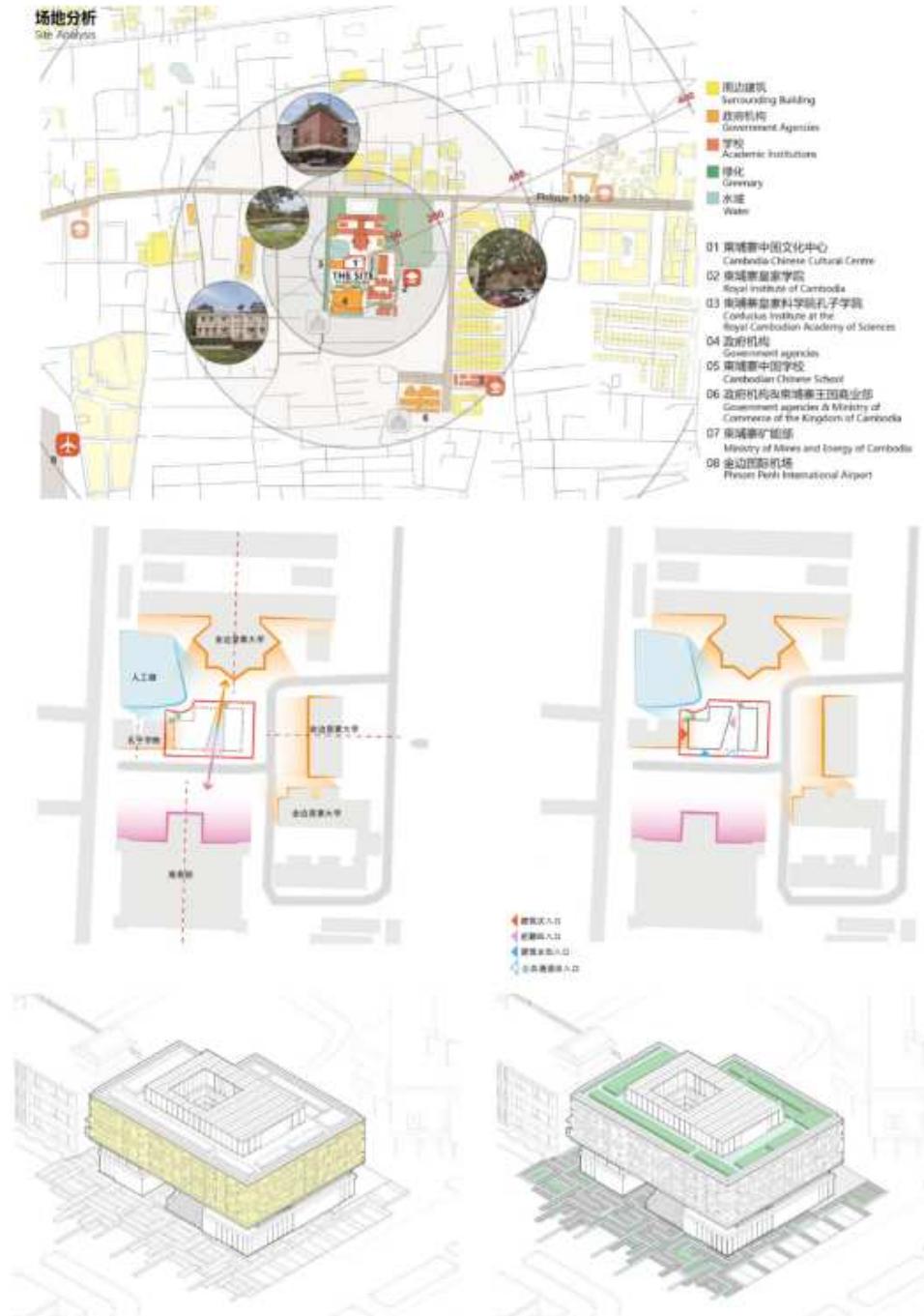


PROFESSIONAL WORK

Work during Internship at RSP

Cambodia Chinese Cultural Center, Phnom Penh

Role: conducted site analysis; produced diagrams, renderings and presentation layout; aided in landscape design; conducted material research and implemented façade design concepts.



PROFESSIONAL WORK

Work during Internship at RSP

Highspeed Railway Station Expansion, Deqing

Role: produced diagrams, plans, renderings and presentation layout; aided in landscape design



Video Rendering by Lumion, Fuzhou

