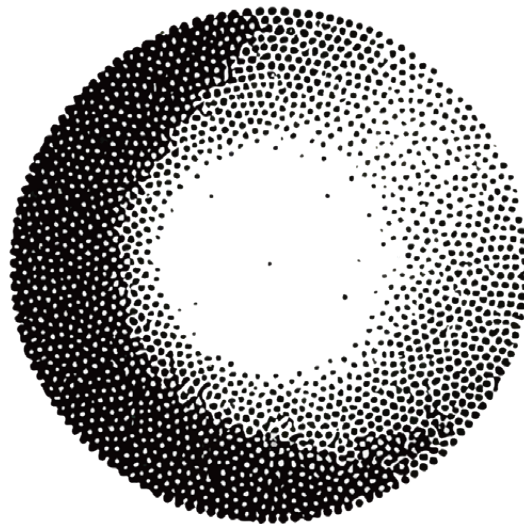


GUAN -YI SIAO

GSAPP Graduation Portfolio



After Materiality

This chapter explores how materiality can be redefined after its original form, function, and lifespan. Across three projects, material is not treated as a fixed substance, but as something that can be scanned, mutated, decomposed, reused, and regenerated. **After Vessel** examines digital media as material through images, scans, and representational mutations. **Sweettransition** transforms sugarcane bagasse into carbon-storing bio-bricks. **Zero to Zero** reuses urban waste as modular building elements for circular habitats and ecological infrastructure.

01 2025 Summer

After Vessel

Digital Media as Material

Images, scans, and digital representations become new architectural materials through mutation and translation.

02 2025 Fall

Sweettransition

Agricultural Waste as Material

Sugarcane bagasse is transformed into carbon-storing bio-bricks for a regenerative Olympic park.

03 2026 Spring

Zero to Zero

Urban Waste as Material

Urban waste is reused as modular building elements for circular habitats, public programs, and ecological recovery.



AFTER VESSEL

MATERIAL MUTATIONS

2025 Summer Studio
 Instructor : Michiel Helbig
 TA : Ziqian (Luna) Xu
 Team: Guan-Yi Siao, Nien Lee, Shao-Wei Wang

GSAPP Graduation Portfolio

GUAN-YI SIAO

01
EVERYWHERE
TRACING THE VESSEL

Using the Vessel in Hudson Yards as a case study, this project traces architecture across visible, invisible, digital, and physical domains.

It reframes the Vessel as a distributed image device shaped by media, circulation, fabrication, and cultural references.

Through this mapping, the project develops new modes of representation that translate images into architectural form.

Digital representation is not secondary to architecture. It becomes part of its material condition.



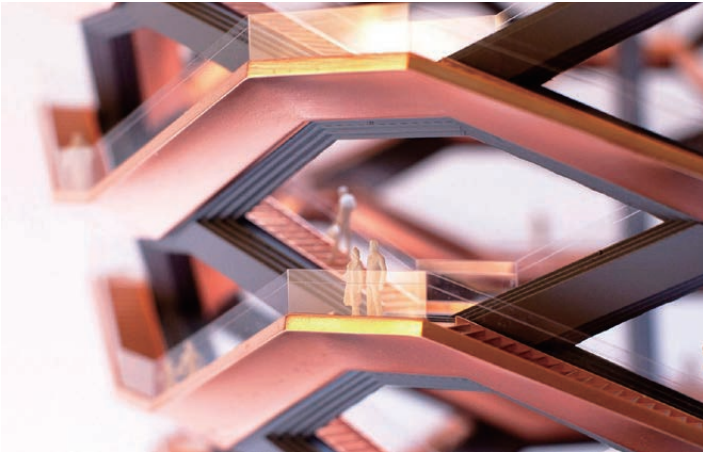
Original

Rajasthan, India
Chand Baori, Step Well



Design Studio

London, UK
Heatherwick Studio



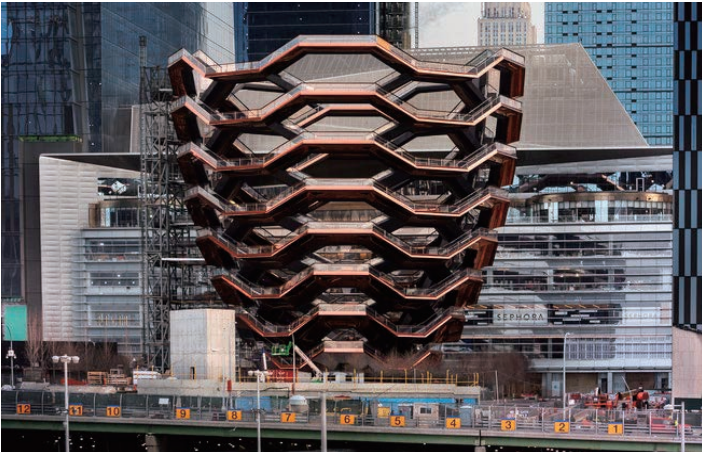
Manufacturing

Monfalcone, Italy
Cimolai company



SITE

New York, USA
The Vessel



02
EVERYTHING
MUTATING THE VESSEL

This project generates speculative mutations of the Vessel using images, models, and maps as design material.

These transformations challenge the idea of a fixed architectural object and reveal the Vessel as a product of media circulation and image culture.

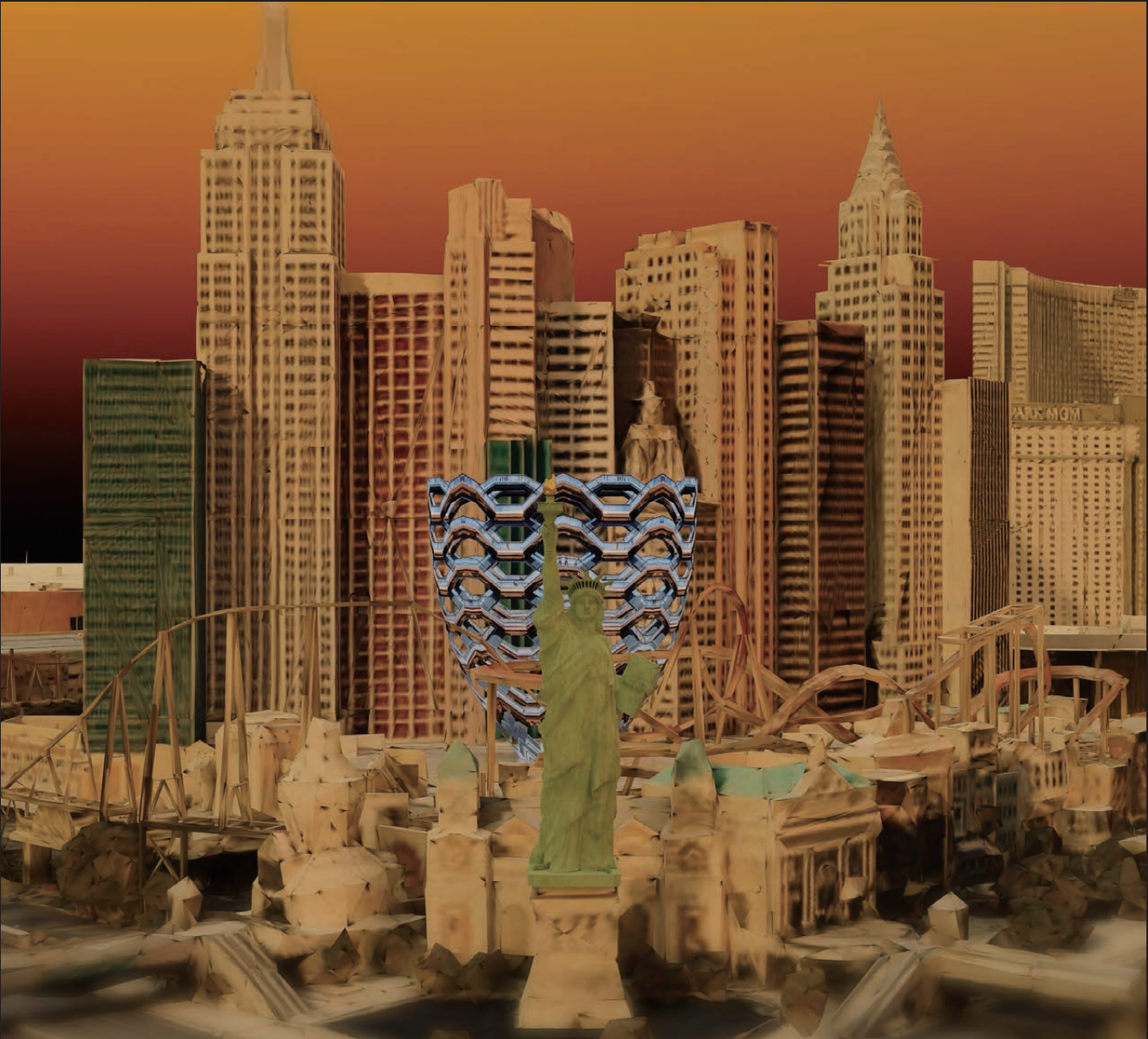
Through these experiments, architecture is redefined as a process of continuous translation across contexts.



Reimagining the Vessel as a landmark adapted to different places



Recycled Vessel generated from scanned stair data



Exploring how copied images reshape architectural meaning

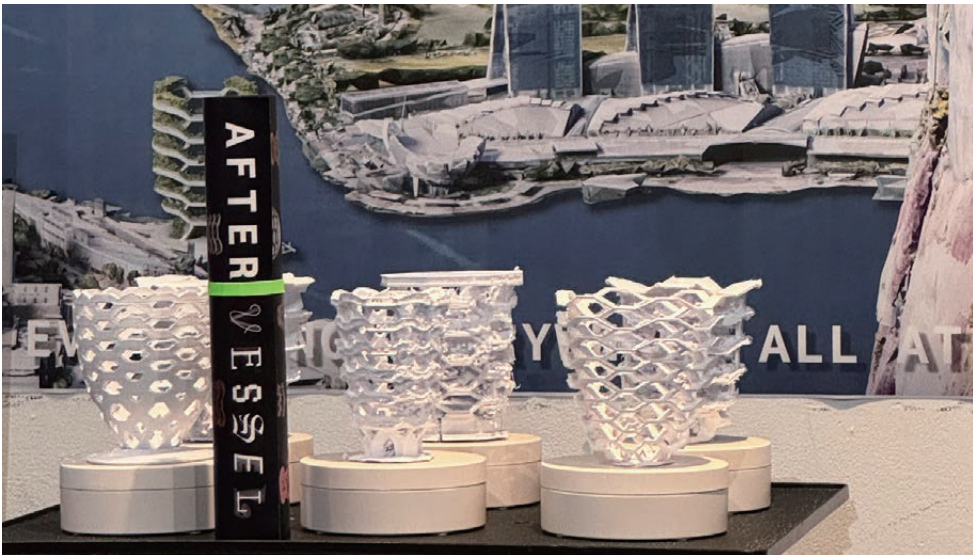


03
ALL AT ONCE
AFTER THE VESSEL

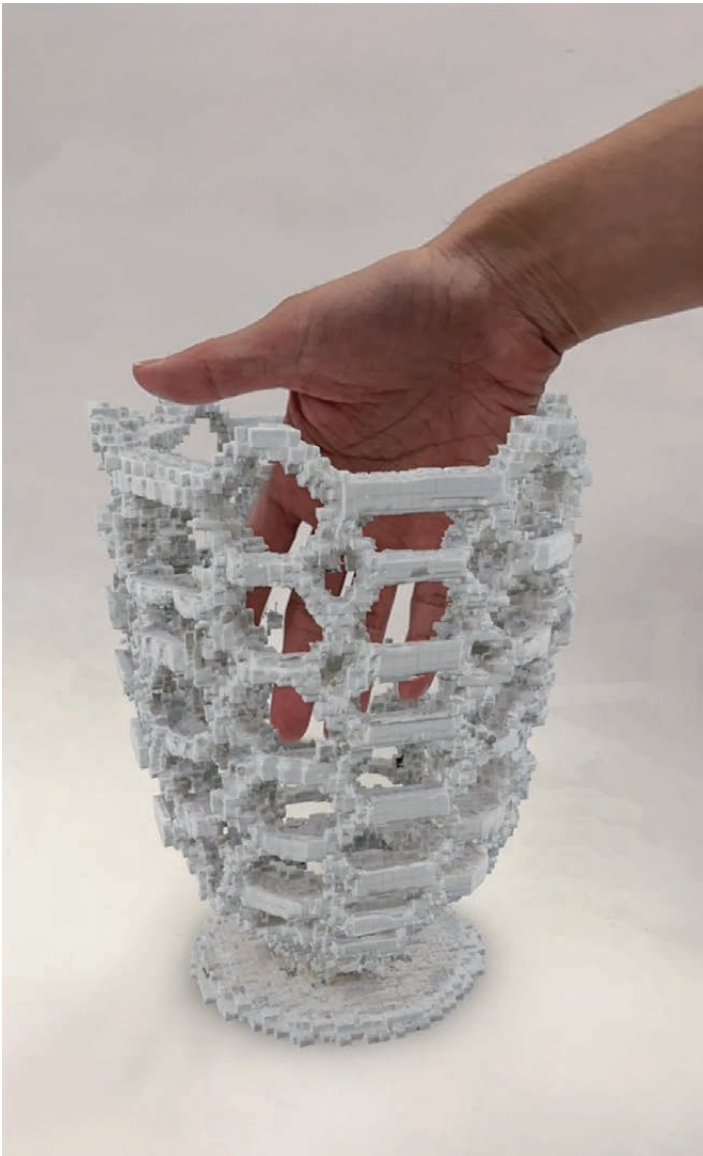
The project extends digital mutations of the Vessel into physical models, exhibition formats, and public interaction.

By treating mutation as a design method, representation becomes a system of translation across media, scales, and audiences.

Rather than ending with images, the work tests how architectural meaning can circulate through objects, display, and collective viewing.



From digital mutations to physical models



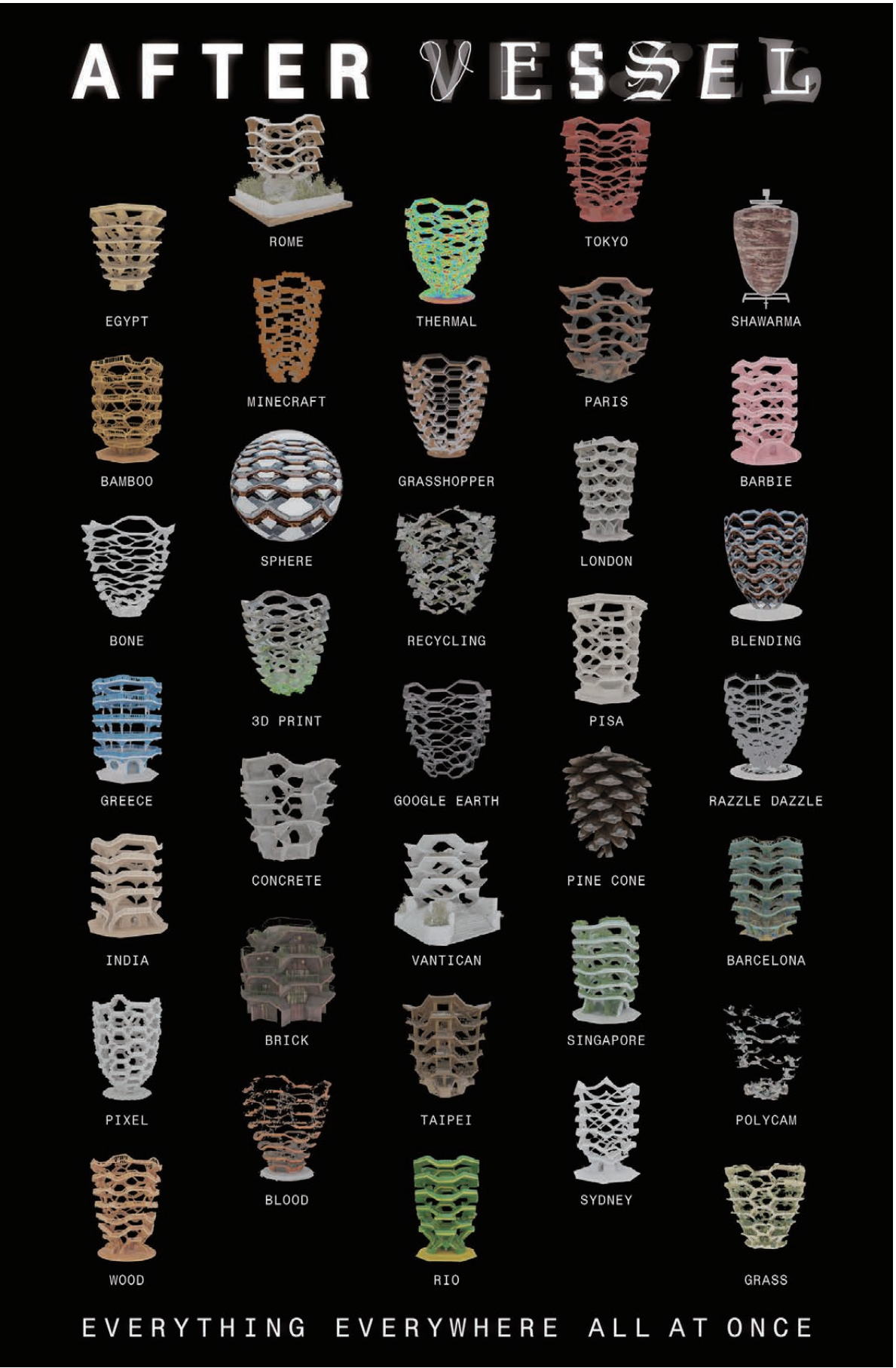
AR interaction across audiences and spaces



Project selected for final studio review



Project selected for the annual summer show





Sweettransition

From Olympic Legacy to Carbon Sink

2025 Fall Studio

Instructor: David Benjamin
TA: Deniz Mahir Dagtekin
Team: Guan-Yi Siao, Sungjik Kim

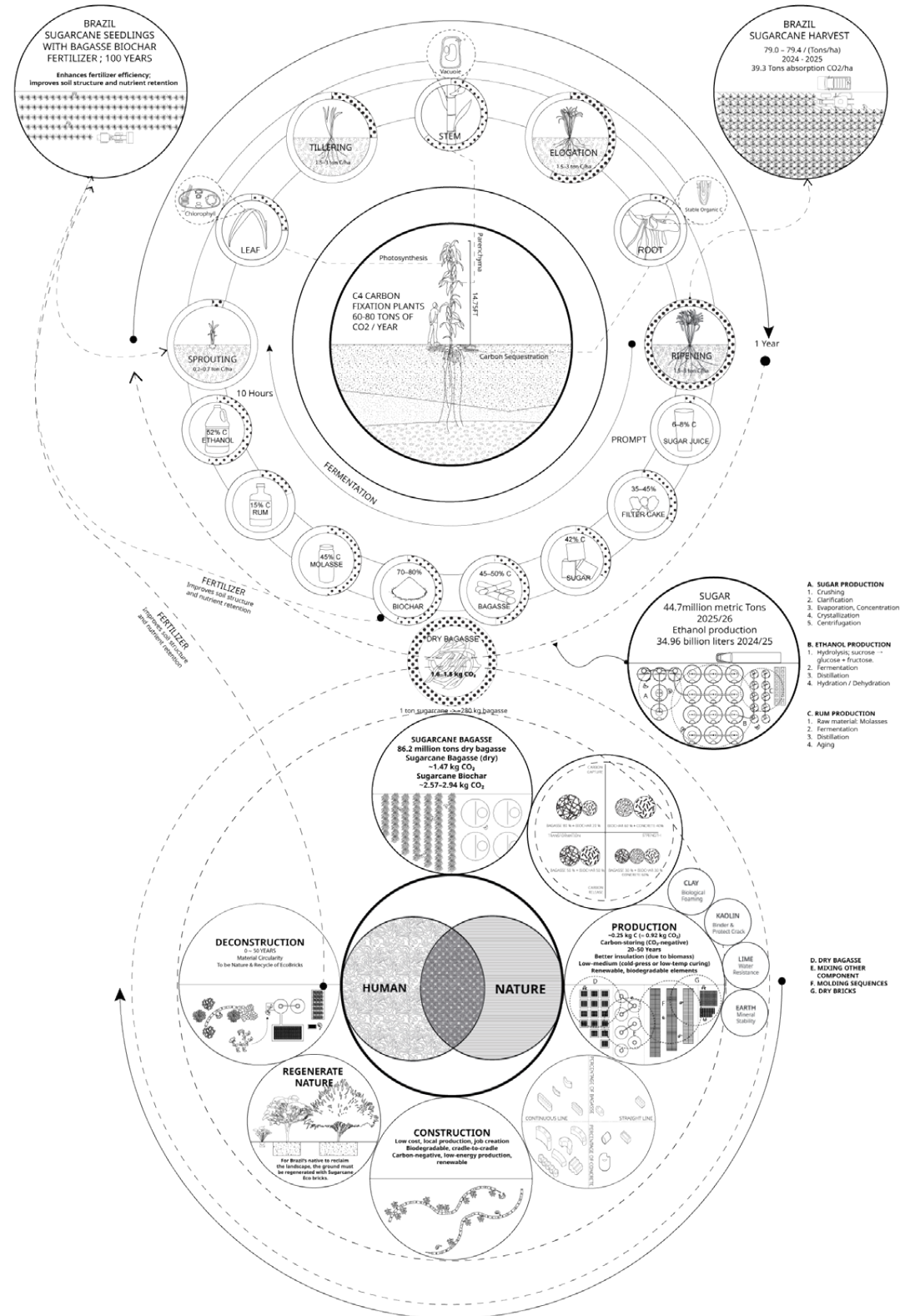
This project reimagines Barra Olympic Park in Rio de Janeiro as a regenerative carbon-sink landscape. By transforming an underused Olympic tennis stadium into a micro-factory and public garden, the project turns Brazil's sugarcane bagasse into carbon-storing bio-bricks.

Rather than treating Olympic legacy, waste, and ecological recovery as separate issues, the project connects material production, public participation, and landscape regrowth into one phased system. Over time, the stadium becomes both a civic infrastructure and a living carbon sink.



From Agricultural Waste to Carbon Material

Sugarcane bagasse is transformed into carbon-storing bio-bricks, turning agricultural waste into a regenerative landscape material.





02

Testing Sugarcane Bagasse Bio-Bricks

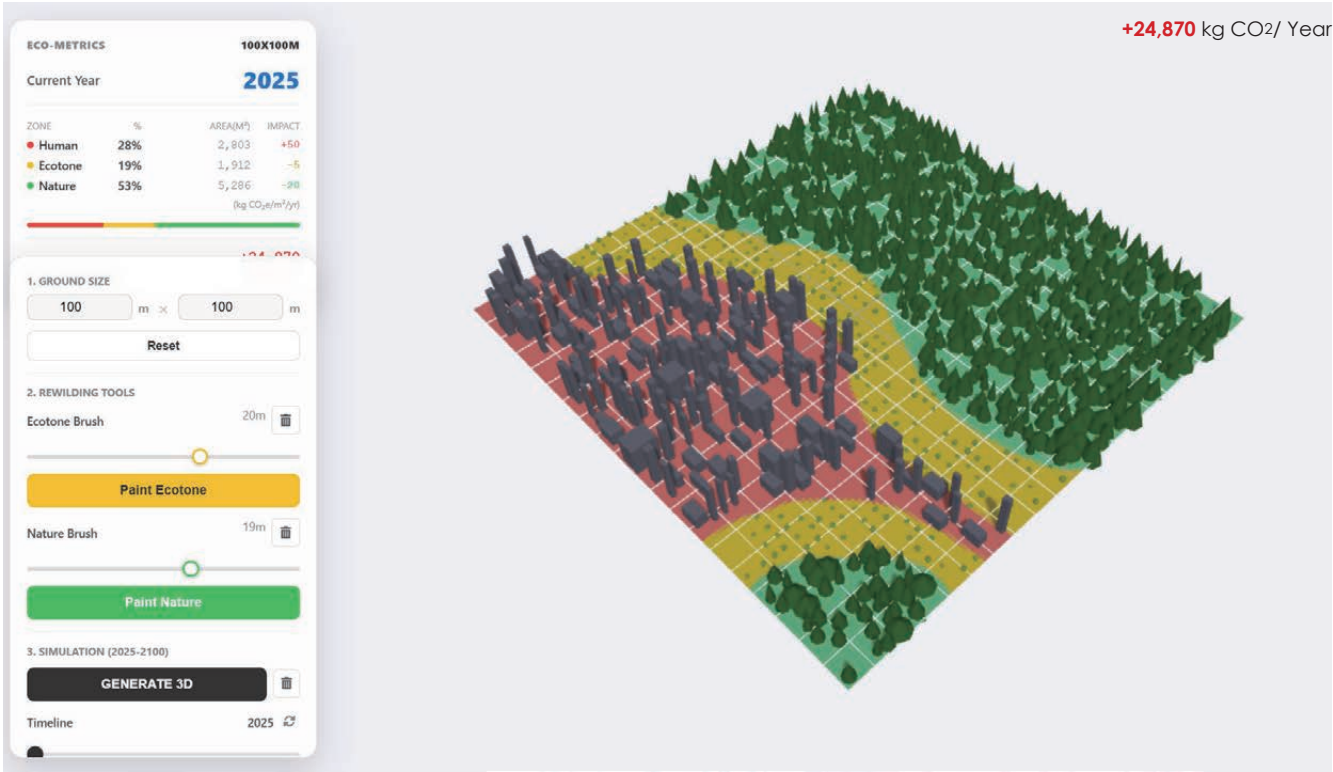
Casting, drying, planting, and regrowth tests reveal how material decay can support vegetation and ecological recovery.



03

Simulating Carbon-Sequestration Ratios with AI

AI-assisted simulations study how the balance between people, transition, and nature affects carbon sequestration over time.



2035

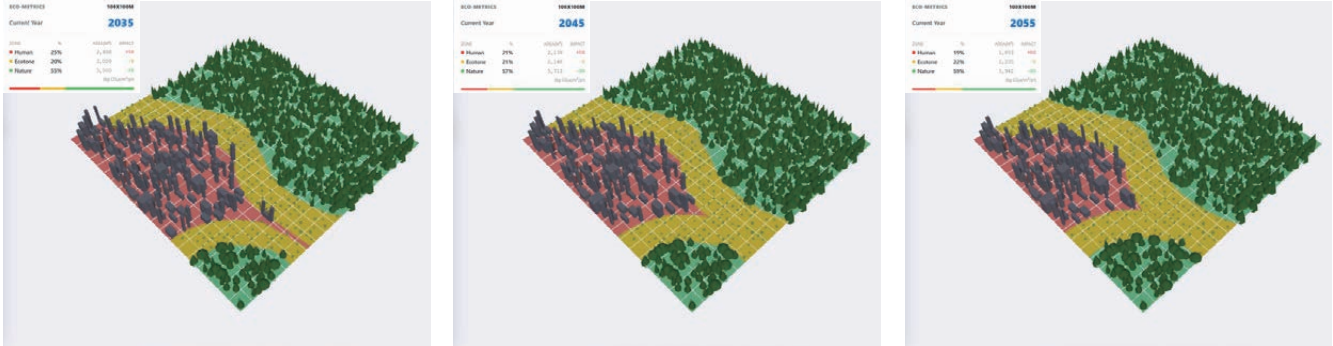
+3,055 kg CO₂/ Year

2045

-18,050 kg CO₂/ Year

2055

-37,215 kg CO₂/ Year



2065

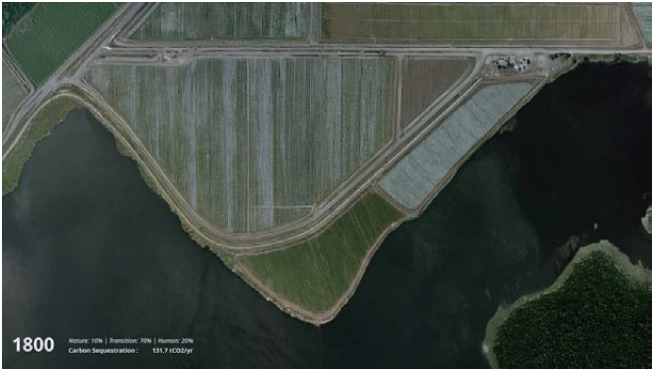
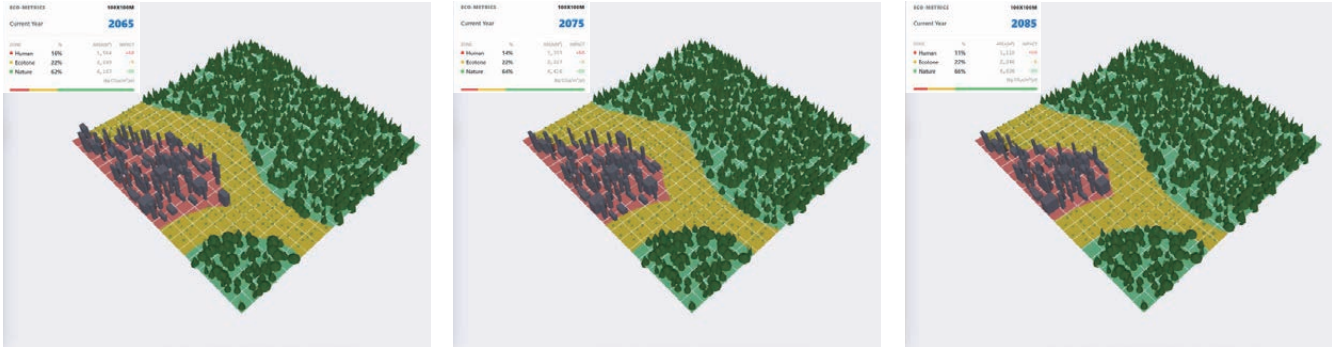
-55,385 kg CO₂/ Year

2075

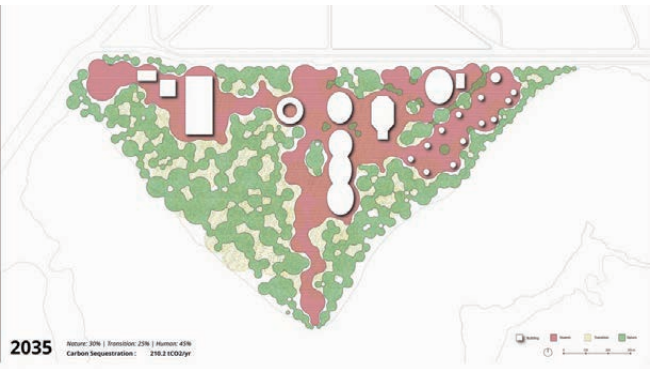
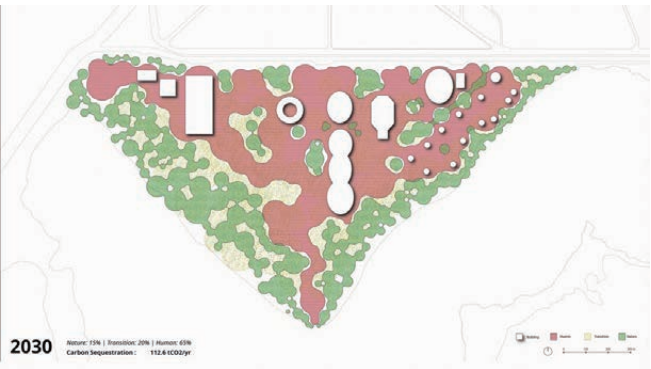
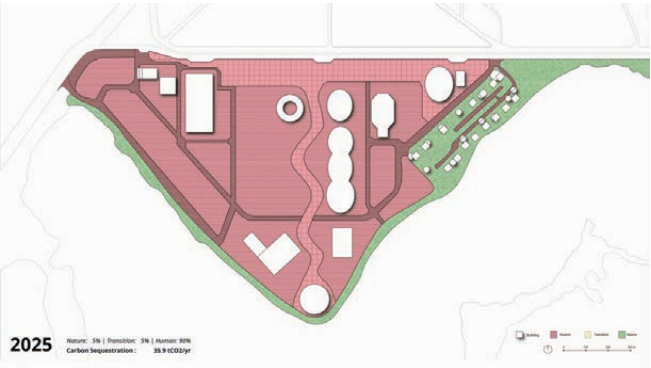
-71,605 kg CO₂/ Year

2085

-88,050 kg CO₂/ Year



"+440 t CO₂/year sequestered after 20 years"



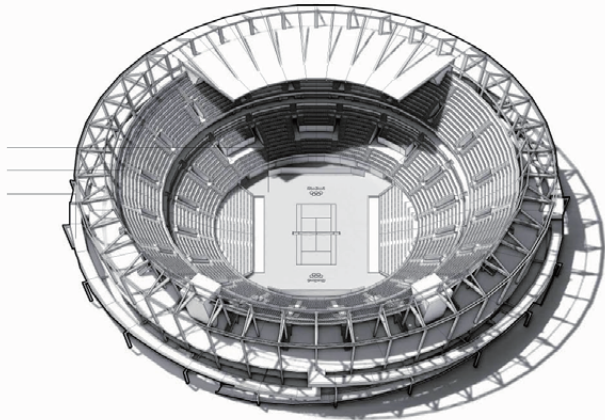
04

Deconstructing and Transforming the Stadium

The Olympic tennis stadium is gradually deconstructed and reused as a framework for production, planting, and public access.

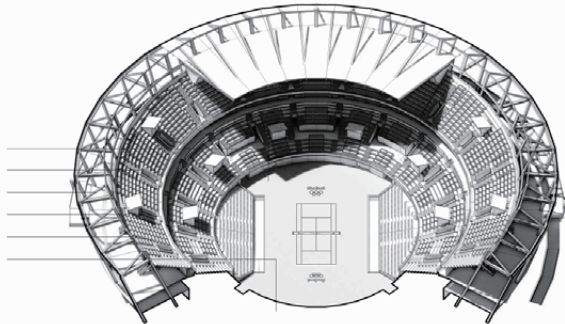
2016
Olympic Stadium

A. Tennis Court
B. Seating Area
C. Circulation Ramp



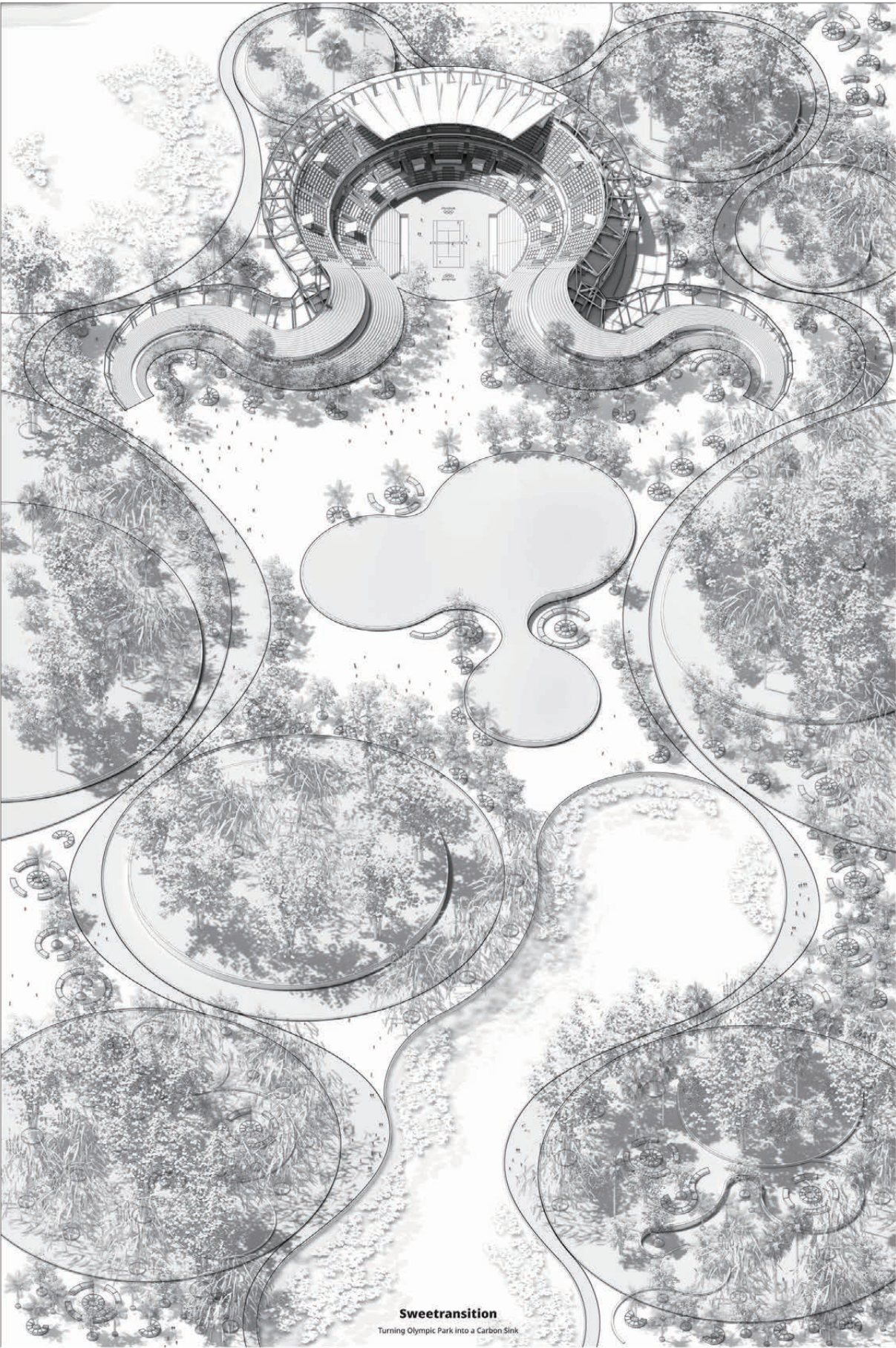
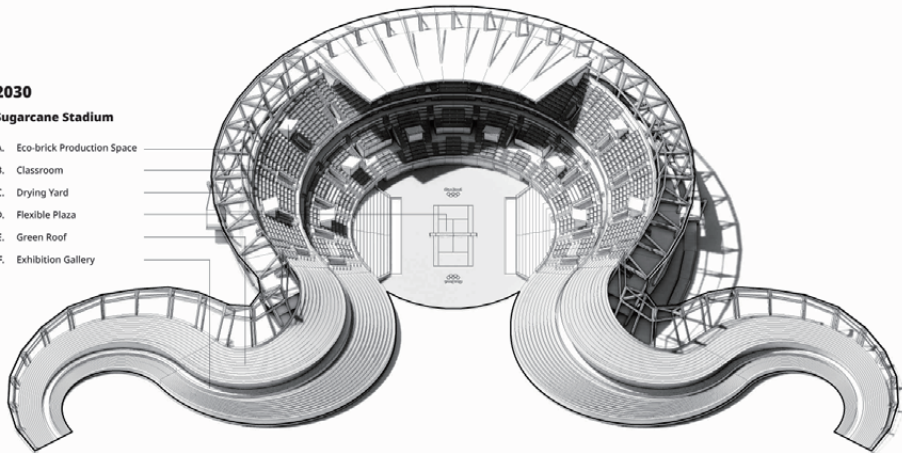
2025
Transition Stadium

A. Tennis Court
B. Seating Area
C. Eco-brick Production Space
D. Classroom
E. Drying Yard
F. Flexible Plaza



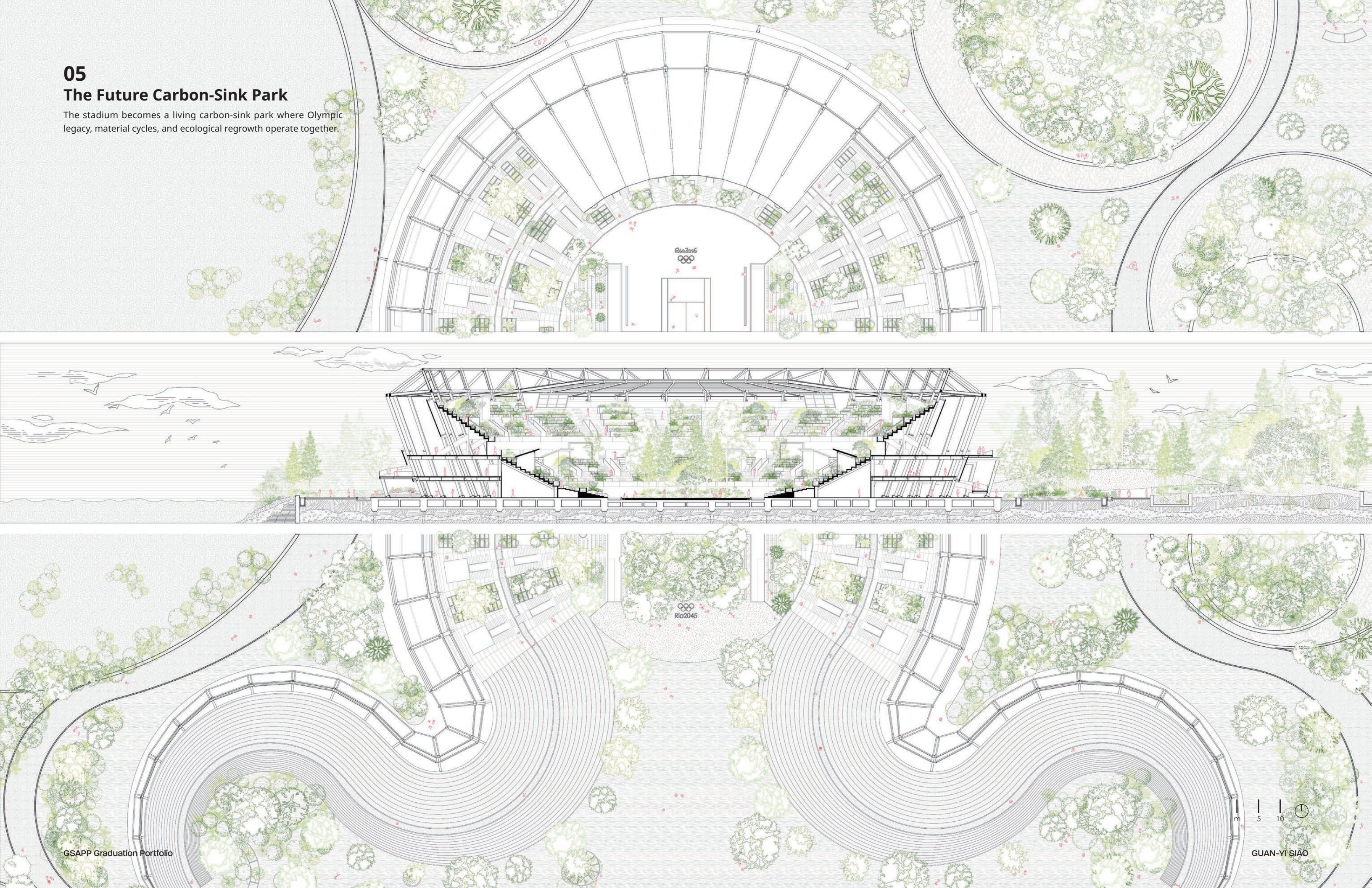
2030
Sugarcane Stadium

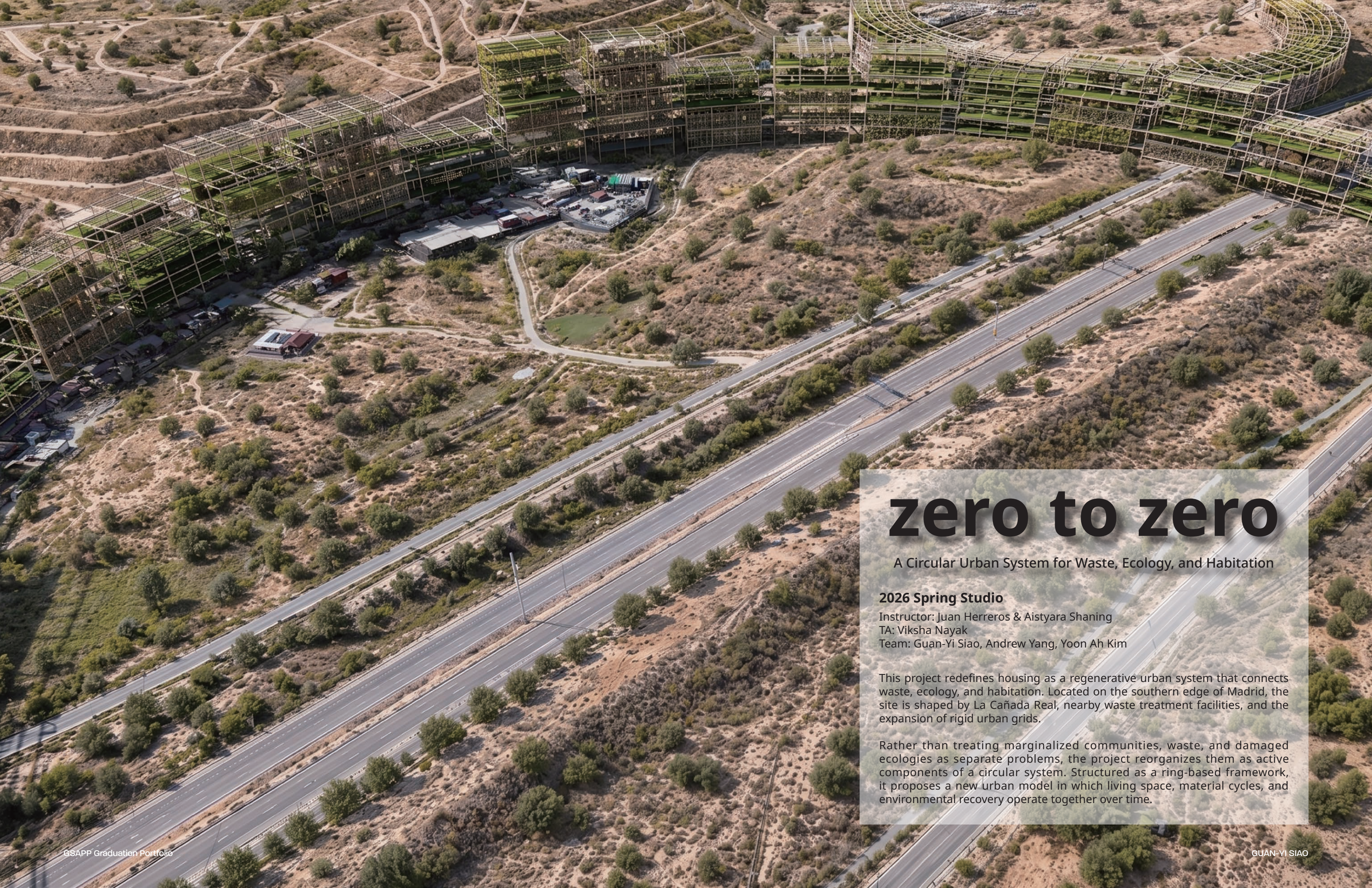
A. Eco-brick Production Space
B. Classroom
C. Drying Yard
D. Flexible Plaza
E. Green Roof
F. Exhibition Gallery



05
The Future Carbon-Sink Park

The stadium becomes a living carbon-sink park where Olympic legacy, material cycles, and ecological regrowth operate together.





zero to zero

A Circular Urban System for Waste, Ecology, and Habitation

2026 Spring Studio

Instructor: Juan Herreros & Aistyara Shaning

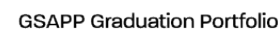
TA: Viksha Nayak

Team: Guan-Yi Siao, Andrew Yang, Yoon Ah Kim

This project redefines housing as a regenerative urban system that connects waste, ecology, and habitation. Located on the southern edge of Madrid, the site is shaped by La Cañada Real, nearby waste treatment facilities, and the expansion of rigid urban grids.

Rather than treating marginalized communities, waste, and damaged ecologies as separate problems, the project reorganizes them as active components of a circular system. Structured as a ring-based framework, it proposes a new urban model in which living space, material cycles, and environmental recovery operate together over time.

Sector 6 is one of the most precarious areas, where electricity has been cut off since 2020, exposing residents to extreme climatic conditions.

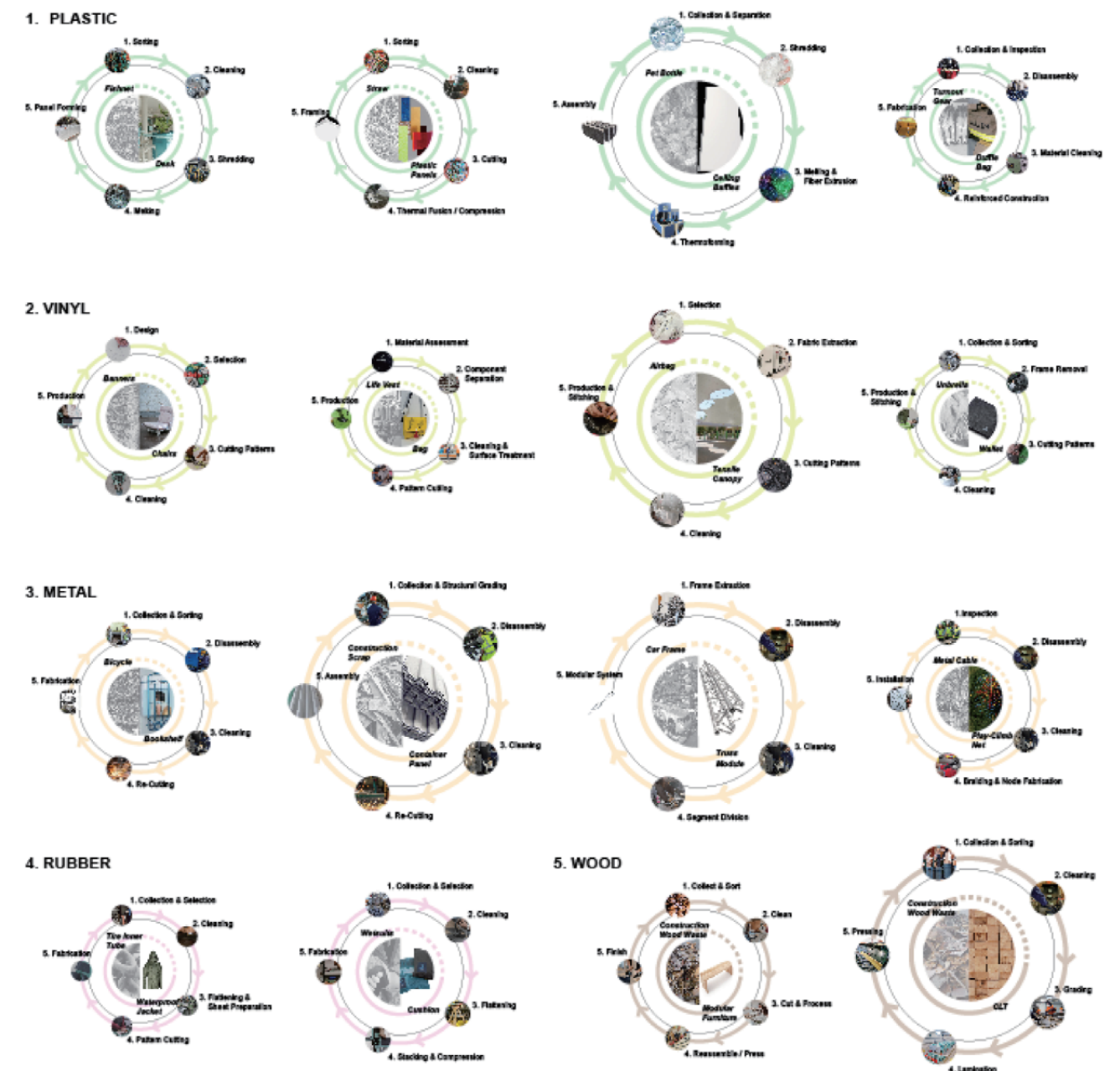


GUAN-YI SIAO

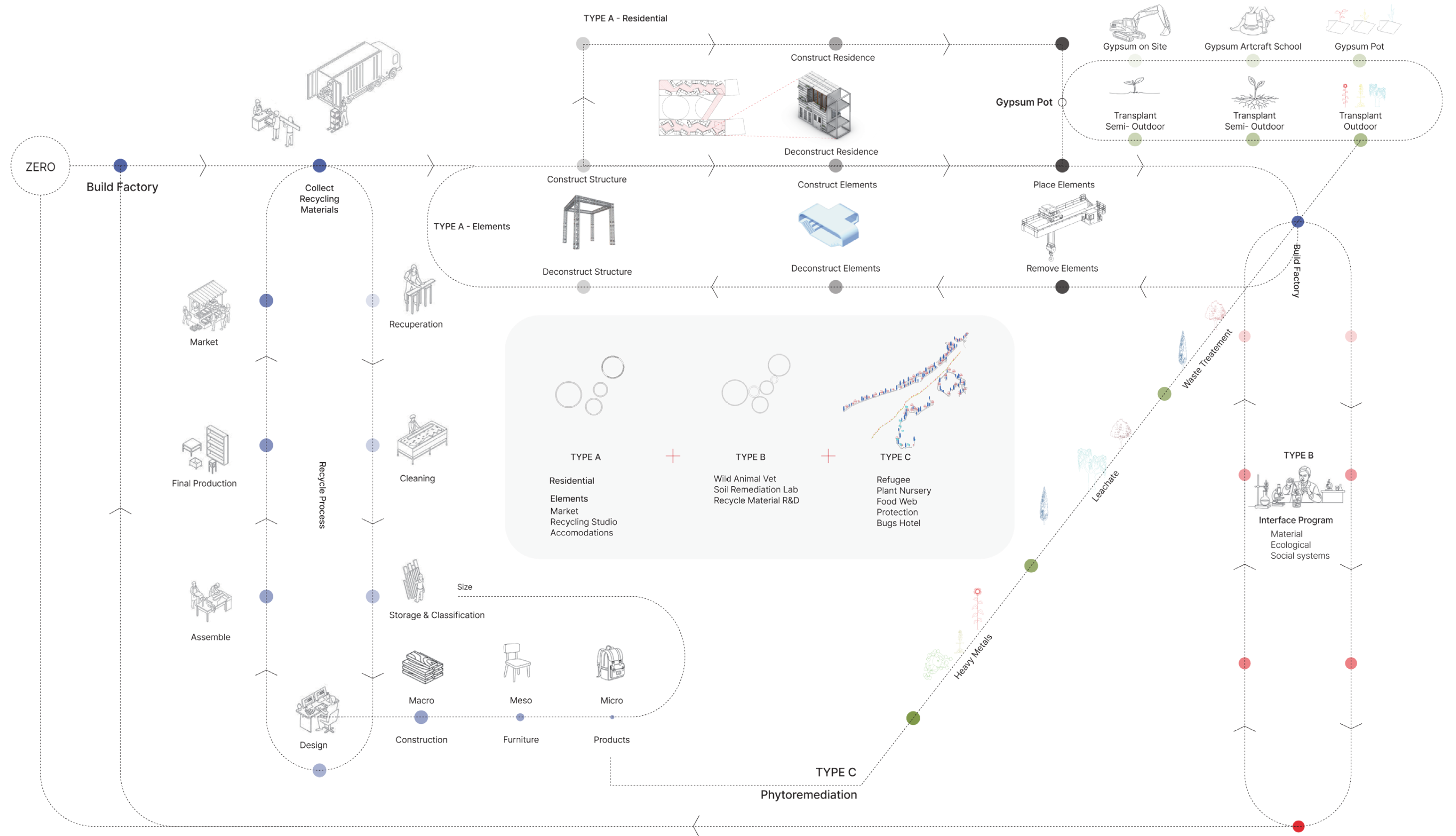
At the city's edge, formal development, informal settlement, infrastructure, and ecology collide, revealing the limits of conventional urban growth.



The material loop supports housing, public programs, and ecological repair, turning waste from an endpoint into a new beginning.

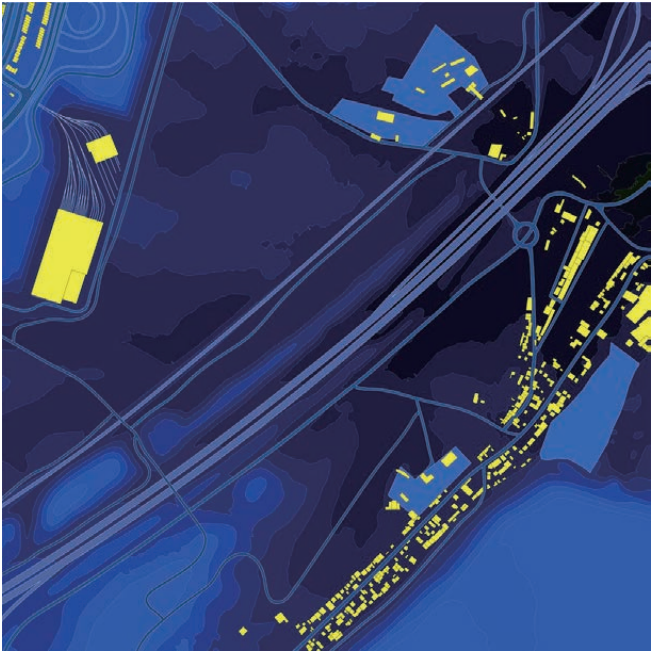


05
Zero-to-Zero Cycle

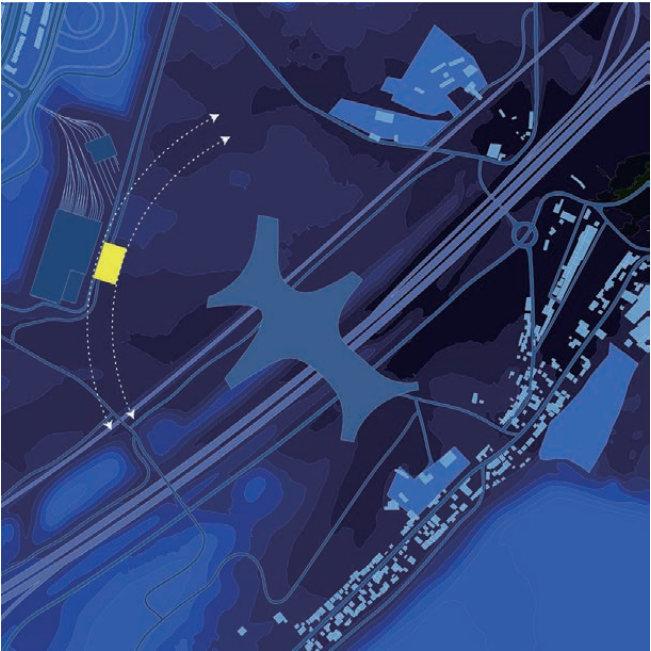


06
Growing Infrastructure

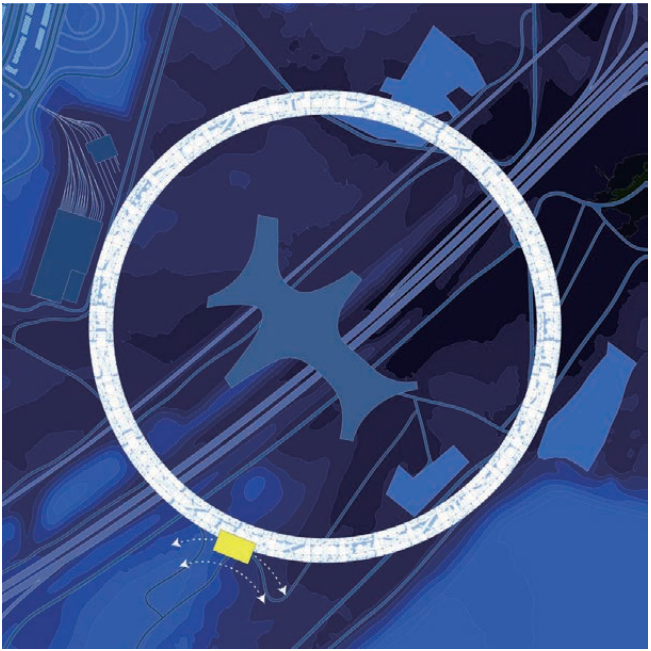
Instead of a fixed infrastructure, the project proposes a circular system that grows, moves, and transforms over time. Beginning with a recycling factory, the system converts waste into building components and expands through repeated loops of construction, relocation, and ecological repair.



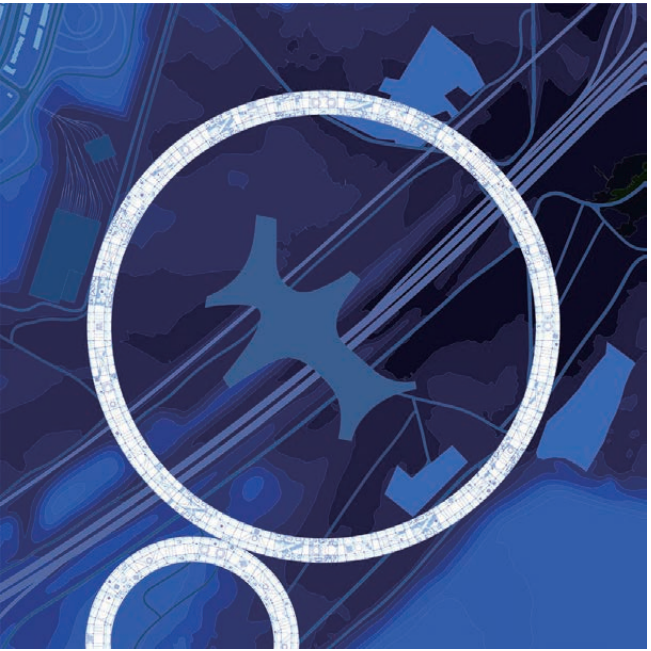
Infrastructure separates the formal city from its marginalized edge.



Waste is transformed into building components through the recycling factory.



Each completed loop becomes the starting point for the next.

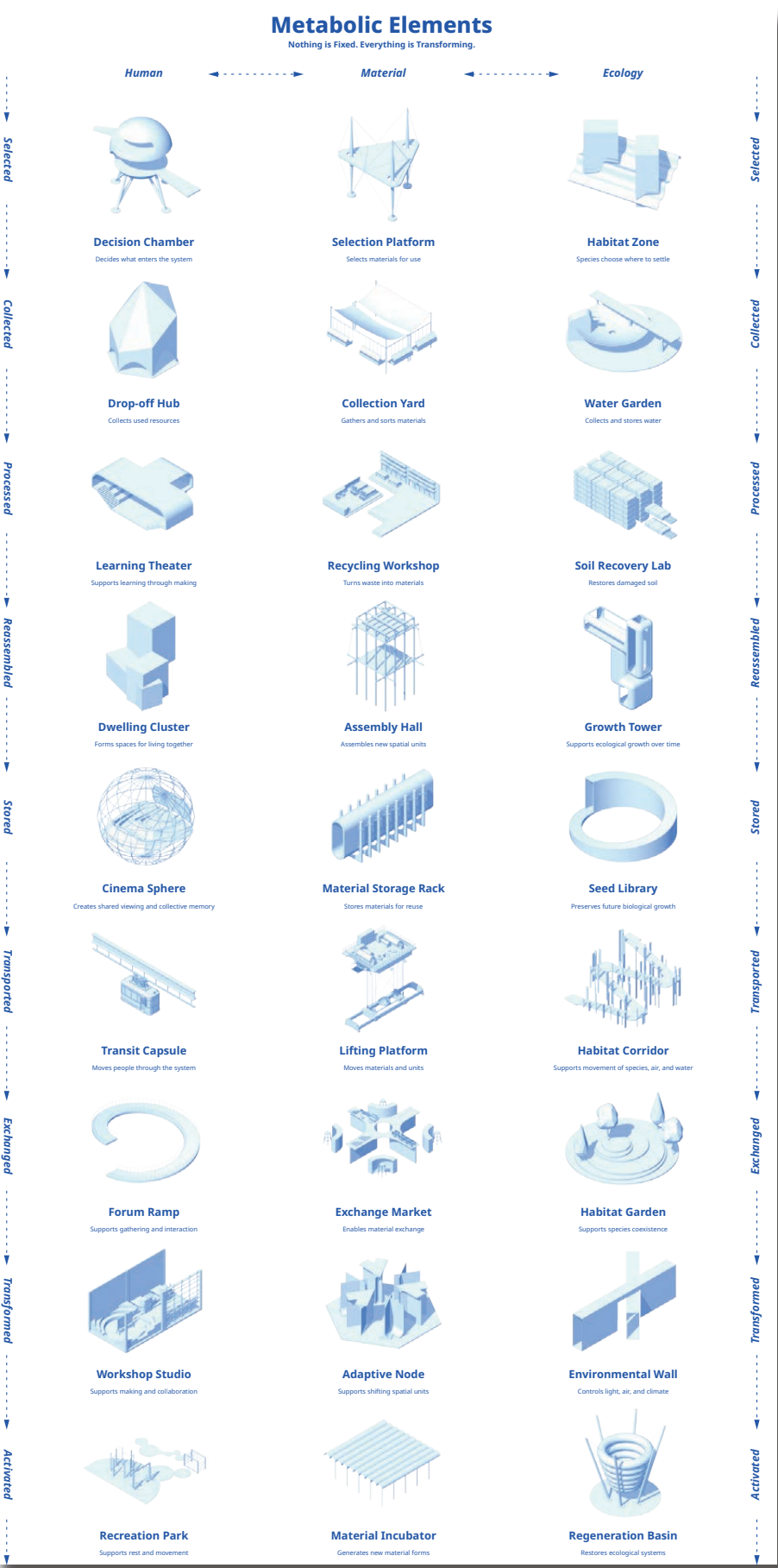


The system grows through housing, public space, markets, and ecological repair.

07
Metabolic Elements

Flexible elements are inserted, moved, replaced, and transformed within the loop.

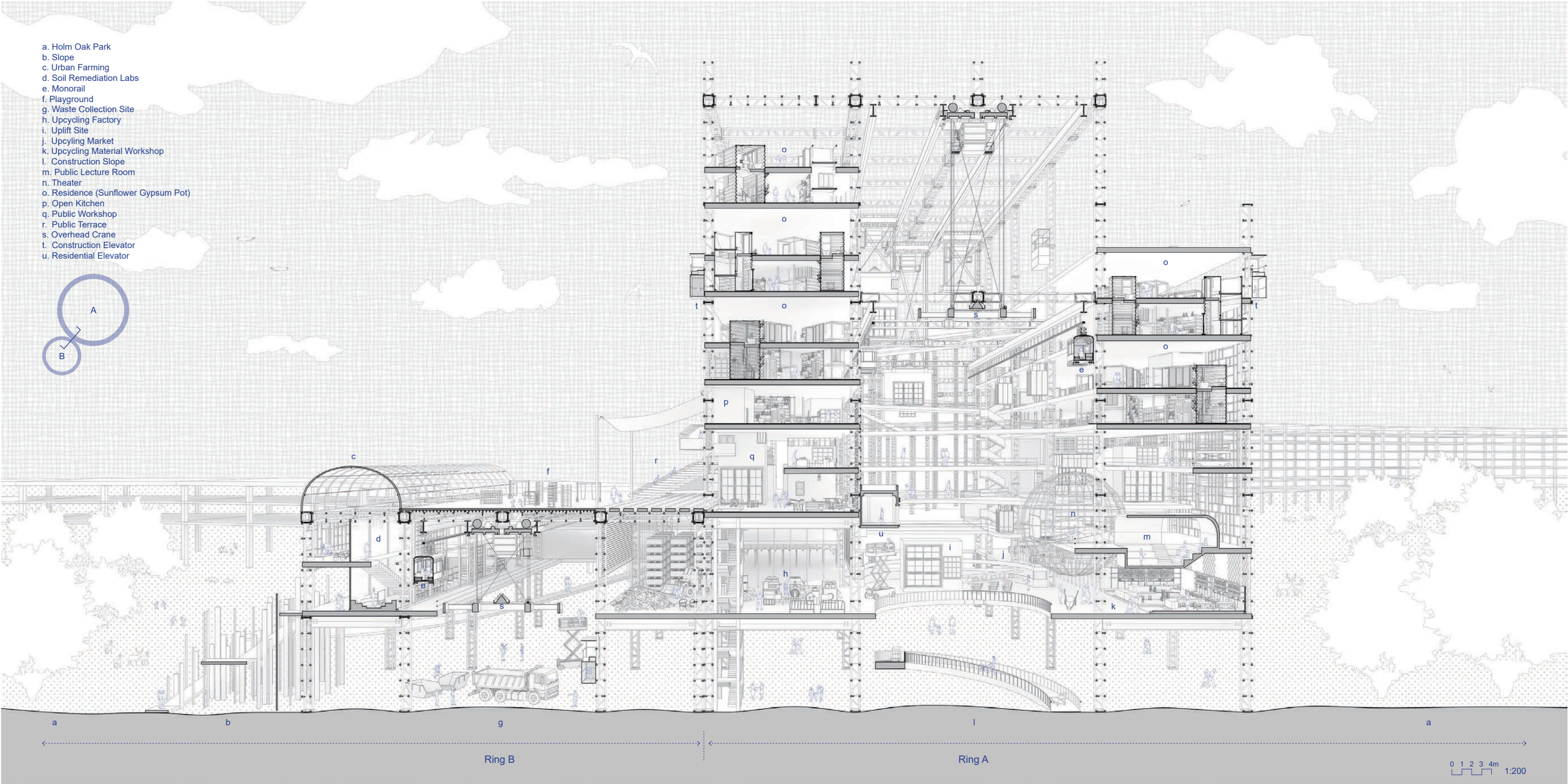
They connect human habitation, material production, and ecological repair, allowing the infrastructure to grow as an adaptive urban system.



08
Living Infrastructure

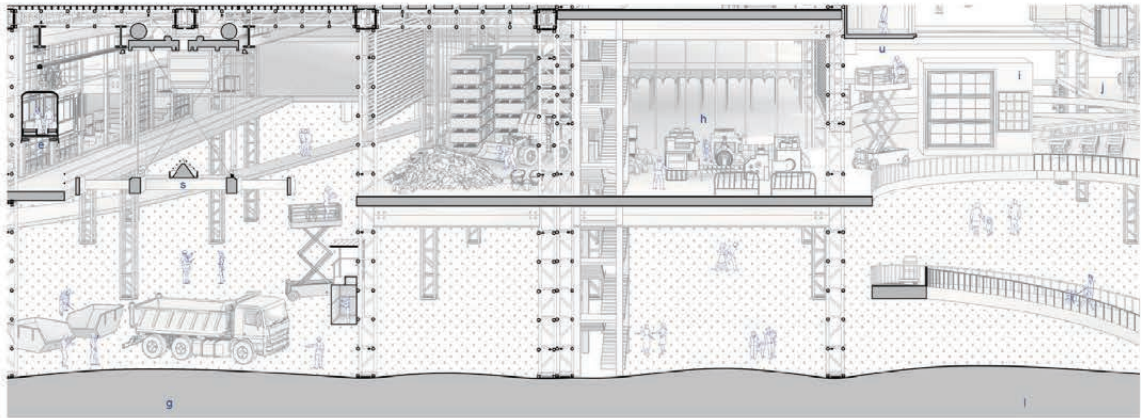
The loop becomes an inhabitable infrastructure for housing, production, public space, and ecological repair.

It operates as a changing system that can be built, occupied, dismantled, and rebuilt over time.



Upcycling Factory

At the ground level, upcycling workshops and markets allow residents to produce, exchange, and sell furniture, façade panels, and other material products.



Overhead Crane + Monorail

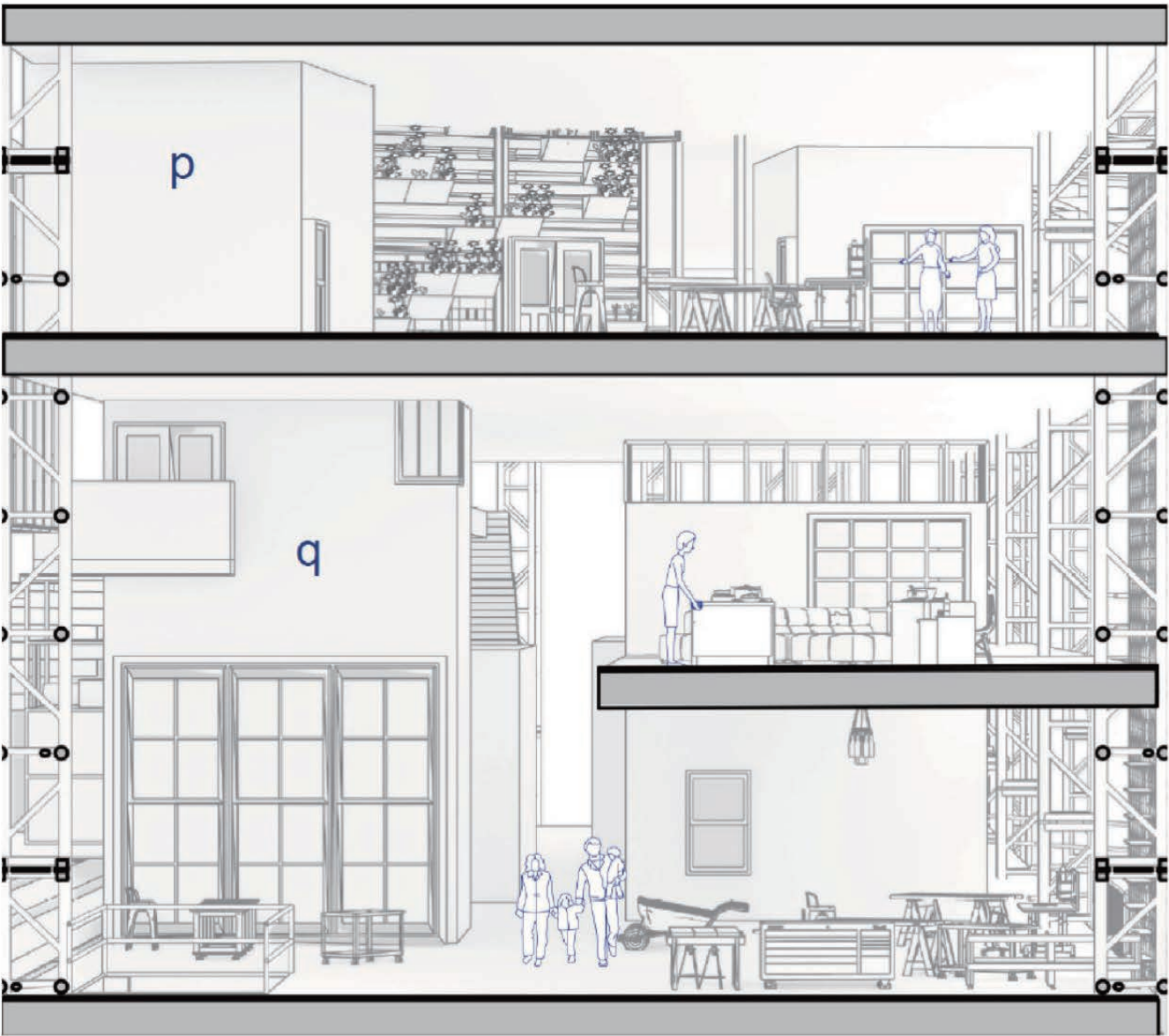
The central void supports crane operation, allowing units and materials to circulate across the ring.

Monorails connect the residential levels and enable movement throughout the entire system.

Common Area

Residential levels include shared kitchens, open workplaces, and green corridors.

All materials are produced through the upcycling system.



Upcycling Workshop and Market

Residents produce, exchange, and sell furniture, façade panels, and other products made from upcycled materials.



09 Residential Unit System

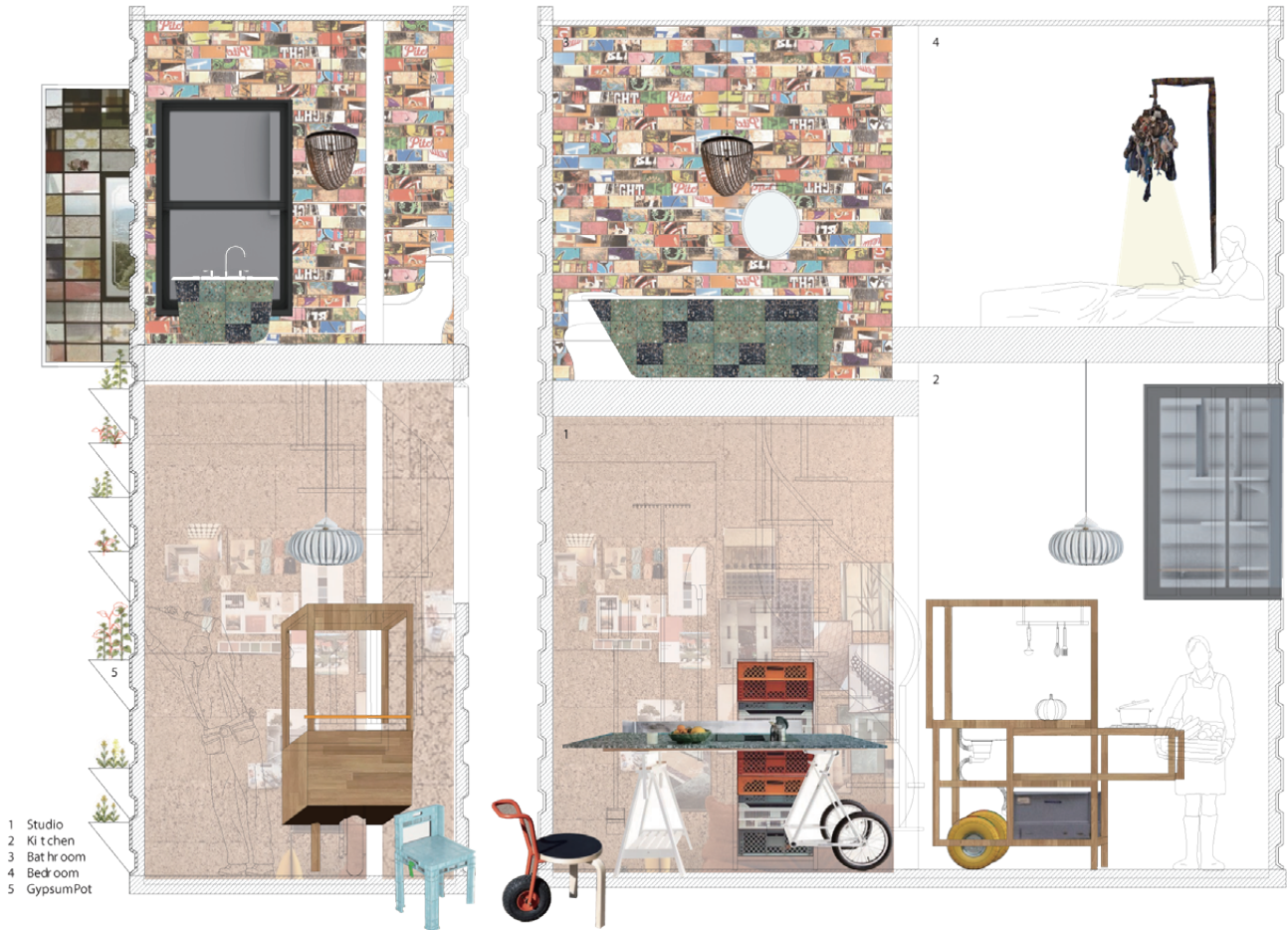
Residential units occupy the upper level of Type A. Each unit is built from stacked shipping containers and upcycled materials, creating a flexible dwelling system within the loop.

Windows, doors, façade panels, and planting components are reclaimed and reused. The unit can be inserted, removed, or adapted as the infrastructure grows over time.



Each unit is organized across two levels. The lower level accommodates workshops, kitchens, and shared production areas, while the upper level contains bedrooms and bathrooms.

Daily life is structured around making, repairing, planting, and living. Through the connection between workspaces, shared corridors, and plant cultivation, the housing system becomes both a domestic space and a small-scale material ecosystem.





Zero to Zero

The project does not end as a fixed master plan. It grows through repeated cycles of collection, production, construction, occupation, and transformation.

From the first recycling factory to an expanding ring infrastructure, the system turns waste into living space, ecological repair, and new forms of urban coexistence.