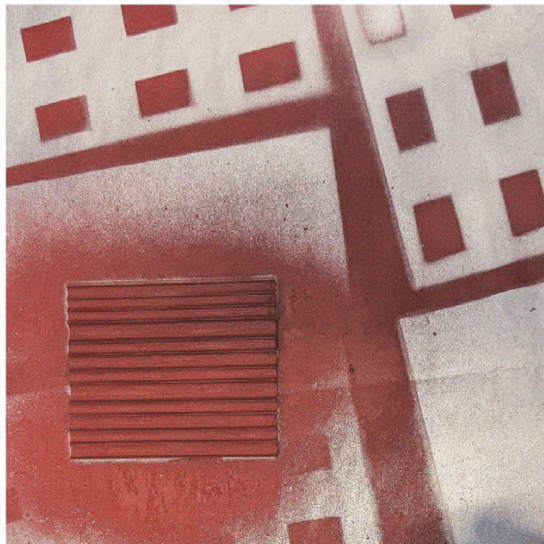




sofia paniagua posca

Columbia GSAPP

MSAAD 2026

Architecture begins with questions of shelter and ends with questions of care. The work gathered here attempts to hold both: protection that remains porous, structure that accommodates agency, and precision that creates space for contingency. Across scales — from courtyard typologies to microbial ecologies, from housing as social infrastructure to mycelium as inhabitant — the projects share a concern for what architecture supports and what it allows to operate beyond its control. Materials participate; they have requirements, agencies, temporalities. Maintenance becomes the work itself. The question becomes: what conditions does architecture create, and what other forces does it invite to shape the outcome? This work does not claim resolution. It proposes frameworks, practices care as ongoing attention, and remains deliberately incomplete. The projects are specific in what they attend to and open in what they leave unspecified, oriented toward what buildings might host, enable, and sustain over time.

Entre Esquinas

A New Grammar for Collective Housing

Summer 2025. AAD Advanced Studio
Studio Critic: Neeraj Bhatia. With Julio Viejo. 04

Holobiont Futures

Living with Mycelium as Urban Infrastructure

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Cooking Architectures:

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Mycopot

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Traced Grounds

Amor Mundi; Ishigaki, Japan

Spring 2026. Advanced Studio VI.
Studio Critics: Jing Liu & Alessandra Cianchetta. 52

Entre Esquinas

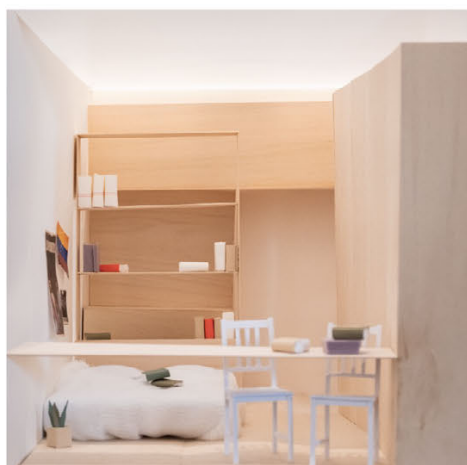
A New Grammar for Collective Housing

Summer 2025. AAD Advanced Studio

Studio Critic: Neeraj Bhatia. With Julio Viejo.

Entre Esquinas is a typological study that addresses New York City's current shortages of housing and communal amenities through a deliberate reworking of the courtyard block. Drawing on Steven Holl's "Alphabet City," it begins with the 'O,' an introverted ring valued for protection and legibility, and evolves it into a porous system of sheared 'L' forms. The operation of slicing and rotating the ring opens the court to light, air, and circulation while establishing direct connections to the street and adjacent parcels. The result is a model that is protective yet connected: an introverted core that deliberately engages the extroverted city. Designed with immigrant communities in mind, the building frames housing as both shelter and social infrastructure. Kitchens are positioned at the courtyard edge as primary sites of congregation, recognizing food as a universal practice that reduces isolation and supports cultural continuity. The program is organized across three scales of sharing: room pairs that share a bathroom, clusters that share micro-kitchens and dining, and building-wide amenities strategically clustered at sheared corners. These nodes concentrate activity and extend it outward through "leaky" terraces and patios, allowing interior life to register in the public realm. At the urban scale, the project relies on reciprocity. It is pushed to the property line and dimensioned to interlock with future neighbors, amplifying courtyards rather than blocking them. Structural reciprocity reduces costs and enables replication across a block. In aggregate, the system becomes an urban instrument that improves quality of life proportionate to residents' contribution to the city. It is, fundamentally, a catalyst for collective assimilation, one that is protected yet plugged-in.





1:10
the room



1:250
formal exploration



1:100
the cluster



1:50
the unit



1:200
reciprocity



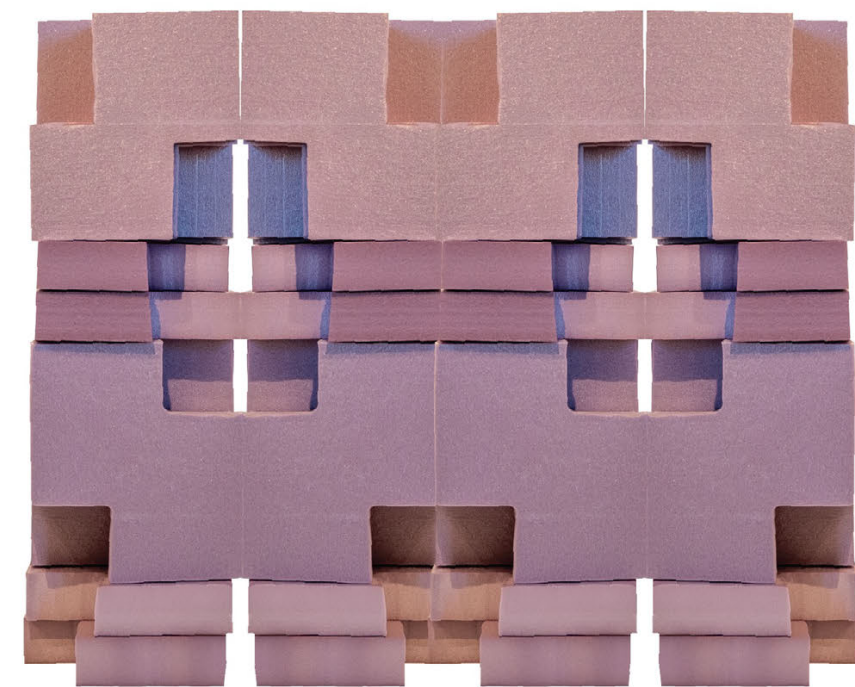
room exploration stop motion stills



the room 1:10
single room exploration of
different interpretations of
the private space



formal exploration 1:250
initial massing models stemming
from critiques of traditional typologies



reciprocity 1:200
develop a vocabulary that finds
new forms of reciprocity between lots



the cluster 1:100
arrangement of units examining
the creation of sub-collective spaces

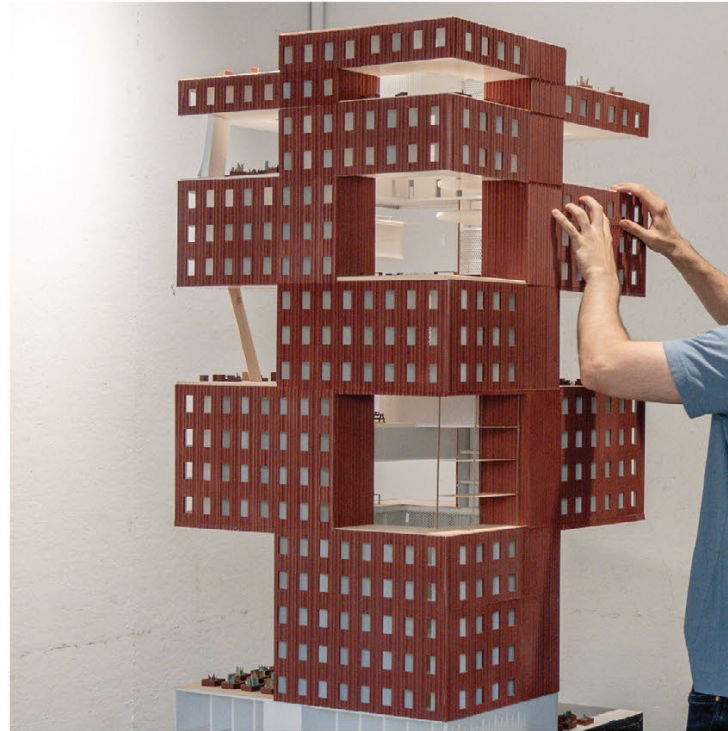
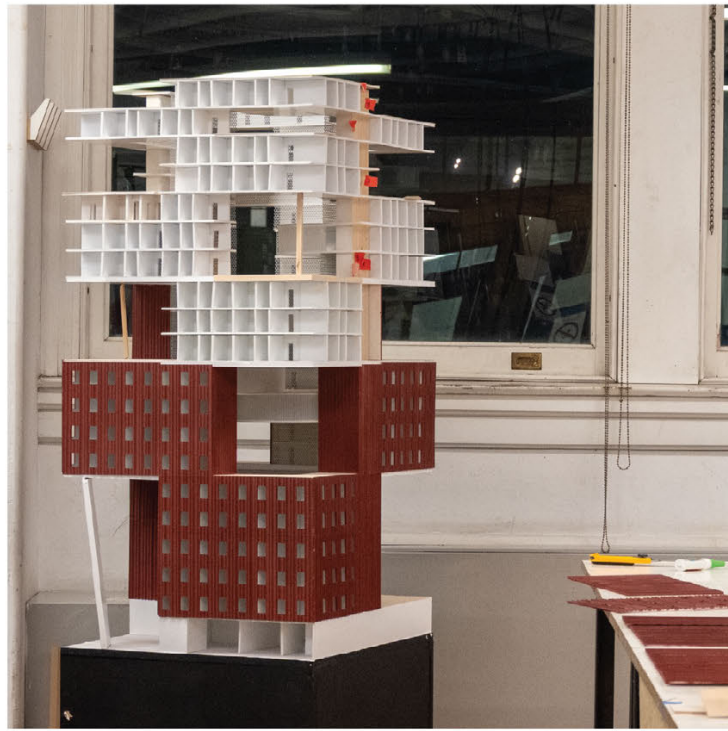




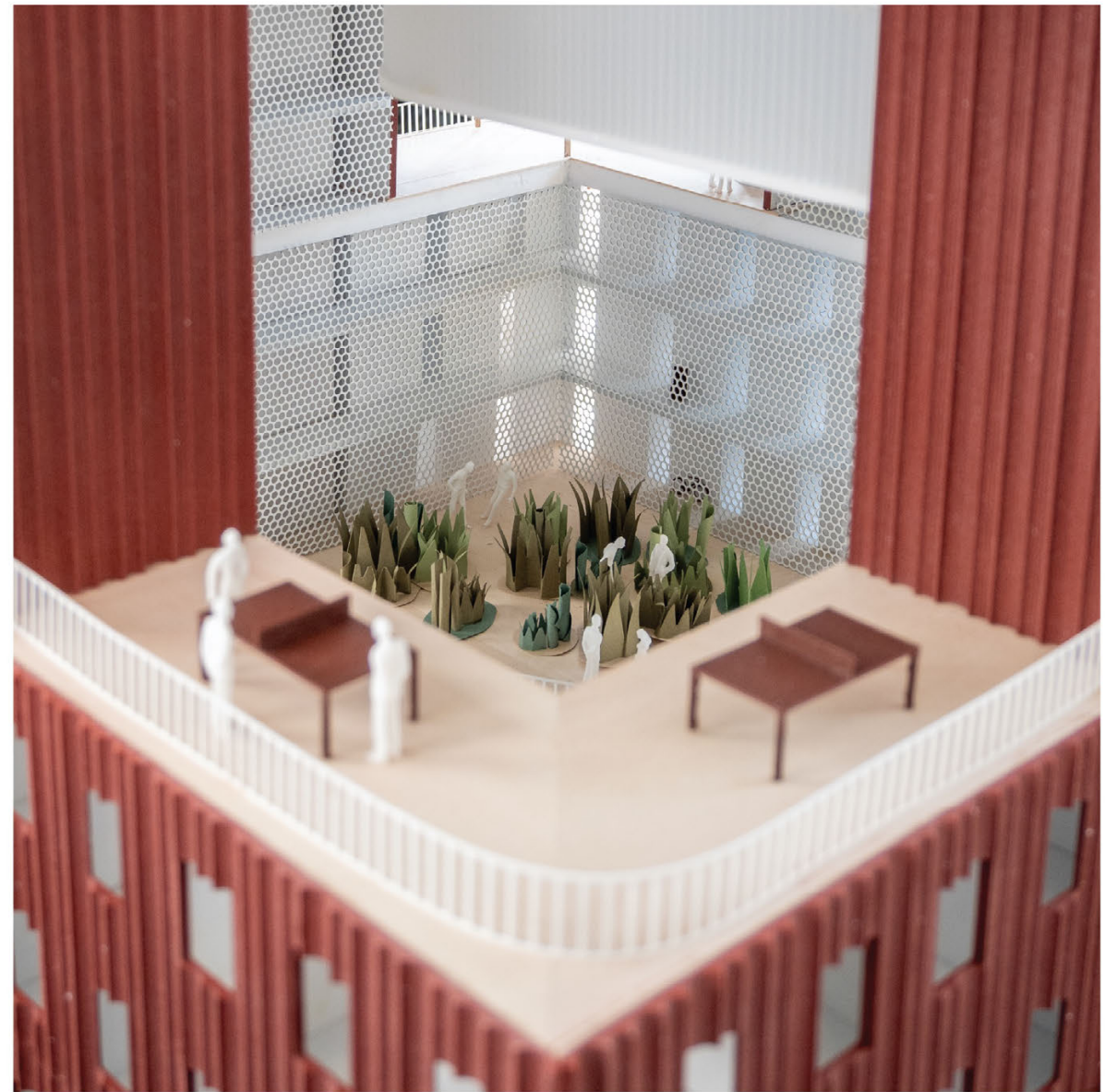
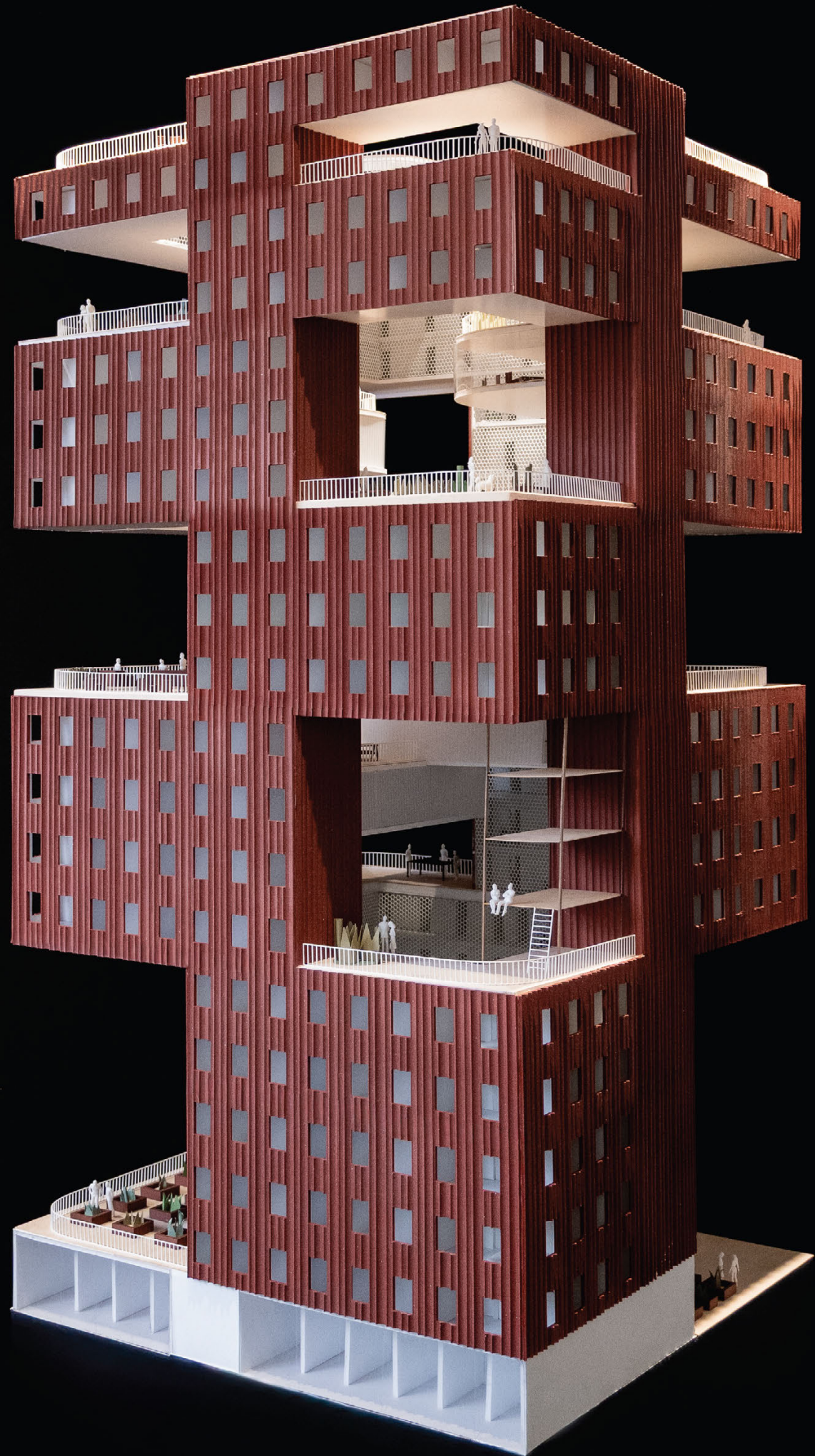
material studies

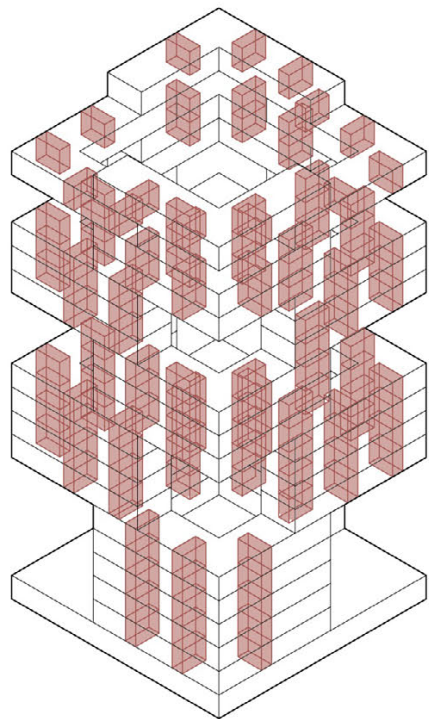
spray tests for façade panels, followed by composition with the full model to verify the interplay between surface, opacity, and the courtyard's interior gradient



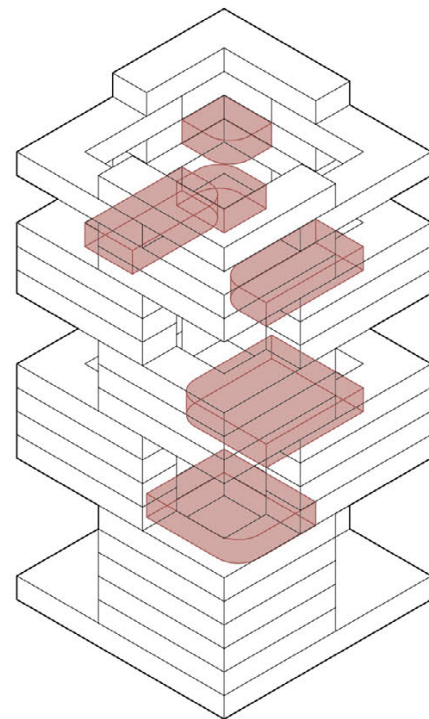


final model assembly sequence 1:50
structure, partitions, facade; built at six feet tall
to test material resolution and spatial legibility at scale

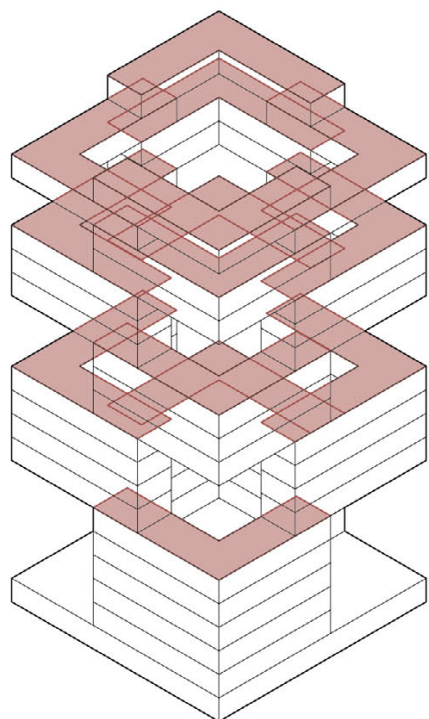




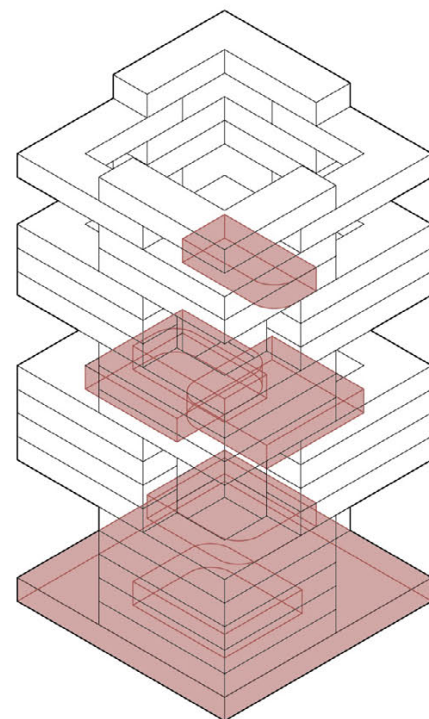
one bathroom / two units



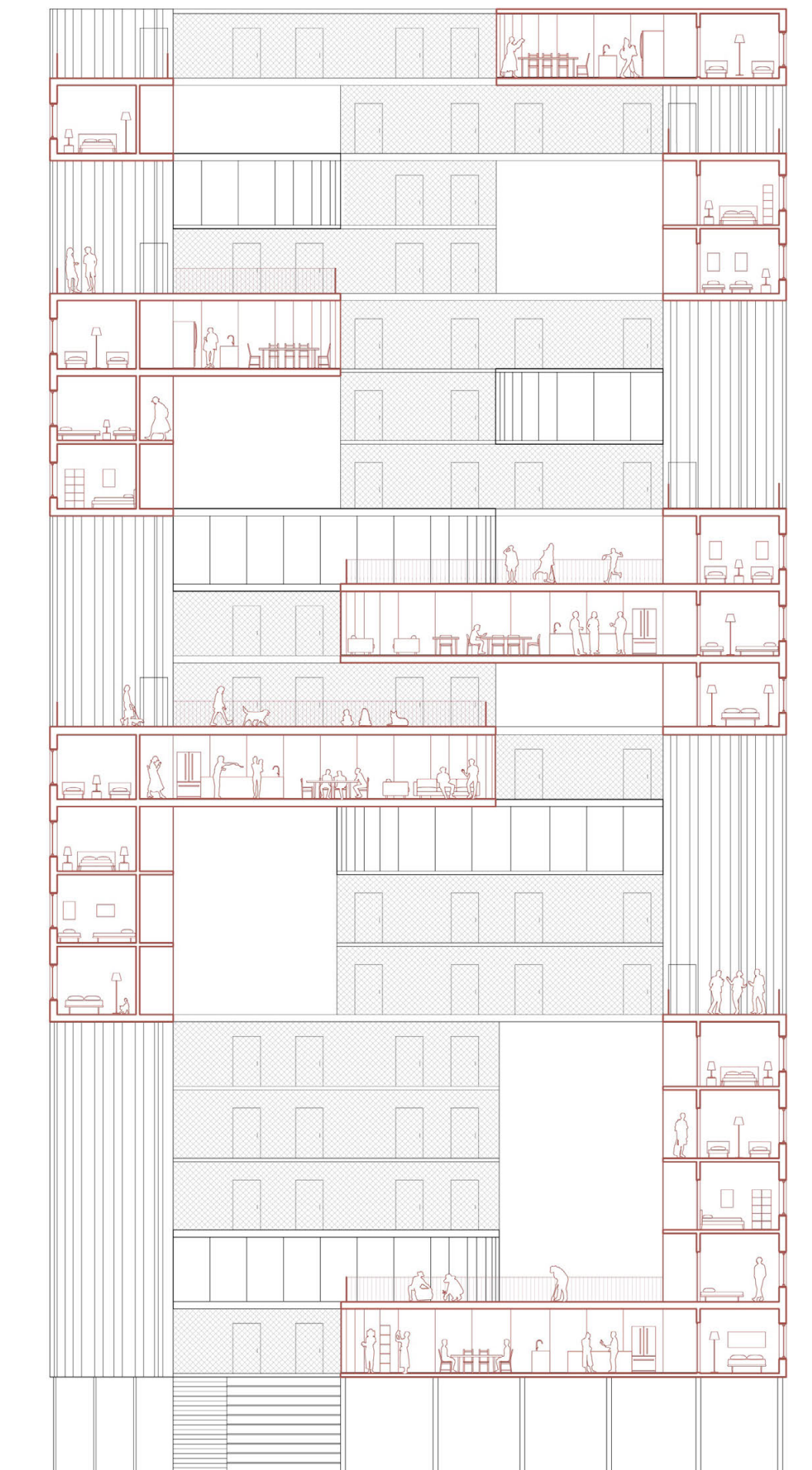
one kitchen / one cluster



two gardens / one cluster



nine luxuries / whole building





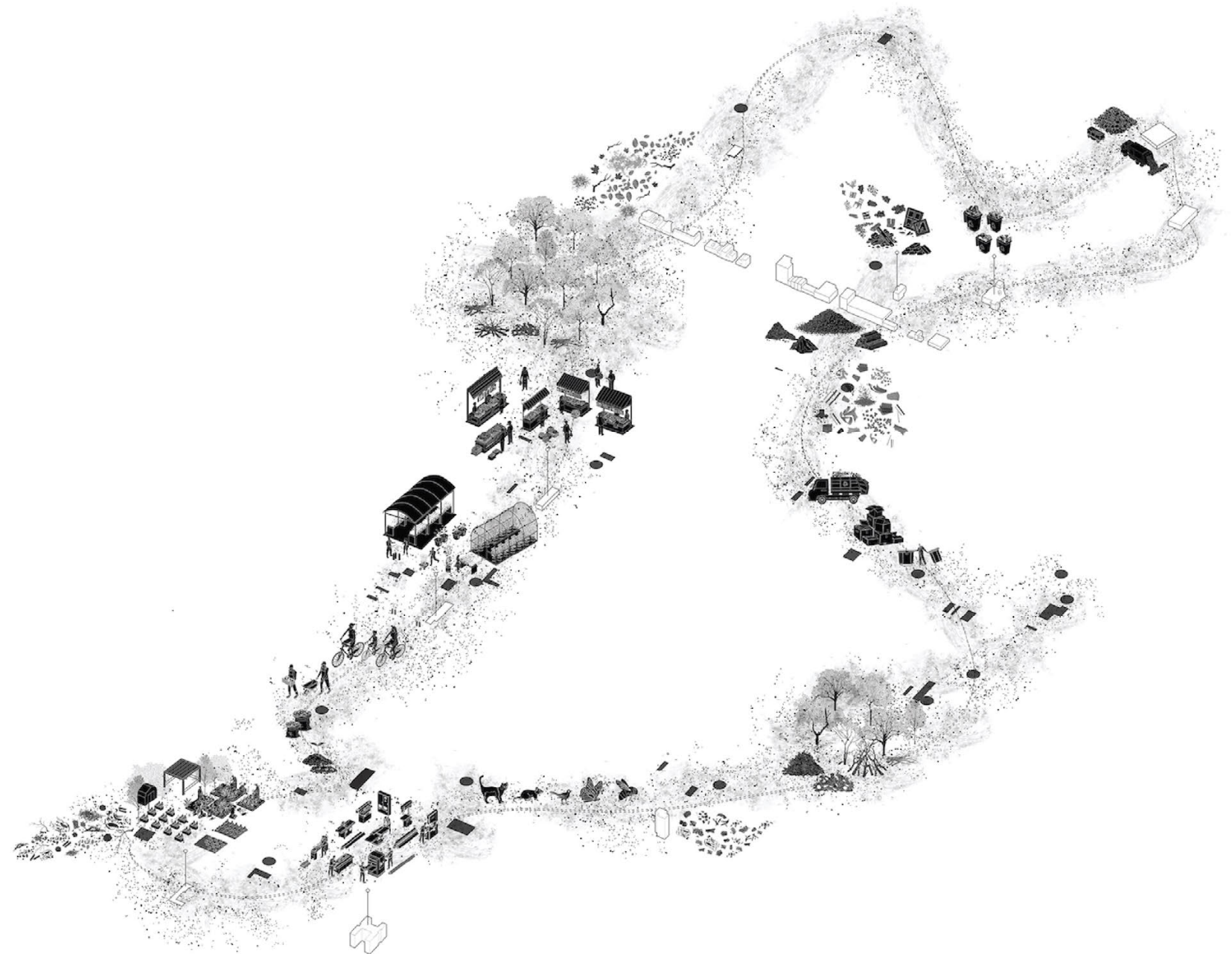
Holobiont Futures

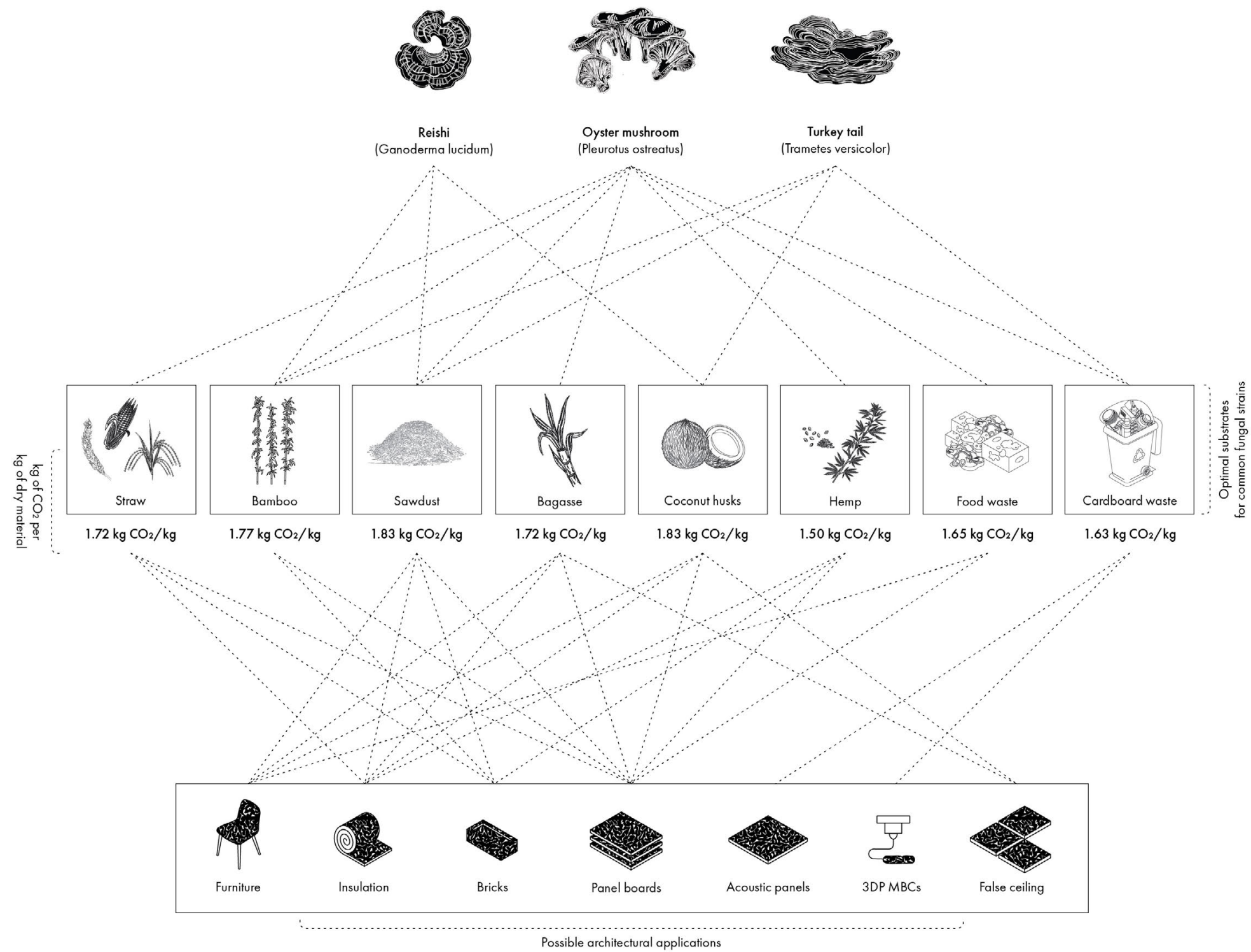
Living with Mycelium as Urban Infrastructure

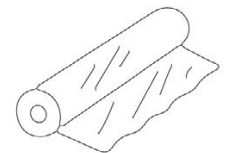
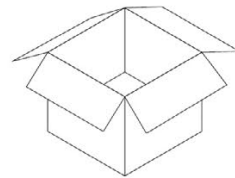
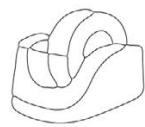
Fall 2025. Advanced Studio V.

Studio Critic: David Benjamin. With Valeria Ramírez.

Holobiont Futures is the speculative design of a transscalar circulation network that supports both widespread mycelium use as a material, as well as collective production and participation. The project imagines what the world could look like if a neighborhood started to act with a holobiont mindset. A world where people live with fungi and bacteria as everyday companions and where architecture becomes a tool, not only to scale up carbon capture, but also to improve indoor ecologies, repair cycles, and relationships with waste. Through working directly with fungi (handling waste, watching it grow, and learning to care for it), we began to see materials and habits differently. We decided to ground this exploration in East Harlem, a place shaped by strong community networks and local knowledge, and imagine how the neighborhood could adapt if living with microbes became necessary for our health and environment. From this process, we outline a small pilot made of three scales: small domestic shifts that show how our homes might change; communal mycelium kitchens placed inside community gardens, where people can bring waste, grow material, and learn together; and a repair hub where mycelium pieces can be grown again, fixed, or transformed. All three rely on existing waste streams and the idea that people themselves can lead this process, supported by mycelium, which naturally binds waste and keeps its carbon in place. More than proposing new spaces, we ask how these practices might create new encounters, new forms of care, and a different way of living with the organisms that already surround us. At its core, the project imagines a future where mycelium democratizes production and where carbon capture happens alongside something equally important: the growth of shared knowledge, ecological rituals, and a more caring, multispecies urban culture.







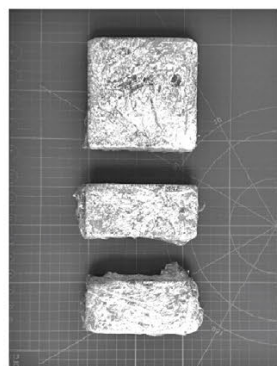
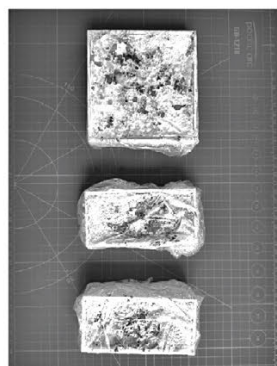
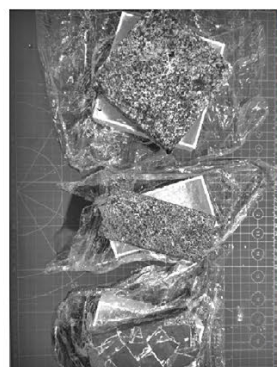
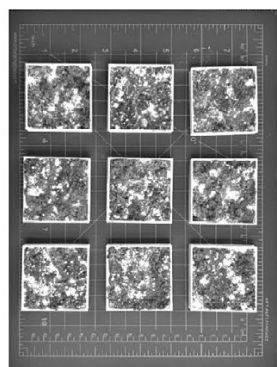
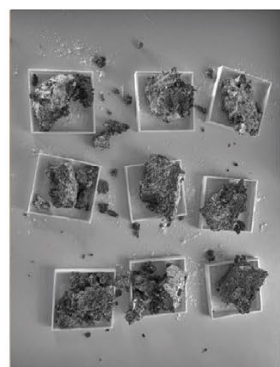
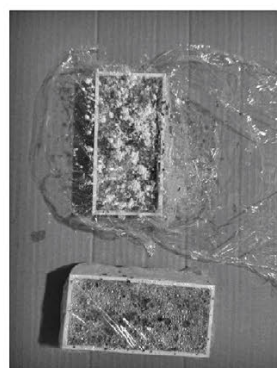
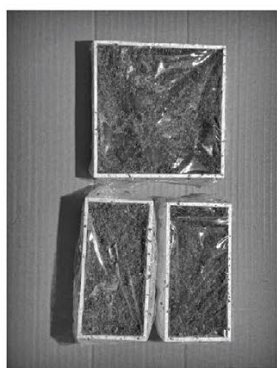
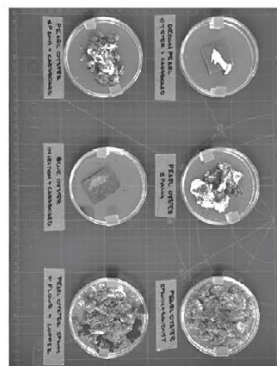


day 1

day 3

day 5

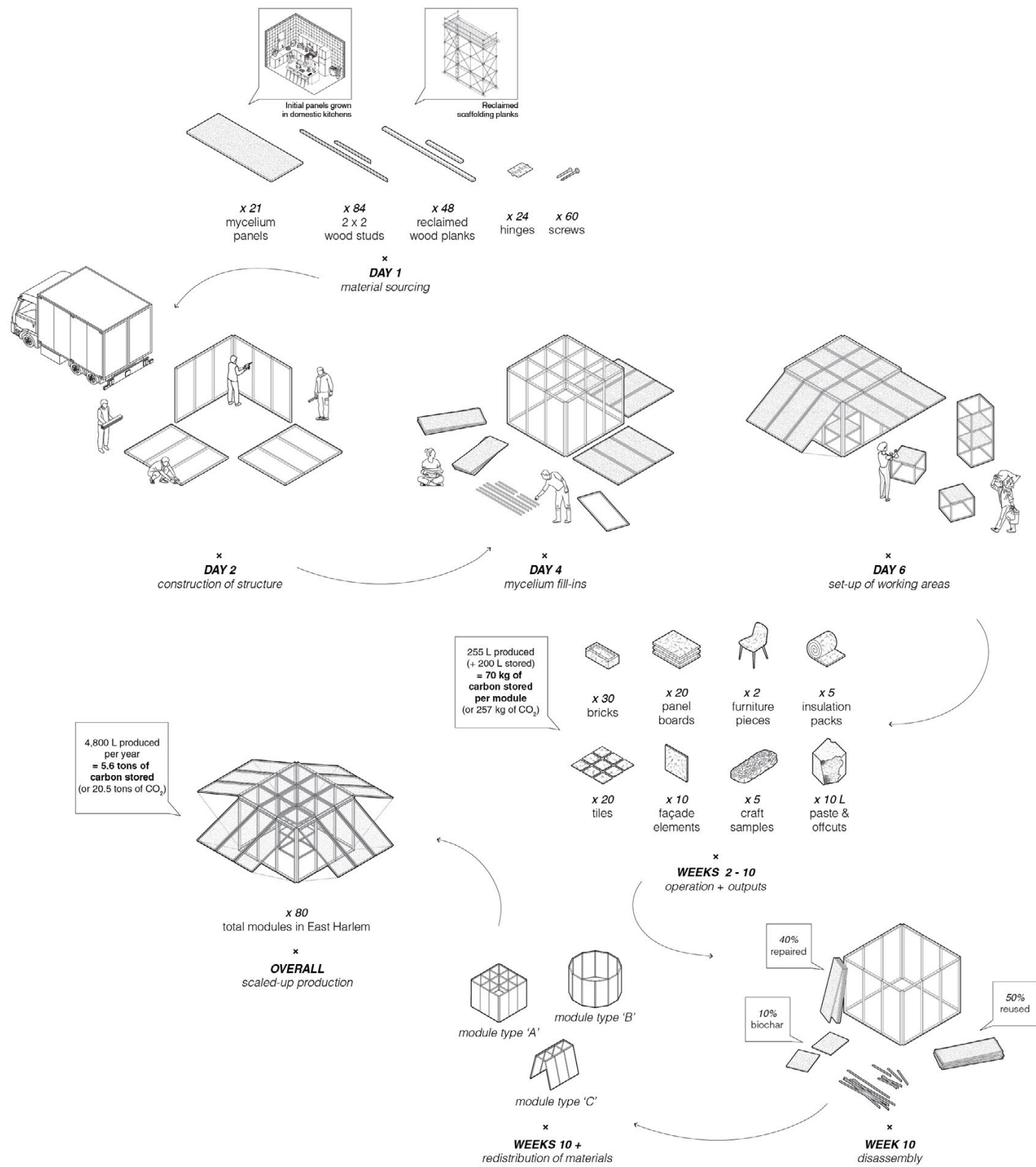
day 7



material experiments

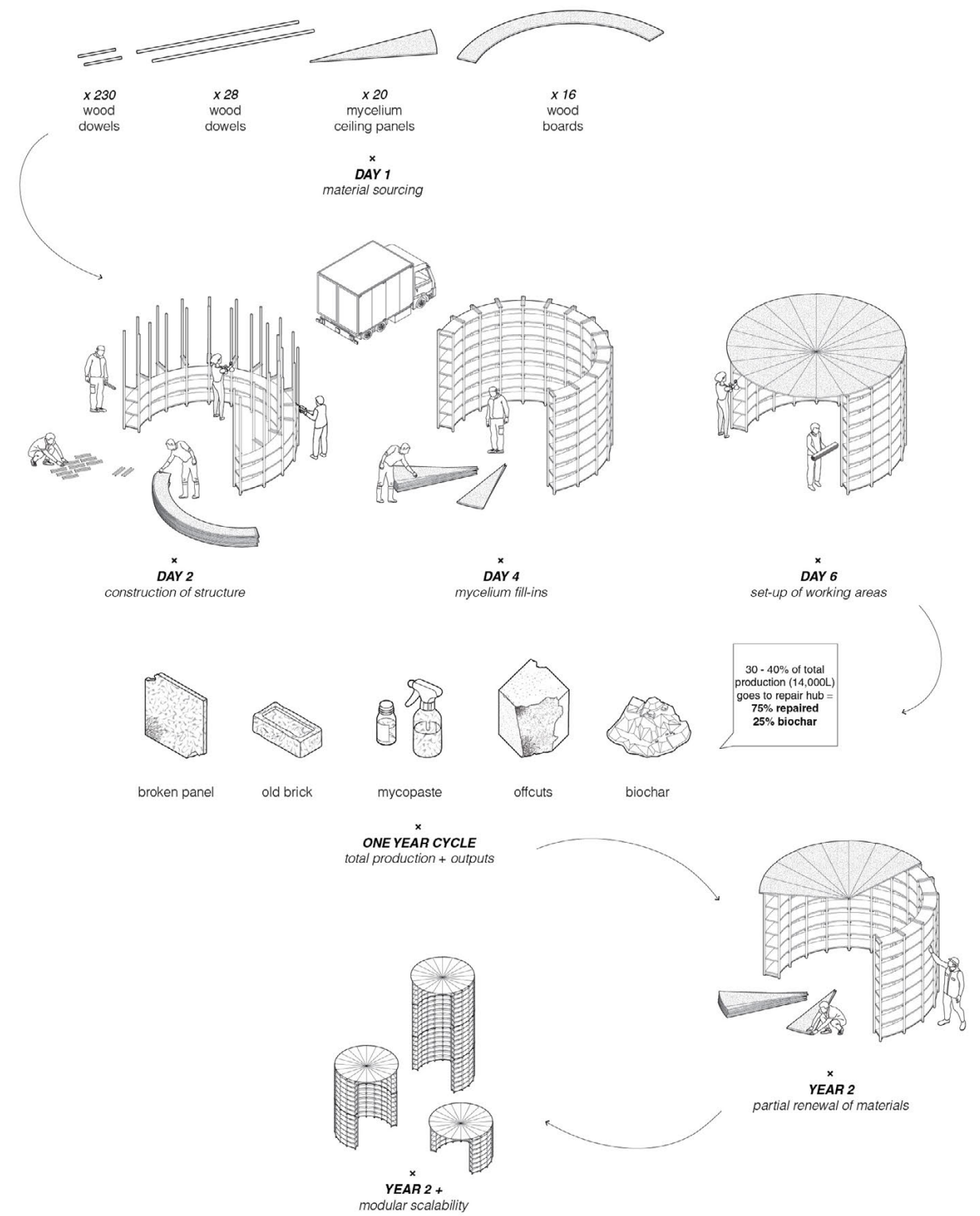
testing mycelium blocks, bricks, and fruiting bodies across substrates, moisture gradients, and growth cycles; the work documents what mycelium requires to thrive, not as extractable resource, but as co-inhabitant, learning through failure, care, and observation rather than specification





biokitchens: community scale

small ten by ten modules placed inside community gardens built by volunteers, operating in ten week cycles, with each module serving around ten households at a time



repair hub: neighborhood scale

modules that shelve, store, and display materials in different states, serving as a space to repair, replace, repurpose, or break down mycelium-based composites

Cooking Architectures:

Culinary Processes, Microbial Ecologies, and Acts of Care

Fall 2025. History / Theory.

Extreme Design. Professor: Mark Wigley.

Finding food and building shelter were some of the first primal intuitions humans had. Architecture is to shelter as gastronomy is to food.¹ Yet at some point, they became distinct activities. Cooking remained tactile, sensory, collaborative, and dependent on care. **But building shelter entailed separation; architectural practices increasingly framed shelter as a means of separating humans from the soil. This separation created distance from microbial biodiversity, leading to decreased microbial resistance.**² Indoor microbiomes today host the same set of microbes repeatedly, causing buildings to become biologically "malnourished." Cooking, in theory, did not separate itself from the soil; good ingredients are still understood as those from healthy, well-tended environments. While architecture drifted away from human experience, cooking never did. **From cooking, architects can learn to listen to materials, adapt, embrace variation, respect timings, and above all, to care more. It is not about a final perfect product but about ongoing care and maintenance. Situating architecture in terms of culinary processes offers a paradigm to better understand the built environment.**

Since buildings function as microbial ecologies, most buildings today are biologically impoverished, making rewilding of the indoors necessary. If one thinks of materials as ingredients, one can ask: **How do material choices inform microbial diets?** Wood is porous and allows for diverse communities; lime plaster supports alkaline-tolerant bacteria; synthetic plastics starve ecosystems. To choose a material is to choose a microbial ecology. Materials today prioritize efficiency over user experience. **But we consume buildings — we breathe them, smell them; our bodies absorb their dust, humidity, and microbes. If architecture enters our bodies as food does, we should choose building ingredients with equal care.** Through three case studies, this paper argues that rethinking architecture through culinary processes reframes building as a practice of participation, nourishment, and care, shifting architecture away from finished objects toward living microbial ecologies that must be actively sustained.

Participation examines how architecture is made and who is involved. Hundertwasser argues one should be able to build and be responsible for their own house, and only when architect, bricklayer, and tenant are interrelated can this be considered architecture.³ **The resident is not a passive end user but an active participant in construction and maintenance.** Rauch House, formed by clay builder Martin Rauch as his residential and studio building in collaboration with architect Roger Boltshauser, embodies embracing materials as ingredients and architecture as culinary processes requiring active participation. Located in Austria, it is a rammed earth construction built using soil directly from its site. Handmade by packing layers of damp soil into formwork to create solid walls, the construction process is essentially cooking with a full

ingredient list: soil, clay, sand, all containing bacteria, minerals, and organic traces.⁴ The walls breathe, change tone, regulate humidity, and host complete microbial ecosystems. Rauch House demonstrates how construction can become a recipe, allowing architecture to detach from its obsession with permanence and efficiency and embrace impermanence and individual involvement.

Nourishment shifts attention toward how material choices determine what kinds of life a building can support. While most people have been involved in cooking, this is seldom the case in architecture, where divisions of labor in construction are clearly defined.⁵ Flat House by Practice Architecture and farmer Steve Barron, located in the U.K., embodies cooking as a microbial act and architecture as requiring active nourishment. The house is grown almost entirely from hempcrete, made by mixing Barron's hemp fiber crops with lime.⁶ While lime participates in extractive practices, it functions here as a binding agent enabling biological materials to perform. The house is biogenic, low-carbon, and alive in how it behaves. Its simple wall build-up allows the building to breathe by letting moisture pass through. The hemp was grown in fields next to the building site; frame and infill were cast by hand. Hempcrete is mixed by hand, judged by texture, poured with sensitivity, and cured slowly. It feeds microbial life instead of sterilizing it. Its porosity allows fungi, bacteria, and microbes to live inside it. Flat House frames architecture as a system that must be nourished rather than controlled. **Material selection becomes a question of what kinds of life a building can support, akin to how choosing ingredients determines nutritional quality of a meal.**

Care provides a framework for understanding the built environment. As Puig de la Bellacasa contends, care can be understood as the set of material practices that allow something to continue to exist over time. It is not a moral attitude but a form of ongoing involvement necessary when working with living systems.⁷ **Mycelium, when used as construction material, is a clear example of a system that only works if one participates in its development. It grows by eating; its architecture comes from metabolism, not manufacturing. It is the epitome of what it means for a material to host microbial life rather than suppress it.** Lovely Trash Column by Blast Studio is a structure grown entirely with mycelium and recycled coffee cups, cardboard, and paper. The mixture is 3D-printed into formwork and left to grow while it binds and strengthens as fungus spreads through substrates. During this stage, moisture, temperature, and airflow must be monitored because the material is actively alive and responding to its environment.⁸ The final column is both structural and biological — a full expression of architecture-as-cooking: preparing ingredients, setting conditions, collaborating with organisms, and surrendering part of the process to microbial agency. Since performance depends on maintenance of microbial conditions, this architectural process is no longer defined by completion but by continuous work required to support its processes.

Prevailing architectural practices imagine buildings as frozen, clean, static objects, producing sealed surfaces, sterile interiors, and fears of dirt, moisture, and time. But architecture is the product of human and nonhuman interaction. **Space is not a neutral container but the effect of inhabitation. A building should be something we live through, not something we merely live with.** Hospitality means hosting rather than sealing out, making it useful to think of buildings as holobionts. Like bodies, buildings are composed of structure, skin, and everything that circulates in between: inhabitants, microbes, materials, air, moisture. They

breathe, metabolize, and eat. Materials absorb oil, humidity, and microbes while inhabitants inhale and touch these surfaces. Buildings have microbiomes just as stomachs do, and architectural linings, like intestinal linings, regulate what enters and exits these systems. Choosing porous, breathable materials allows for greater microbial biodiversity and healthier indoor ecologies. The three case studies reframe architecture through participation, nourishment, and care, shifting architecture away from static form toward livable, participatory processes. **This transforms architectural roles: the architect becomes less a form-giver and more a care-taker, while the resident becomes an active participant engaging with maintenance as a familiar part of inhabitation. This shift reframes architectural values. Rather than prioritizing efficiency and control, architecture can address pleasure and experience.** Cooking offers a model for this transition: it balances necessity with sensorial engagement, nourishment with enjoyment. By adopting culinary processes as a design paradigm, architecture can move beyond permanence and purity toward methods that embrace time, variation, and maintenance. Growth, decay, curing, patina, and weathering become essential ingredients. Architecture is no longer a finished object but an ongoing practice requiring participation, nourishment, and care.

What I have begun to understand is that thinking through microbes does not simply mean adopting new materials but reconsidering systems and assumptions that shape how buildings are made, maintained, and inhabited. The introduction of synthetic materials allowed humans to stay in place and buildings to remain stable, sealed, and standardized regardless of contextual conditions. This shift enabled permanence and efficiency but reduced architecture's dependence on local ecologies. Material practices moved from cultivation to production, prioritizing control over care. The return to biogenic materials challenges architectural values. Living

materials reintroduce time, growth, and decay into design. **What is necessary is a shift in mindset: an understanding that architecture should involve constant care rather than complete control. This perspective shifts perceptions from materials as interchangeable products to materials as situated ingredients, acknowledging dependency, embodiment, and attention as indispensable conditions.** These reflections generate more questions than conclusions. One framework I have questioned throughout the course is health, safety, and welfare: whose bodies, environments, and ways of living do these standards serve? **If buildings are microbial ecologies rather than sealed containers, which kinds of health are being protected, and which excluded in the name of safety? Could one redefine welfare if participation, nourishment, and care are acknowledged as fundamental? What would it mean to apply this thinking to an existing New York City apartment? What would reintroduction of soil in Manhattan entail? How can architecture negotiate between control and care? Between efficiency and nourishment?** These questions remain unsolved, but they point to an architecture that should confront, not necessarily resolve, its relationship to life, control, and responsibility. Care is not a solution but a condition architecture can no longer avoid.

Notes

1. Lessons of Gastronomy, Xiao Wu
2. The Built Environment is a Microbial Wasteland, Sean M. Gibbons
3. Mouldiness Manifesto Against Rationalism in Architecture, Hundertwasser
4. The Rauch House: A Model of Advanced Clay Architecture, Roger Boltshauser and Martin Rauch
5. Building and Living, Eating and Drinking, Considered in Terms of Architectural Theory, Fritz Neumeyer
6. Flat House, Practice Architecture
7. Matters of Care, María Puig de la Bellacasa
8. Lovely Trash Column, Blast Studio



Mycopot

Scaffold for Mycelial Inhabitation

Spring 2026. Design Seminar. Architectures of and for the More-Than-Human. Professor: Mireia Luzárraga.

This prototype explores architecture as care infrastructure for non-human life. Rather than extracting mycelium as a material resource, the structure serves its growth - providing substrate, moisture, and environmental conditions without human use-value. The design consists of two perforated wood panels suspended by threaded rods above a 3D-printed moisture base. Hemp fibers thread through the panels, creating a vertical network for mycelial colonization. The base holds wet organic substrates (coffee grounds, wood shavings, damp cardboard) that release humidity upward while feeding the mycelium below. Mycelium thrives on cellulose-based materials and requires specific conditions: humidity, ambient airflow, darkness or low light, and stable temperature. The architecture mediates these needs through its material assembly. Hemp fibers wick moisture from the base through capillary action. Perforations in the wood panels regulate air exchange without desiccation. The layered structure creates a gradient: high humidity near the base, moderate conditions above. Growth becomes visible as white mycelial threads colonize the fibers over one to three weeks, transforming the scaffold into a living network. The prototype inverts the typical relationship between architecture and biology — here, the mycelium is the inhabitant, not the building material. The structure offers care without extraction, supporting interspecies coexistence through attentive design.



final review: interspecies picnic



day 3



day 5



material studies

the prototype inverts the typical relationship between architecture and biology: mycelium is the inhabitant, not the building material





Traced Grounds

Amor Mundi; Ishigaki, Japan

Spring 2026. Advanced Studio VI.
Studio Critics: Jing Liu & Alessandra Cianchetta.

Traced Grounds begins with entanglement: the physical and conceptual relationship between architecture and environment. In a subtropical forest, entanglement is visible: roots tangling underground, light filtering through canopy, undergrowth filling spaces between, paths worn into ground through accumulated movement. These are not separate systems but woven together. Architecture here cannot be autonomous. It must acknowledge that it is part of this entanglement. That thinking led to a line: a path traced intuitively across the site to engage with entanglement rather than impose order. The line responds to what is already there: slope, trees, existing clearings, streams. It follows the terrain, and from that line, everything else generates. The path creates a non-conventional grid, a set of rules. Buildings appear where the path needs them: a kitchen, workshop, library, dwellings. They are scattered but organized by this wandering line. The path creates the architecture. Then the architecture becomes path. You move through open structures, under canopies, between walls. Inside and outside dissolve. The architecture does as little as possible. Buildings are framings of space — planes, lines, surfaces. Thin concrete canopies hover. Low walls frame views but don't fully enclose. Floors step down the slope in terraced platforms. Some buildings rest directly on the jungle floor. Others have concrete slabs and can close completely. Concrete provides structure and contrast to the forest. Wood brings different temperature. Fabric curtains allow flexibility. The experience alternates between drift and gathering. Solitude happens in forest passages between buildings. Community forms where paths converge. The forest remains primary.

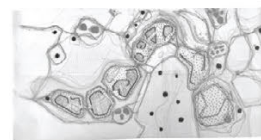
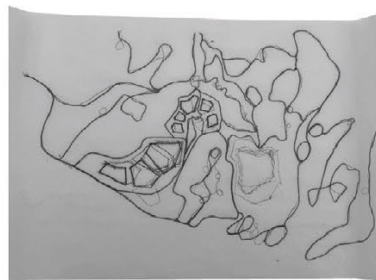
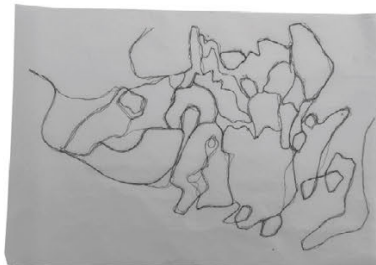
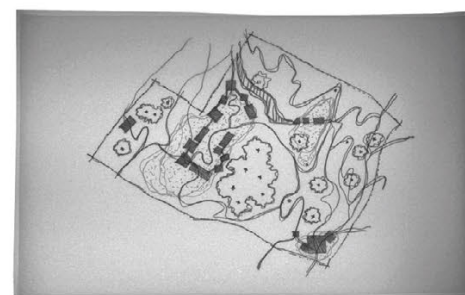
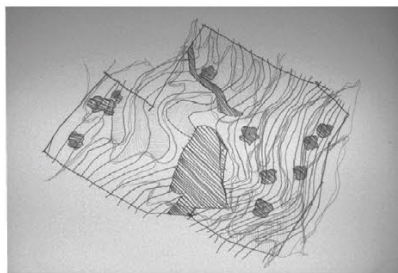
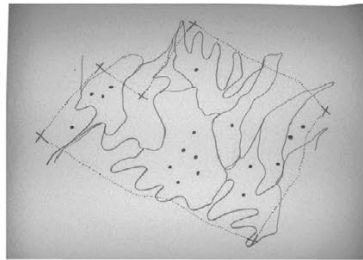
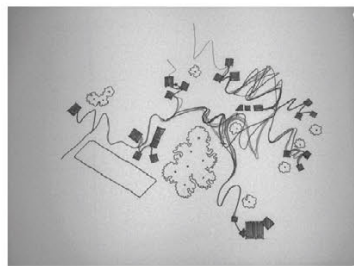
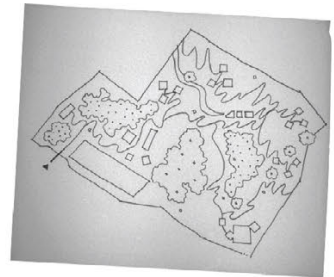
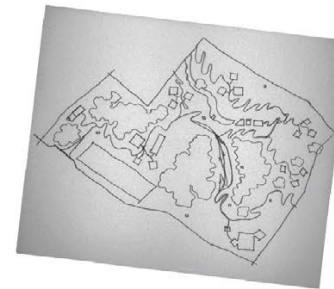
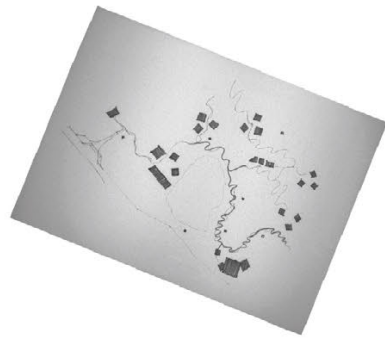
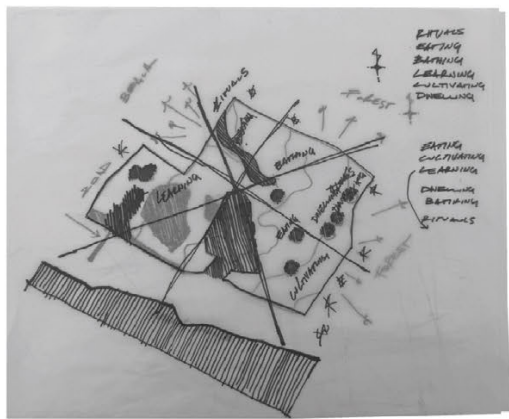
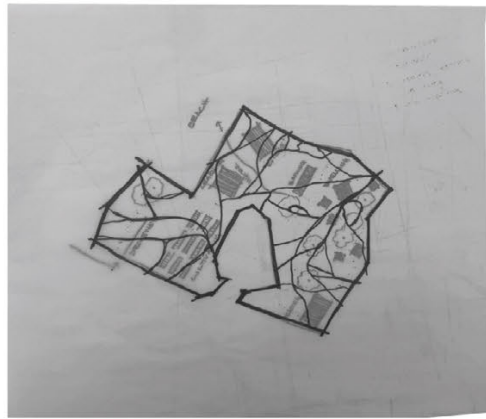




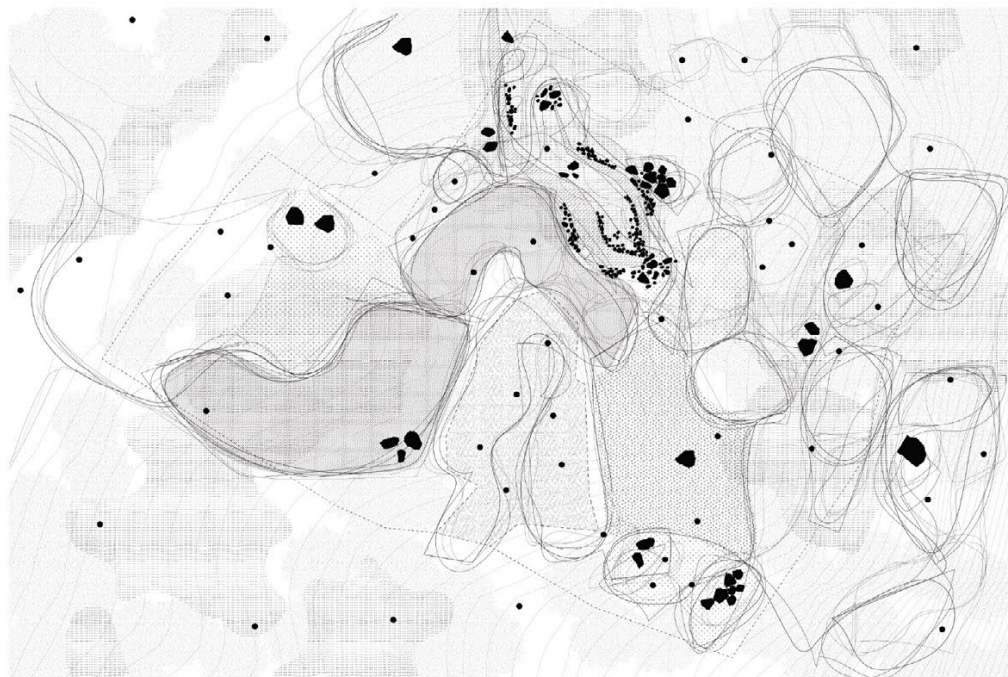
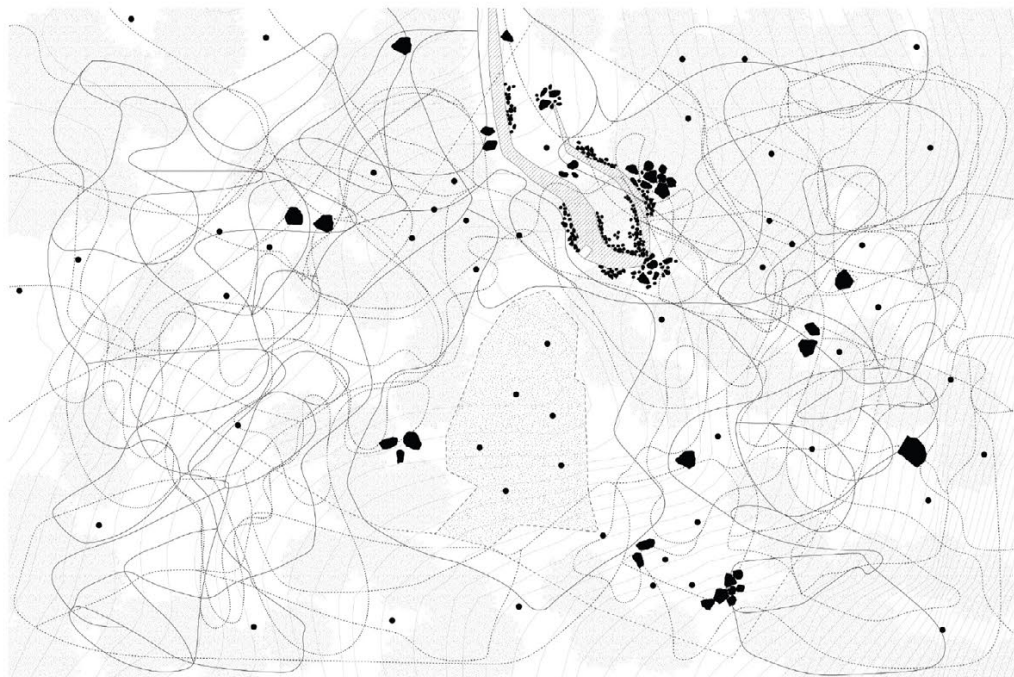
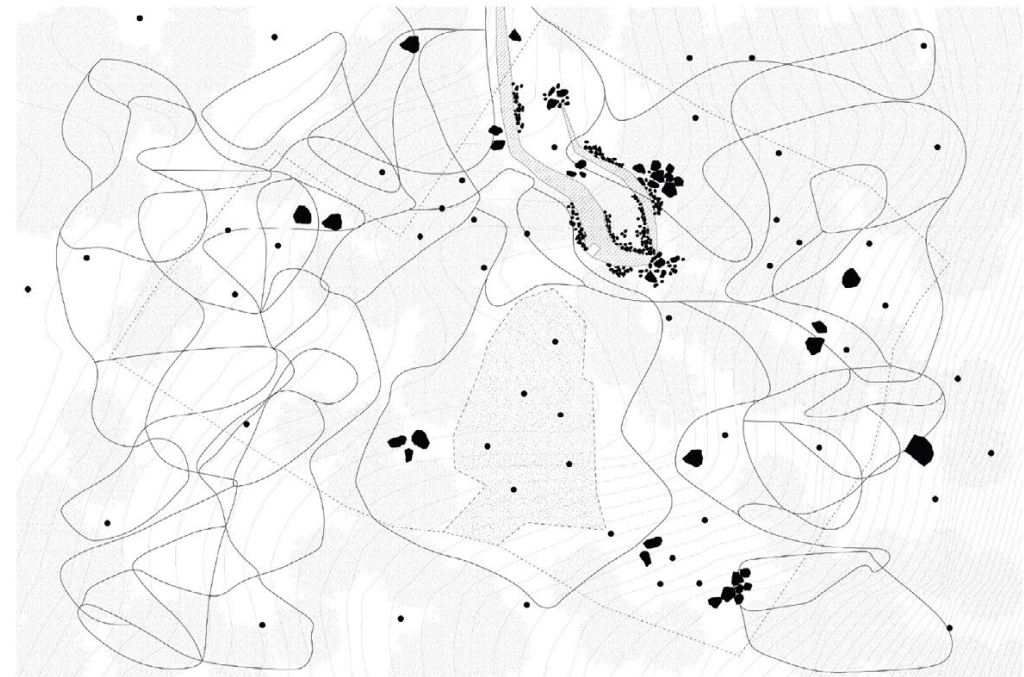
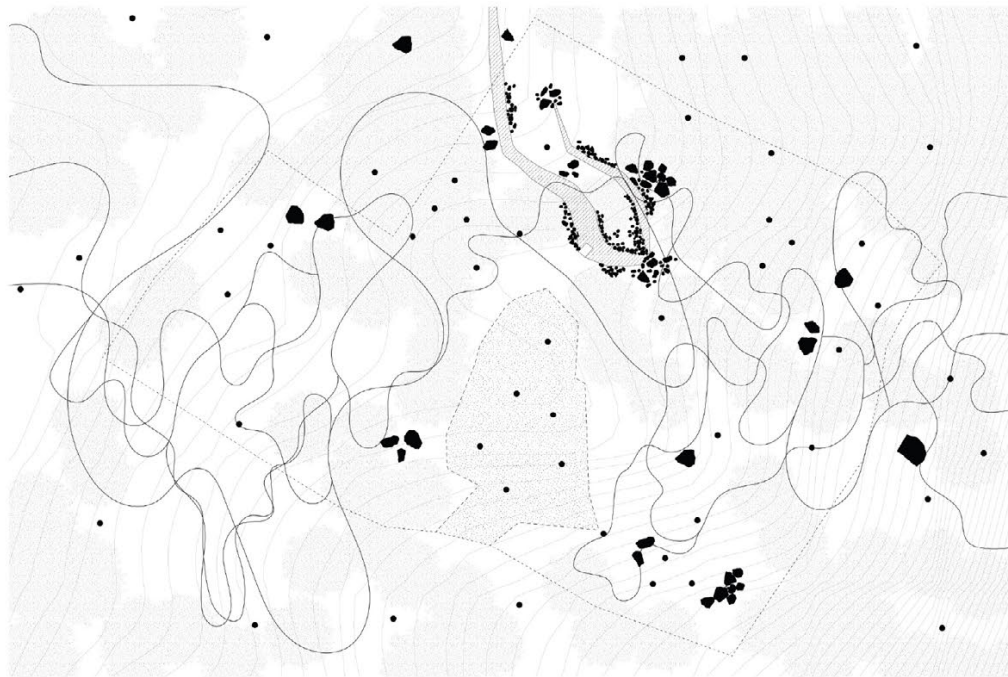
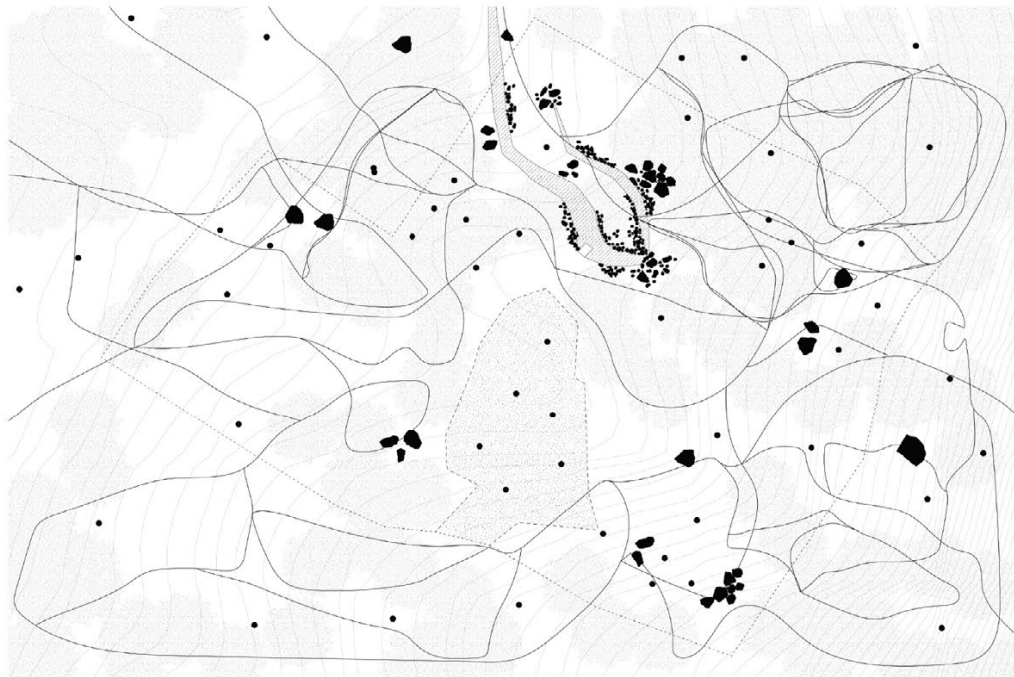




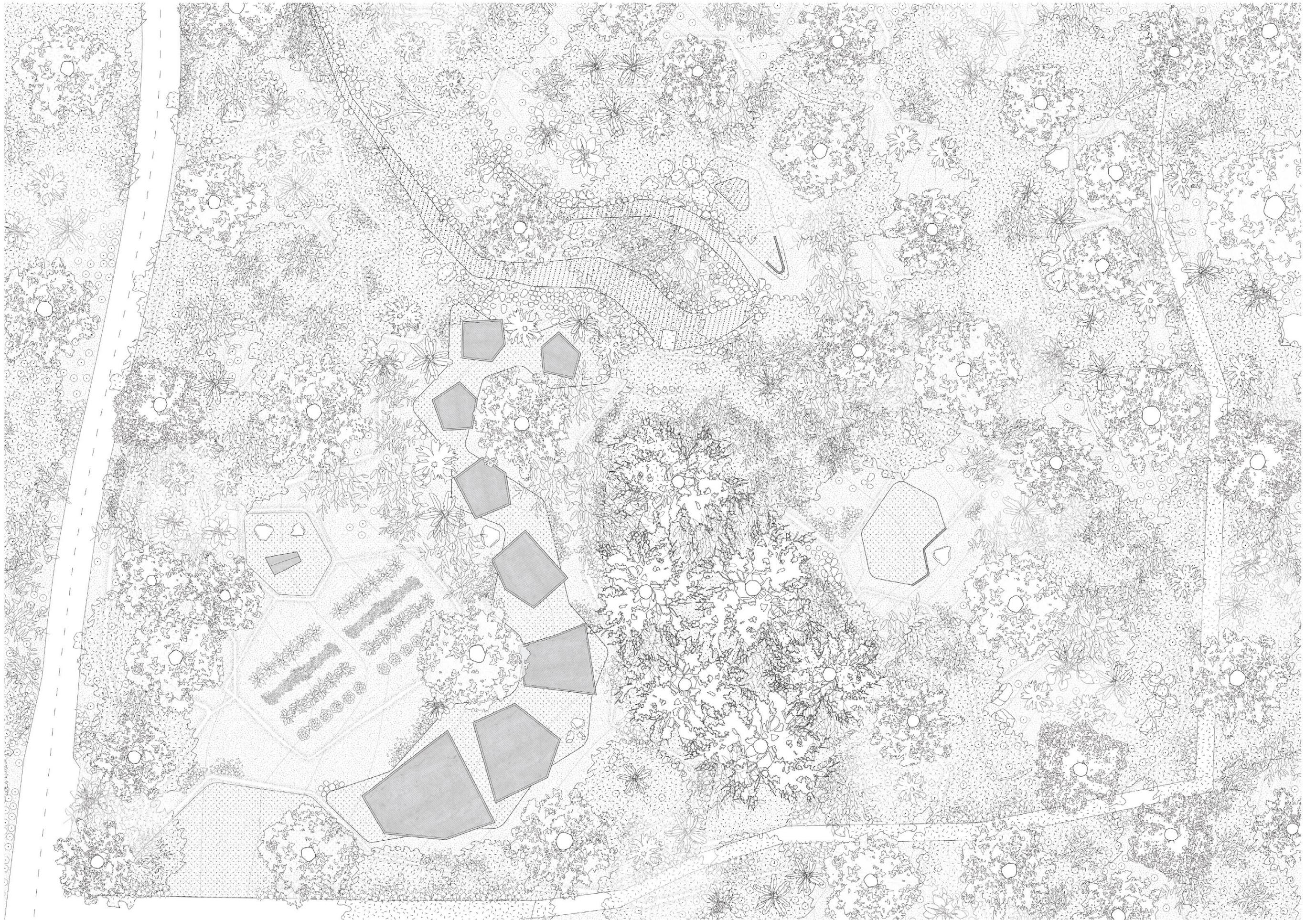
concept collage
roots tangle underground while light filters through canopy;
entanglement as both physical condition and conceptual
framework

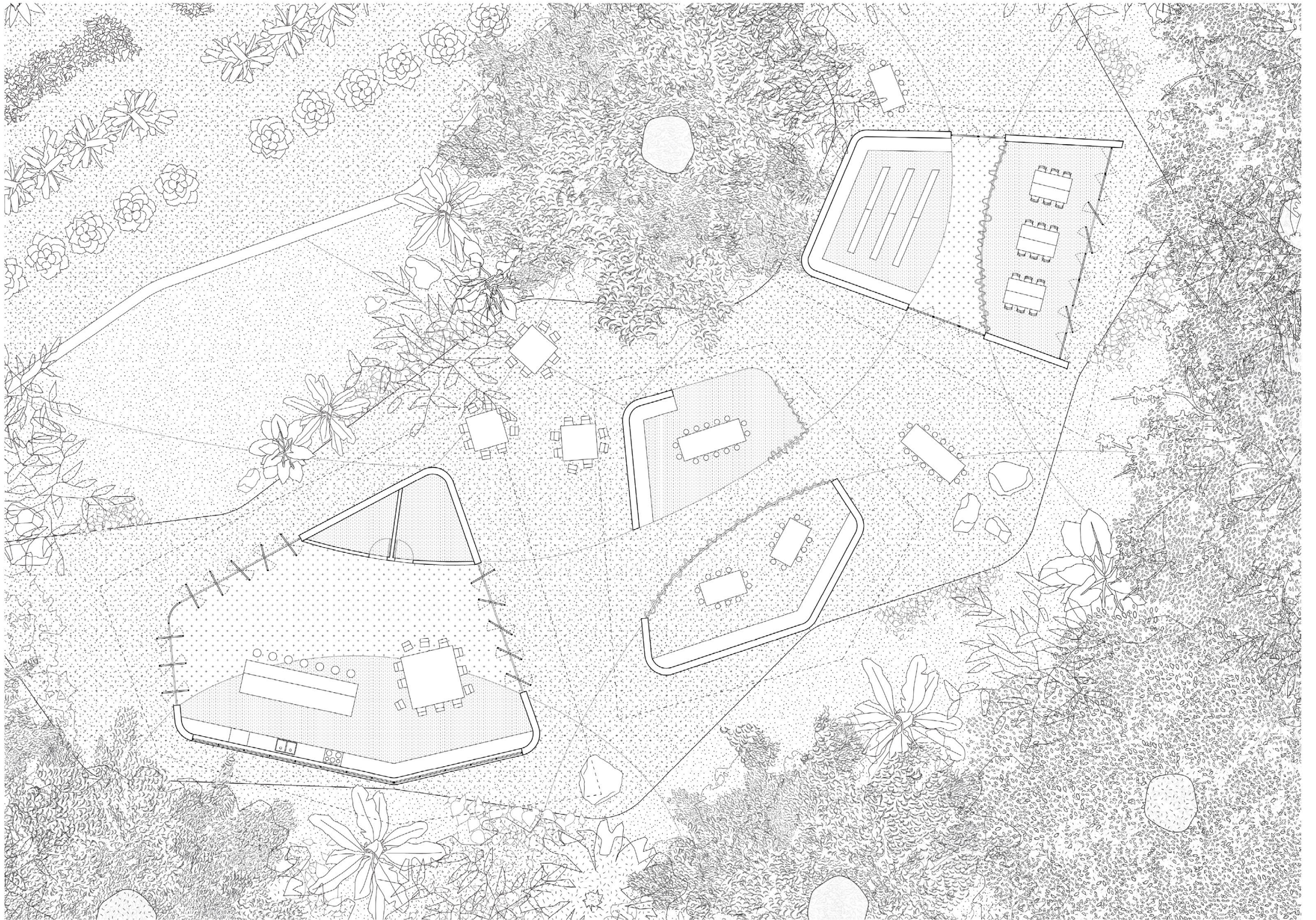


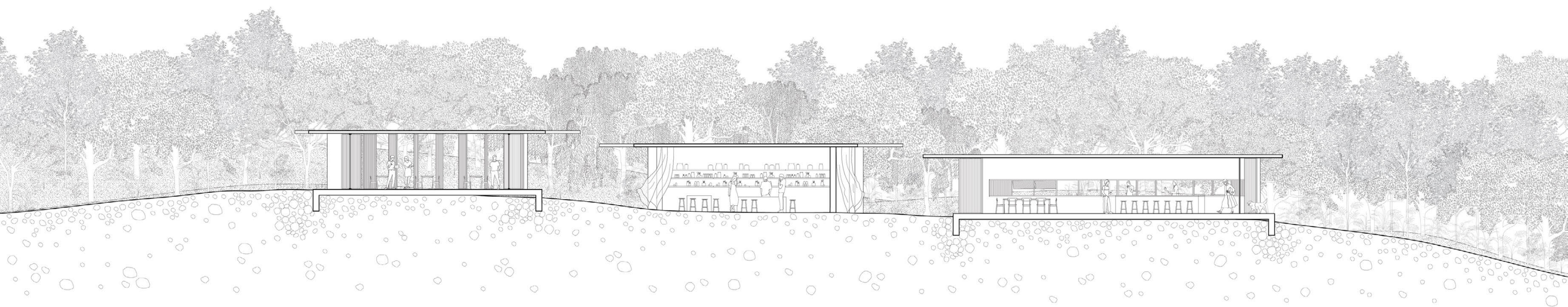
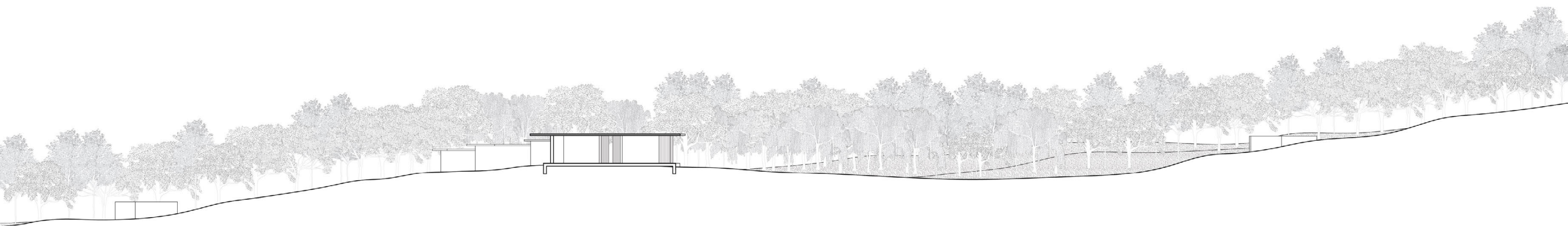
sketching sequence
the path emerged through intuitive drawing; each iteration traced possibilities, testing how a wandering line might organize scattered programs across sloped terrain

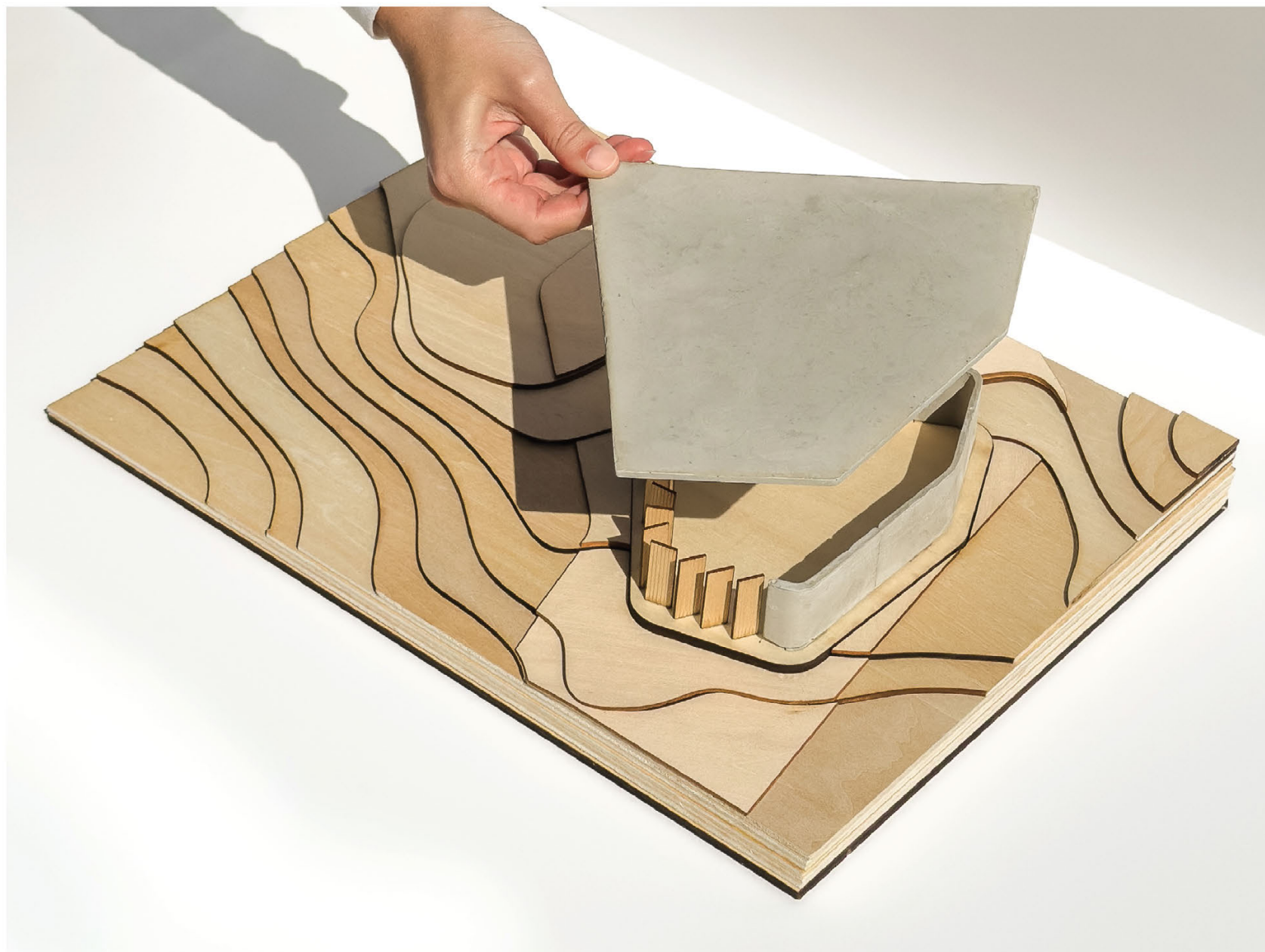


linework translation
analyzing Marden, Pollock, and Cage's lineworks revealed how line generates structure through response; these studies informed a finalized path sequence: intuitive but deliberate, wandering but organized









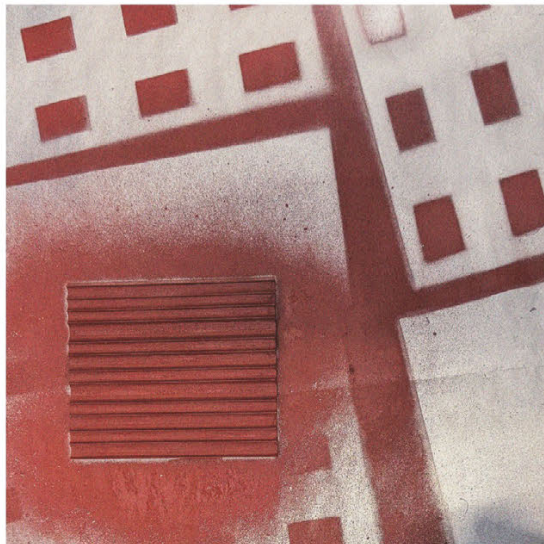
1:100 and 1:1000 models
cast-in-place concrete and wooden louvers establish the material language shared across all buildings; site model reveals scattered buildings organized by the wandering path, following terrain and creating gathering moments





visual studies
 architecture frames rather than encloses: buildings become thresholds between forest passages; embedded into sloped terrain, they stage moments of pause and gathering while remaining secondary to the surrounding landscape





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