



Chris Martin
Smith, RA

Columbia GSAPP 2025

A4853_0010 Advanced Architectural Design Studio. **SUMMER 2025**

Partner: Bin Tang

Professors: Amaia Sánchez-Velasco and Jorge Valiente-Oriol (from GRANDEZA STUDIO)

Teaching Associate: Amy Suzuki

Hudson's River Political Personhood: Staging Alternative Fluvial Futures

THE HUDSON RIVER AS A STAGE OF THE PLANTATIONOCENE

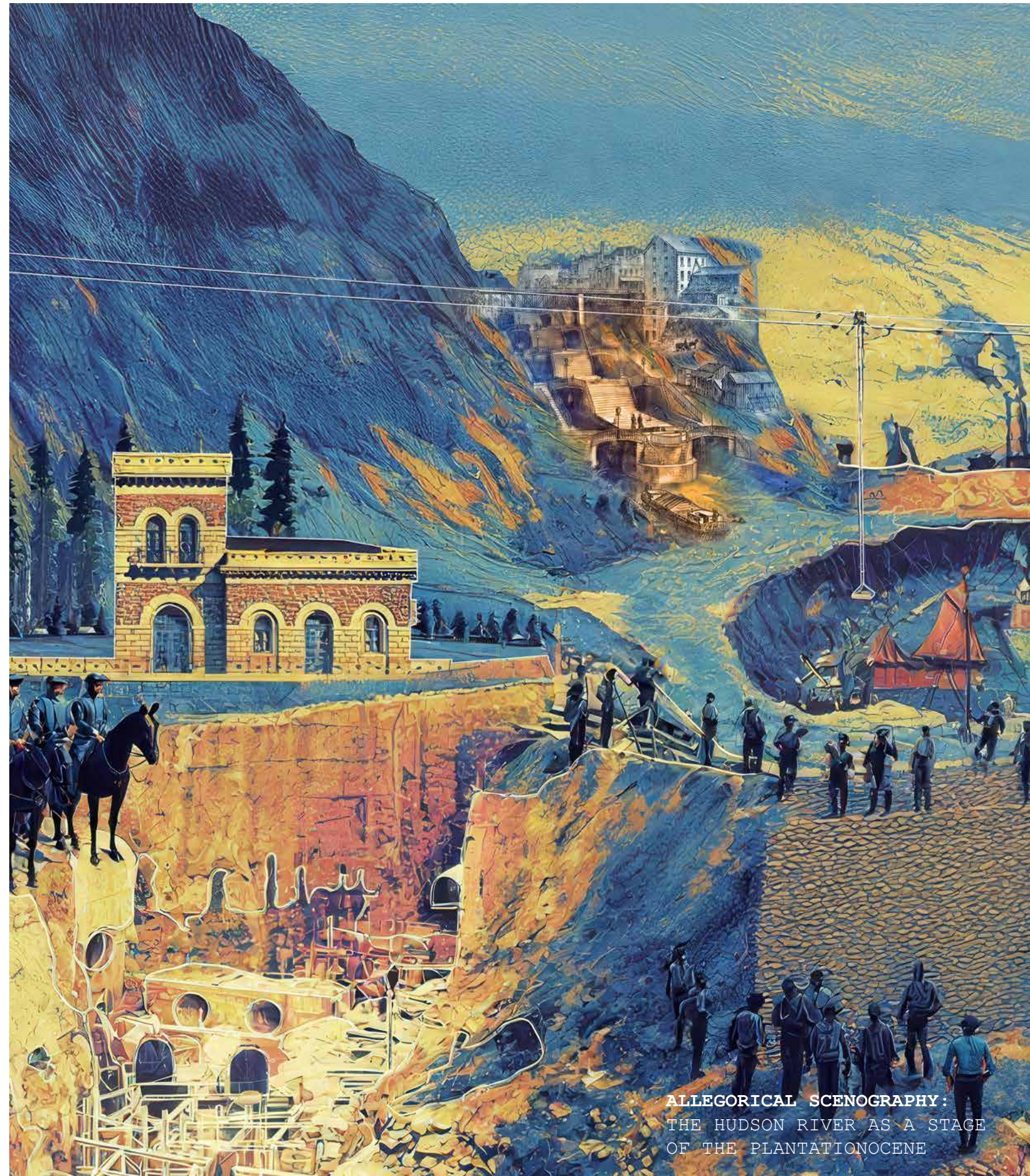
Definition of Terms: In October 2014, in a conversation at the University of Aarhus, participants coined the term “Plantationocene” to describe the transformation of human-managed farms, pastures, and forests into extractive, enclosed plantations relying on slave labor and other exploited, alienated, and often spatially displaced labor. —Dona Haraway, *Environmental Humanities*, vol. 6, 2015, p. 152

Project Description: Our project is described in two primary arguments. First, through extensive research our project forms an understanding of the Hudson River via a deeply evaluated history where the boundaries that define the river's extent expand further than its banks. Through a series of five localized acts, the Hudson River is revealed to be enmeshed in a series of myths that have allowed for its watershed, timbershed, and history to be objectified, extracted and erased. In a phrase: the Hudson River became a stage upon which the Plantationocene was realized. Colonial mythology allowed and promoted ideas of the endless supply of these natural resources. It was the myth that allowed for the Hudson to be polluted and kept dirty because of a massive infrastructure of pipes, aqueducts, reservoirs allowing for an ever expanding population of New York City. These aquatic ghosts of the Hudson River are built into our project and revealed in a series of allegorical scenographies that allow for a deeper and more complex reading of how strangely looped and enmeshed the ecology of the Hudson River is presently displayed in NYC.

Second, our project reconstitutes the innate rights of the Hudson River directly, and looks to subvert these very myths placed on it by a constructing rehearsals of alternative fluvial futures. These alternatives are linked to the five acts of research and are presented as follows in a five act play:

INTRODUCTION TO ACT I: THE STREAMS BENEATH US Before aqueducts and reservoirs, Manhattan (Manahatta) drank from a freshwater body just north of City Hall: Collect Pond. It was sacred to the Lenape and critical to the growing city—until waste and tanneries poisoned it. In its place: a jail, a courthouse, and an engineered grid. But water resists burial. As the city expanded, so did its need for imported water—first through the Croton Distributing Reservoir at 42nd Street, and eventually into Central Park's Jacqueline Kennedy Onassis Reservoir, which was decommissioned in 1993. In this act, we return to the marshes and streams under Center and Leonard Streets—not to mourn malfunction, but to daylight what the city has buried. This act reconstitutes the river by granting it the right to be restored—physically, ecologically, and spiritually—into the life of the city.

INTRODUCTION TO ACT II: THE POOL BENEATH THE DAM Completed in 1906, the New Croton Dam was an act of monumental engineering—and monumental displacement. Farmlands flooded. Villages erased. All in service of supplying New York City with clean, gravity-fed water. The dam still holds, but its purpose—pure extraction—now fractures. This act asks: what happens when a dam, instead of withholding, releases joy? This act grants the river the right to flow—selectively, joyfully, ceremonially—free from the static logic of total control.



ALLEGORICAL SCENOGRAPHY:
THE HUDSON RIVER AS A STAGE
OF THE PLANTATIONOCENE

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INTRODUCTION TO ACT III: THE CITY AS FOUNTAIN The Catskills Aqueduct, completed in 1915, carries clean mountain water to New York City. For over a century, this hidden network has run beneath streets and sidewalks—often unrecognized, always vital. But what if it did more than serve silently? What if it celebrated? In this act, the River Tribunal envisions a re-purposing: the fire hydrant, historically a tool for emergencies, becomes a ritual of joy. Every ten feet, a hydrant becomes a fountain. A field of fountains. The park becomes a collective shower. This act grants the river the right to flow—not just in pipes or tunnels, but in public, as joy, as relief, as civic delight.

INTRODUCTION TO ACT IV: THE FOREST REMEMBERS Before timber was an industry, it was an ecology. Before sawmills, there were beavers. The Hudson Valley's first major extractive economy was fur—and beavers were its keystone. The "Beaver Wars" of the 17th century saw European colonies and Indigenous nations fighting over pelts and waterways, transforming the region's hydrology. By the 1800s, fur gave way to timber. Logging intensified near Poughkeepsie and beyond until the Catskills were nearly clear-cut. In response, both the Adirondack Forest Preserve (1885) and a push to restore beaver populations took hold. This act grants the river the right to maintain its biodiversity, honoring not only trees, but the full multi-species ecosystem—especially the beaver—that once stabilized its banks and might again. This is not nostalgia. It is a radical rewaving of ecological memory.

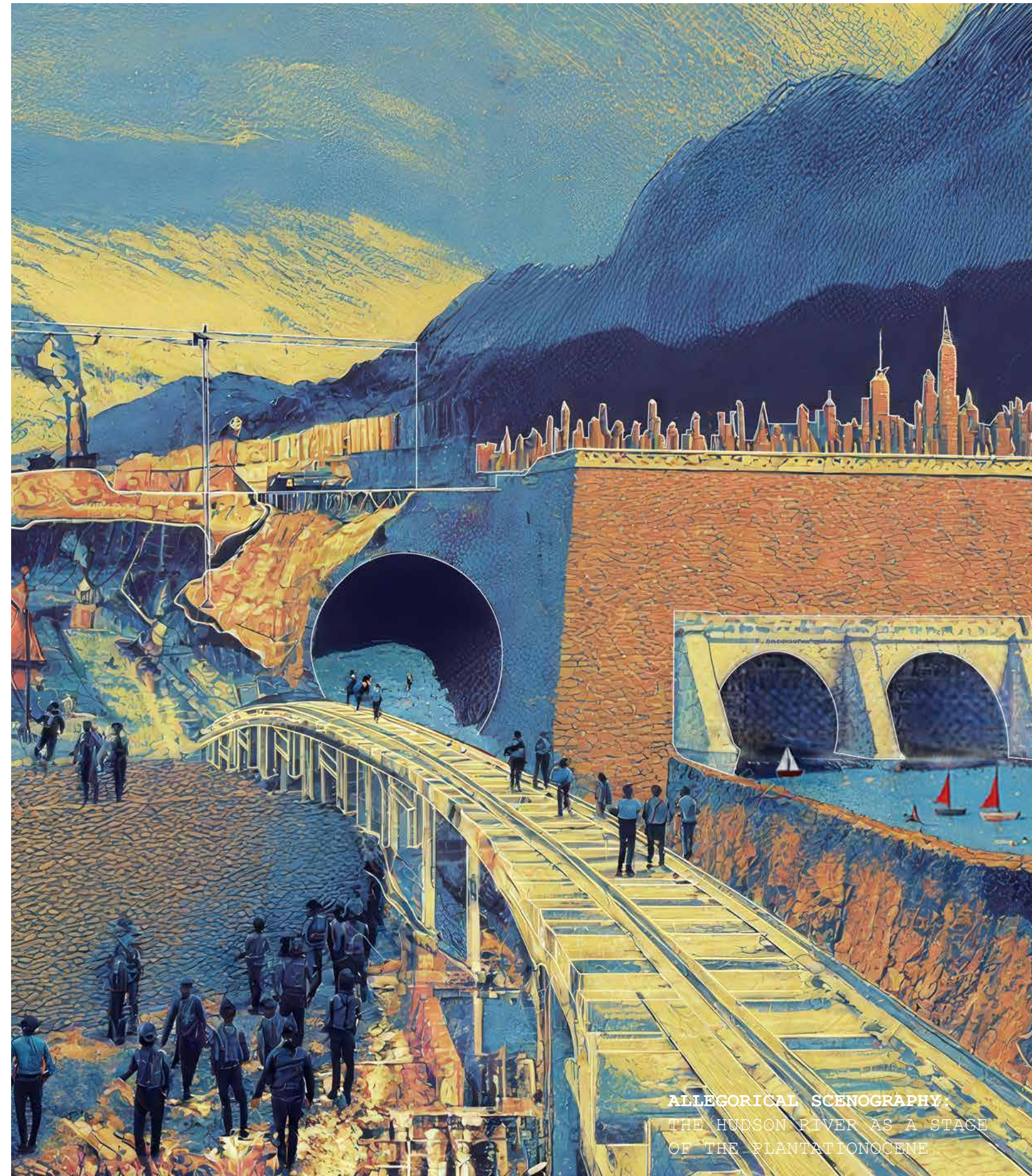
INTRODUCTION TO ACT V: THE CANAL ASCENDS The Erie Canal, completed in 1825, was both marvel and machine. Linking the Hudson to the Great Lakes, it advanced a new kind of inland empire—made possible by Irish labor, engineering, and locks. In Lockport, water ascended in five steps. What once lifted barrels of wheat now lifts nothing. This act grants the river the right to perform its functions within its ecosystem—not as an extractive utility, but as a site of ecological ceremony. What rises here is not cargo, but collective transformation.

CAST OF CHARACTERS

RT — The River Tribunal, "The River's Human Face." Shape-shifter: animal, human, machine, ecology. Presides with calm, sly humor.

C — A professor. Dry. Detached. Obsessed with history, surface myths, architectural authority.

B — Young. Direct. Sassy. Quick. Knows when history is lying.



ALLEGORICAL SCENOGRAPHY:
THE HUDSON RIVER AS A STAGE
OF THE PLANTATIONOCENE



ACT I. INVISIBILIZATION/REVEALING: THE RIGHT TO BE SEEN

Location: Center & Leonard Street, Manhattan

B: You really don't get it. We're standing on history-on water. It's not broken. It's resurfacing.
C: The Viele Map, 1865. These ponds were overwritten by rationality. Infrastructure replaced landscape. That's progress.
B: Yeah? Your progress is leaking.
RT: Ponds remember. So does marshland. Beneath the grid, the hydrology waits. You called it malfunction. I call it restoration-one that honors the river's right to be restored.
B: Imagine-daylighting it. Letting the ponds come back. Not floods, not punishment. Pools. Parks. Public space that breathes.
RT: The streams surface not to protest, but to return. A dark ecology rising-uncanny, persistent. Water claims its place in the city's body again.



W. A. Rogers, Pump on Greenwich Street, Below Canal, 1884, illustration, from the New York Public Library Digital Collections. Accessed July 27, 2025.



"Construction of Water Main Pipes in Manhattan," c. 1928, photograph, likely related to the New Croton Aqueduct system or city water infrastructure upgrades, New York City Municipal Archives. Accessed July 27, 2025.



Depiction of Laborers Installing Wooden Water Mains in New York City, 18th or early 19th century, watercolor illustration. Artist unknown. Courtesy of the New York Historical Society (or insert correct archive/source). Accessed July 27, 2025.



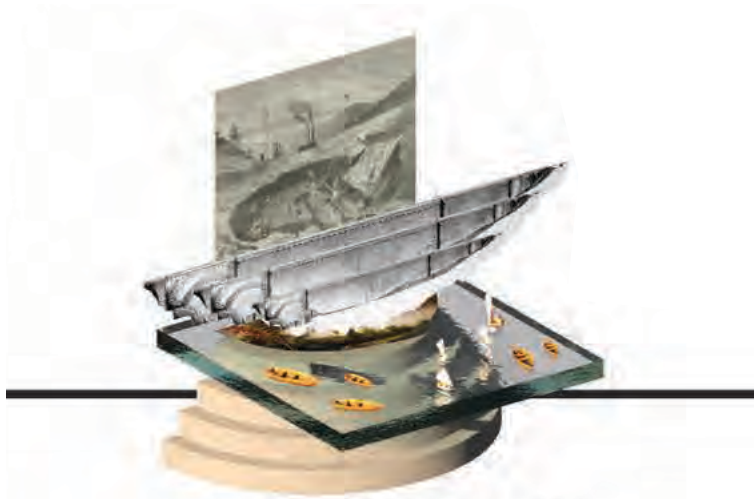
New York City Department of Environmental Protection (DEP), New York City's Water Supply System, map, accessed July 27, 2025, <https://www.nyc.gov/dep>.



New York City Department of Environmental Protection (DEP), New York City Water Supply: Catskill / Delaware Watersheds, map, accessed July 27, 2025, <https://www.nyc.gov/dep>.



J.H. Colton, Map of the State of New York Showing the Location of Boundaries of Counties and Towns, the Cities, Towns and Villages, Rail Roads, Canals, etc., compiled by S. Augustus Mitchell (New York: J.H. Colton, 1852), map, The New York Public Library Digital Collections.



ACT II. RETAIN/RELEASE: THE RIGHT TO FLOW

Location: New Croton Dam

B: Open the gates. Make a pool beneath the spillway.
RT: Selective release. Not flood-invitation. A lagoon for rest beneath stone once meant to dominate. The river claims its right to flow, and so it does-with care. (RT gestures toward the pool model-water gathered in a gentle invitation.)
C: Dams discipline rivers. That's their legacy.
B: Legacies change. Water can learn new scripts. So can we.
RT: Floating now, not anchored. Tributaries and water both. Spillways open with intention. Pools form where once there was discipline. The river flows again-not by error, but by right.
C: None of this is in the engineering specs.
B: Neither was joy. Neither was reciprocity. But here we are.
RT: This isn't malfunction. It's choreography. The right to flow enacted in strange joy-unwritten, but remembered.



Excavation for the New Croton Aqueduct, Showing Steam Shovels and Narrow-Gauge Railway Tracks, engraving, c. 1887, Courtesy of the New York Public Library Digital Collections.



Historic American Engineering Record. Old Croton Aqueduct, Ventilator Shaft No. 9, Van Cortlandt Park, Bronx, New York, HAER No. NY-111-1. Photograph by Jack Boucher, 1978. Library of Congress Prints and Photographs Division. Accessed July 27, 2025.



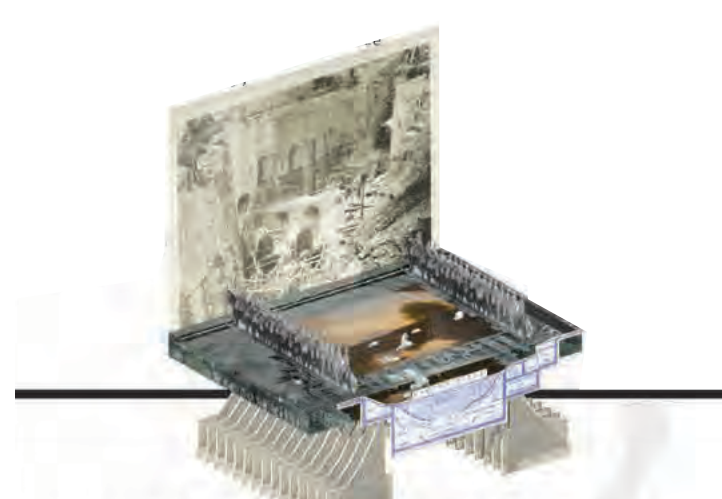
The Aqueduct Commission. Central Park Gate House (Section No. 17), map, January 3, 1888. Chief Engineer B.S. Church. Courtesy of the New York City Department of Environmental Protection.



Historic American Engineering Record. Old Croton Aqueduct, Ventilator Shaft No. 9, Van Cortlandt Park, Bronx, New York, HAER No. NY-111, Sheet 1 of 2. Drawn by T. Sorrell, 1978. Library of Congress Prints and Photographs Division. Accessed July 27, 2025.



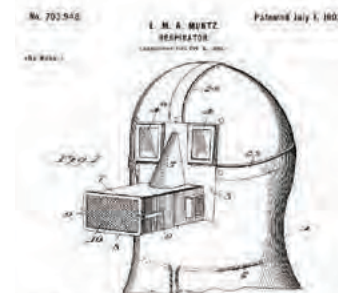
Jack Boucher, New Croton Dam, Croton River, Westchester County, New York (HAER NY-132-18), photograph, Historic American Engineering Record, National Park Service, U.S. Department of the Interior. Accessed July 27, 2025.



ACT III. DIVERTING/DISTRIBUTING: THE RIGHT TO PERFORM WITHIN ITS ECOSYSTEM

Location: A reimagined Harlem summer park, stone plinths separated by water pathways, gridded with hydrants every 10'.

B: Forget scarcity. We have flow. The aqueduct runs full-and this time, it's not locked behind stone. It's opened to us. Every ten feet.
C: Hydrants were for emergencies. Controlled bursts. Wrenches and warnings. You're proposing... what, exactly?
B: A choreography. Of joy. Of cooling. Of collective pleasure. Hydrants, fountains. Each one arcs into the air, falls into stone basins, and gathers.
RT: The aqueduct no longer ends in a valve. It ends in delight. A grid of relief. Water misting onto skin, bouncing off concrete, spiraling into celebration.
C: But it's potable water. Reservoir-fed. Protected.
B: Exactly. That's the point. We trust the aqueduct enough to drink from it. Now we trust it enough to dance in it.
RT: Collection basins gather the excess. Slowly, the water cools. It settles. It clarifies. And then?
B: It becomes a pool. A real one. A civic one. A public bath for the hottest months. The city becomes a fountain.
C: You've replaced crisis with choreography.
RT: We've replaced emergency with emergence. The river's right to flow is made visible, audible, splashable.
B: Not just infrastructure. Not just cooling. It's joy. That's the measure. We don't just use the aqueduct-we celebrate it.



L. M. A. Murtz, Respirator, U.S. Patent No. 793,948 (Issued July 1, 1902). U.S. Patent and Trademark Office.



"Construction of the Croton Aqueduct," New York Public Library Digital Collections, accessed July 27, 2025.



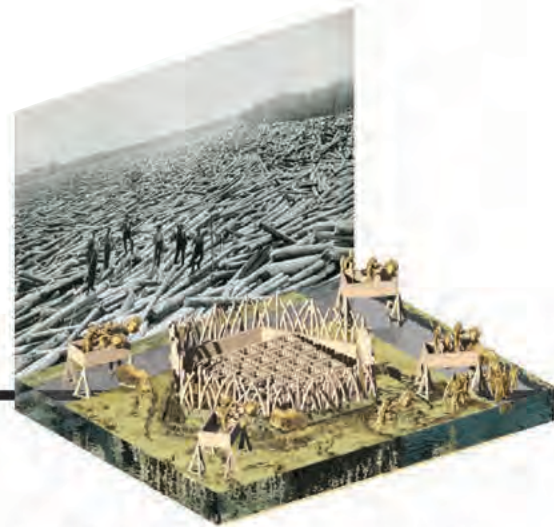
"Ashokan Reservoir, Olive Bridge Dam," in History, Scope and Engineering of the New York City Water Works (New York: Department of Water Supply, Gas and Electricity, 1915), 21.



"Drill Gang at Work in Tunnel," The Myrian and Ira D. Wallach Division of Art, Prints and Photographs: Photography Collection, The New York Public Library Digital Collections, accessed July 27, 2025.



"Aqueduct Police," Library of Congress Prints and Photographs Division, accessed July 27, 2025.



ACT IV.ERASURE/REPLENISH: THE RIGHT TO MAINTAIN ITS BIODIVERSITY

Location: Hudson Riverbank near Poughkeepsie, NY (Model: A meandering shoreline with reintroduced beaver dams)

B: The beavers were gone. Hunted, trapped, stripped from every stream. Not just for hats—for control. For dominion. Their dams slowed the rivers. That didn't serve capital.

C: The Beaver Wars weren't just skirmishes. They were systemic. Algonquin and Iroquoian nations drawn into proxy battles for French and Dutch empires. Beavers turned the river political. Then came the sawmills. (gestures) By 1880, even the Catskills were nearly clear-cut.

RT: The timber floated downstream. The profits went upstate. The forest vanished. Water ran faster, dirtier. So they preserved the mountains—not for the trees, but for the drinking water. And yet—somewhere—we remembered.

B: That's the act. Not preservation. Reintroduction. Beaver dams—again. Along the Hudson.Near Poughkeepsie. Restoring the sponge. Slowing the silt. Cooling the water.

(RT gestures to the model: sinuous dams redirecting flow; walkways bend, dip, adapt.)

RT: This is not infrastructure as barrier. It's infrastructure as invitation. The river's right to biodiversity includes the beaver. The engineer of edge conditions. The slow choreographer of wetlands.

C: That's... radical. You're saying: rewild the river?

B: We're saying: let it build itself again, on top of all the strangeness. Let the beavers re-engineer what we destroyed. Not just protect-co-design. Floating lodges.Hybrid marshes. Human-beaver cooperation.



ACT V.DEVIATION/LET GO: THE RIGHT TO REGENERATE

Location: Hudson Riverbank near Poughkeepsie, NY

B: They moved grain. They moved lumber. They moved goods. And now? They move us.

C: These locks are industrial relics. 40 feet of mechanical elevation. Chambers of water discipline.

RT: But not now. Now they become rituals. Each lock, a floating sauna. A thermal descent.You enter hot, flushed. You cool as you go. (gestures) Five levels. Five temperatures.Five ways of letting go.

B: The opposite of commerce. A ceremony of stillness. You soak. You sweat. You descend.The canal doesn't move goods—it moves grief, joy, bodies.

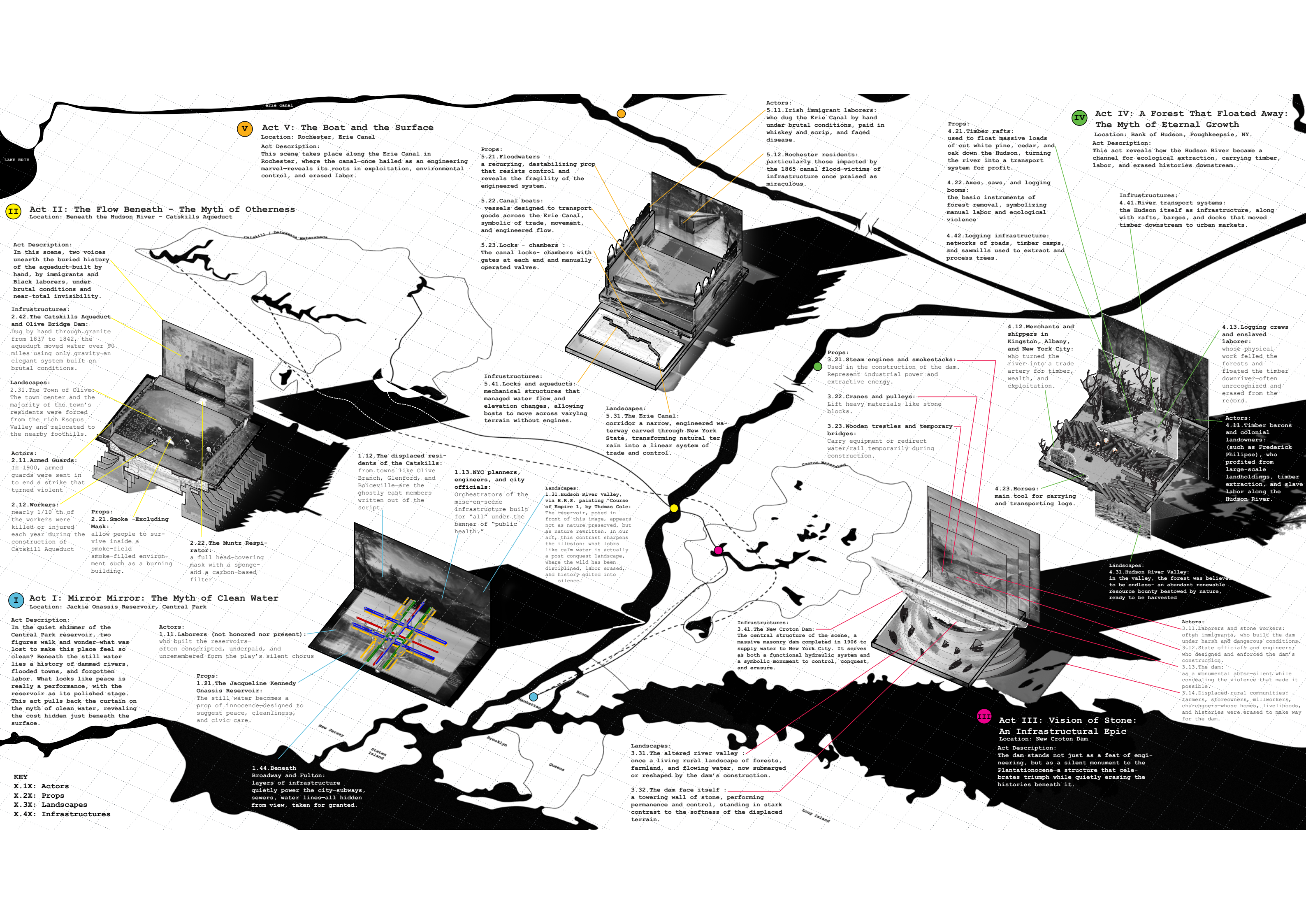
C: From barge to body. From lockstep to loose drift.

RT: The river performs differently now. Not as servant to markets, but as host to transition. Its right to function—not as passageway but as experience—is fulfilled.

B: At the bottom, you emerge. Lighter. Changed.

RT: Hydraulic lift becomes therapeutic rite. Lock becomes temple. Canal becomes passage.

RT: Not to ports, but to the next phase of dark ecology. The dark sweet kind.



V Act V: The Boat and the Surface
Location: Rochester, Erie Canal
Act Description:
This scene takes place along the Erie Canal in Rochester, where the canal—once hailed as an engineering marvel—reveals its roots in exploitation, environmental control, and erased labor.

II Act II: The Flow Beneath - The Myth of Otherness
Location: Beneath the Hudson River - Catskills Aqueduct

Act Description:
In this scene, two voices unearth the buried history of the aqueduct—built by hand, by immigrants and Black laborers, under brutal conditions and near-total invisibility.

Infrastructures:
2.42. The Catskills Aqueduct and Olive Bridge Dam:
Dug by hand through granite from 1837 to 1842, the aqueduct moved water over 90 miles using only gravity—an elegant system built on brutal conditions.

Landscapes:
2.31. The Town of Olive:
The town center and the majority of the town's residents were forced from the rich Esopus Valley and relocated to the nearby foothills.

Actors:
2.11. Armed Guards:
In 1900, armed guards were sent in to end a strike that turned violent

2.12. Workers:
nearly 1/10 th of the workers were killed or injured each year during the construction of Catskill Aqueduct

Props:
2.21. Smoke -Excluding Mask:
allow people to survive inside a smoke-filled environment such as a burning building.

2.22. The Muntz Respirator:
a full head-covering mask with a sponge and a carbon-based filter

I Act I: Mirror Mirror: The Myth of Clean Water
Location: Jackie Onassis Reservoir, Central Park

Act Description:
In the quiet shimmer of the Central Park reservoir, two figures walk and wonder—what was lost to make this place feel so clean? Beneath the still water lies a history of dammed rivers, flooded towns, and forgotten labor. What looks like peace is really a performance, with the reservoir as its polished stage. This act pulls back the curtain on the myth of clean water, revealing the cost hidden just beneath the surface.

Actors:
1.11. Laborers (not honored nor present):
who built the reservoirs—often conscripted, underpaid, and unremembered—form the play's silent chorus

Props:
1.21. The Jacqueline Kennedy Onassis Reservoir:
The still water becomes a prop of innocence—designed to suggest peace, cleanliness, and civic care.

1.44. Beneath Broadway and Fulton:
layers of infrastructure quietly power the city—subways, sewers, water lines—all hidden from view, taken for granted.

Props:
5.21. Floodwaters:
a recurring, destabilizing prop that resists control and reveals the fragility of the engineered system.

5.22. Canal boats:
vessels designed to transport goods across the Erie Canal, symbolic of trade, movement, and engineered flow.

5.23. Locks - chambers:
The canal locks—chambers with gates at each end and manually operated valves.

Infrastructures:
5.41. Locks and aqueducts:
mechanical structures that managed water flow and elevation changes, allowing boats to move across varying terrain without engines.

1.12. The displaced residents of the Catskills:
from towns like Olive Branch, Glenford, and Boiceville—are the ghostly cast members written out of the script.

1.13. NYC planners, engineers, and city officials:
Orchestrators of the mise-en-scène infrastructure built for "all" under the banner of "public health."

Landscapes:
1.31. Hudson River Valley, via H.R.S. painting "Course of Empire I, by Thomas Cole:
The Reservoir, posed in front of this image, appears not as nature preserved, but as nature rewritten. In our act, this contrast sharpens the illusion: what looks like calm water is actually a post-conquest landscape, where the wild has been disciplined, labor erased, and history edited into silence.

Landscapes:
5.31. The Erie Canal:
corridor a narrow, engineered waterway carved through New York State, transforming natural terrain into a linear system of trade and control.

Actors:
5.11. Irish immigrant laborers:
who dug the Erie Canal by hand under brutal conditions, paid in whiskey and scrip, and faced disease.

5.12. Rochester residents:
particularly those impacted by the 1865 canal flood—victims of infrastructure once praised as miraculous.

Props:
3.21. Steam engines and smokestacks:
Used in the construction of the dam. Represent industrial power and extractive energy.

3.22. Cranes and pulleys:
Lift heavy materials like stone blocks.

3.23. Wooden trestles and temporary bridges:
Carry equipment or redirect water/rail temporarily during construction.

Infrastructures:
3.41. The New Croton Dam:
The central structure of the scene, a massive masonry dam completed in 1906 to supply water to New York City. It serves as both a functional hydraulic system and a symbolic monument to control, conquest, and erasure.

Landscapes:
3.31. The altered river valley:
once a living rural landscape of forests, farmland, and flowing water, now submerged or reshaped by the dam's construction.

3.32. The dam face itself:
a towering wall of stone, performing permanence and control, standing in stark contrast to the softness of the displaced terrain.

IV Act IV: A Forest That Floated Away: The Myth of Eternal Growth

Location: Bank of Hudson, Poughkeepsie, NY.

Act Description:
This act reveals how the Hudson River became a channel for ecological extraction, carrying timber, labor, and erased histories downstream.

Props:
4.21. Timber rafts:
used to float massive loads of cut white pine, cedar, and oak down the Hudson, turning the river into a transport system for profit.

4.22. Axes, saws, and logging booms:
the basic instruments of forest removal, symbolizing manual labor and ecological violence

4.42. Logging infrastructure:
networks of roads, timber camps, and sawmills used to extract and process trees.

Infrastructures:
4.41. River transport systems:
the Hudson itself as infrastructure, along with rafts, barges, and docks that moved timber downstream to urban markets.

4.12. Merchants and shippers in Kingston, Albany, and New York City:
who turned the river into a trade artery for timber, wealth, and exploitation.

4.23. Horses:
main tool for carrying and transporting logs.

4.13. Logging crews and enslaved laborer:
whose physical work felled the forests and floated the timber downriver—often unrecognized and erased from the record.

Actors:
4.11. Timber barons and colonial landowners:
(such as Frederick Philipse), who profited from large-scale landholdings, timber extraction, and slave labor along the Hudson River.

Landscapes:
4.31. Hudson River Valley:
in the valley, the forest was believed to be endless—an abundant renewable resource bounty bestowed by nature, ready to be harvested

Actors:
3.11. Laborers and stone workers:
often immigrants, who built the dam under harsh and dangerous conditions.
3.12. State officials and engineers:
who designed and enforced the dam's construction.
3.13. The dam:
as a monumental actor—silent while concealing the violence that made it possible.
3.14. Displaced rural communities:
farmers, storeowners, millworkers, churchgoers—whose homes, livelihoods, and histories were erased to make way for the dam.

III Act III: Vision of Stone: An Infrastructural Epic

Location: New Croton Dam

Act Description:
The dam stands not just as a feat of engineering, but as a silent monument to the Plantationocene—a structure that celebrates triumph while quietly erasing the histories beneath it.

KEY
X.1X: Actors
X.2X: Props
X.3X: Landscapes
X.4X: Infrastructures



ACT V



ACT IV



ACT III



ACT II

Definition of Terms: In October 2014, in a conversation at the University of Aarhus, participants coined the term Plantationocene to describe the transformation of human-managed farms, pastures, and forests into extractive, enclosed plantations relying on slave labor and other exploited, alienated, and often spatially displaced labor. —Dona Haraway, *Environmental Humanities*, vol. 6, 2015, p. 152

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ACT I: THE STREAMS BENEATH US Location: Center & Leonard Street, Manhattan (Model: A gridded map with a luminous pond breaking through beneath pipes.)

B: You really don’t get it. We’re standing on history—on water. It’s not broken. It’s resurfacing.

C: The Viele Map. 1865. These ponds were overwritten by rationality. Infrastructure replaced landscape. That’s progress.

B: Yeah? Your progress is leaking.

RT: Ponds remember. So does marshland. Beneath the grid, the hydrology waits. You called it malfunction. I call it restoration—one that honors the river’s right to be restored.

(B gestures toward the model pond breaking through the gridded surface.)

B: Imagine—daylighting it. Letting the ponds come back. Not floods, not punishment. Pools. Parks. Public space that breathes.

RT: The streams surface not to protest, but to return. A dark ecology rising—uncanny, persistent. Water claims its place in the city’s body again.

ACT I

INTRODUCTION TO ACT III: THE CITY AS FOUNTAIN The Catskills Aqueduct, completed in 1915, carries clean mountain water to New York City. For over a century, this hidden network has run beneath streets and sidewalks—often unrecognized, always vital. But what if it did more than serve silently? What if it celebrated? In this act, the River Tribunal envisions a repurposing: the fire hydrant, historically a tool for emergencies, becomes a ritual of joy. Every ten feet, a hydrant becomes a fountain. A field of fountains. The park becomes a collective shower. This act grants the river the right to flow—not just in pipes or tunnels, but in public, as joy, as relief, as civic delight.

ACT III: THE CITY AS FOUNTAIN Location: A reimagined Harlem summer park, stone plinths separated by water pathways, gridded with hydrants every 10'. (Model: A plaza of hydrants, pathways lead to a central pool slowly filling from collected runoff.)

B: Forget scarcity. We have flow. The aqueduct runs full—and this time, it's not locked behind stone. It's opened to us. Every ten feet.

C: Hydrants were for emergencies. Controlled bursts. Wrenches and warnings. You're proposing... what, exactly?

B: A choreography. Of joy. Of cooling. Of collective pleasure. Hydrants turned fountains. Each one arcs into the air, falls into stone basins, and gathers.

RT: The aqueduct no longer ends in a valve. It ends in delight. A grid of relief. Water misting onto skin, bouncing off concrete, spiraling into celebration.

C: But it's potable water. Reservoir-fed. Protected.

B: Exactly. That's the point. We trust the aqueduct enough to drink from it. Now we trust it enough to dance with it.

RT: Collection basins gather the excess. Slowly, the water cools. It settles. It clarifies. And then?

B: It becomes a pool. A real one. A civic one. A public bath for the hottest months. The city becomes a fountain.

(RT gestures to the model: a pool formed by collection basins, where children wade, elders sit, and mist rises between hydrants.)

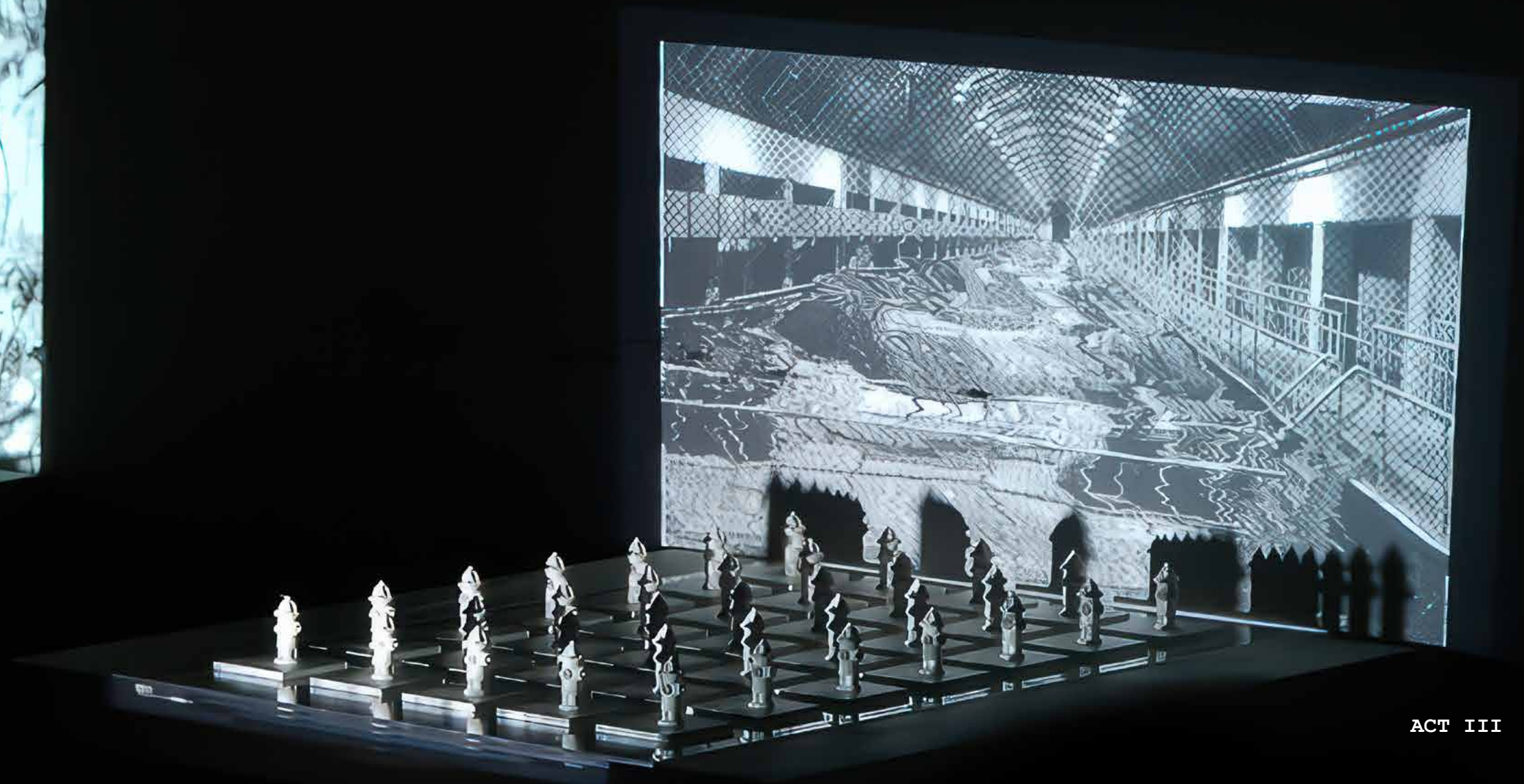
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RT: We've replaced emergency with emergence. The river's right to flow is made visible, audible, splashable.

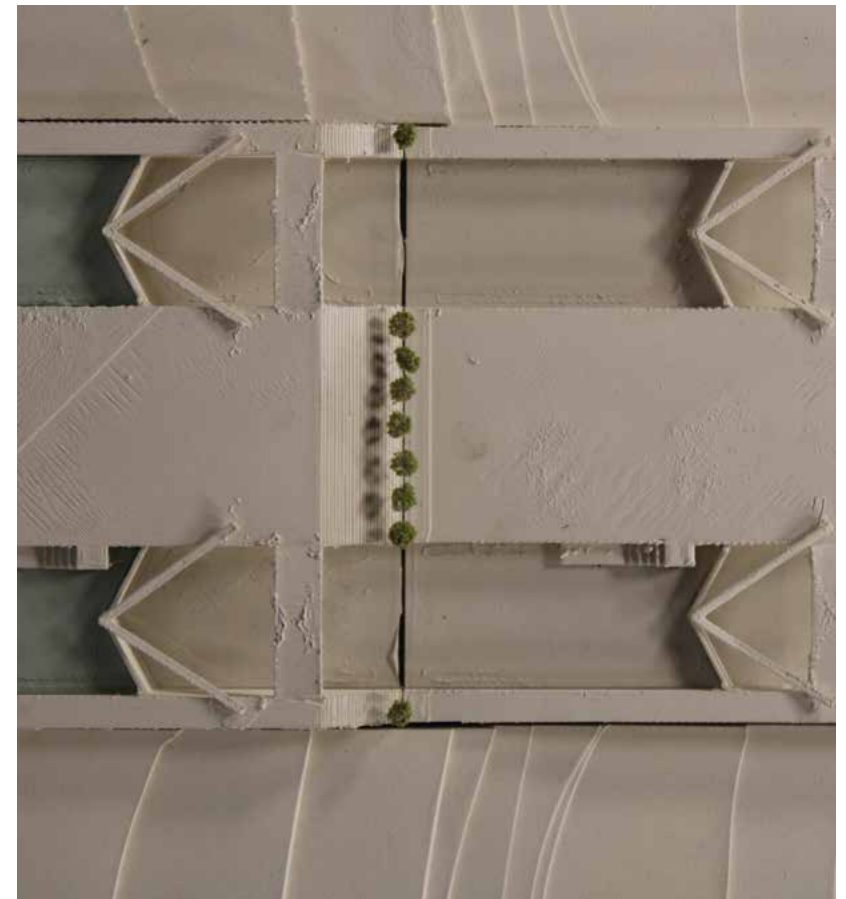
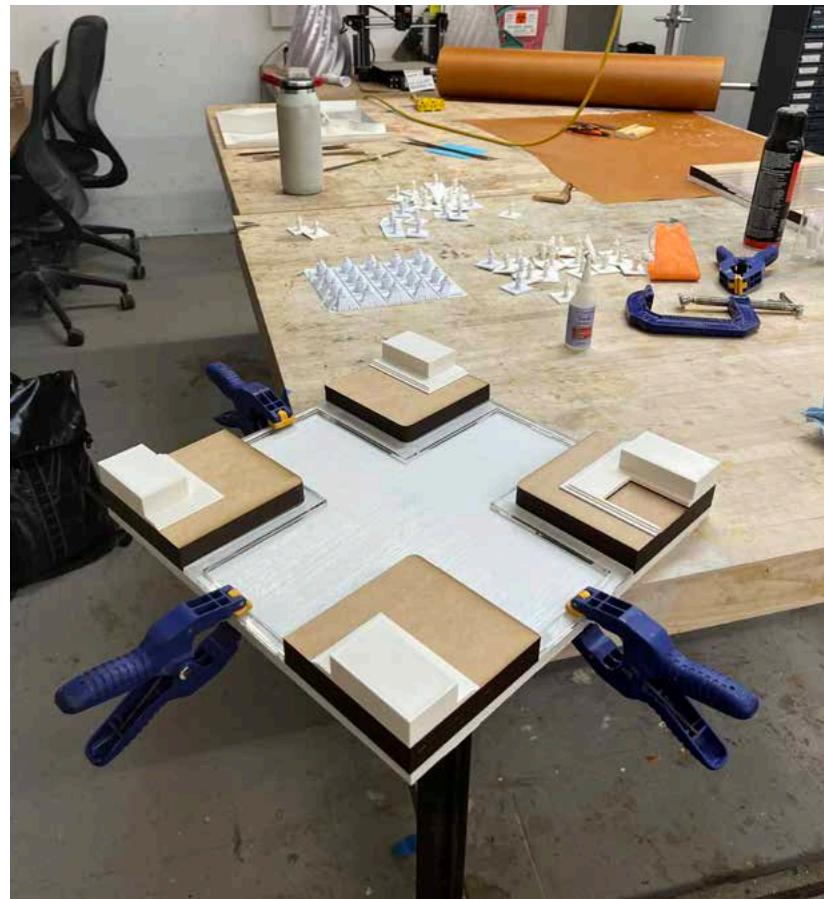
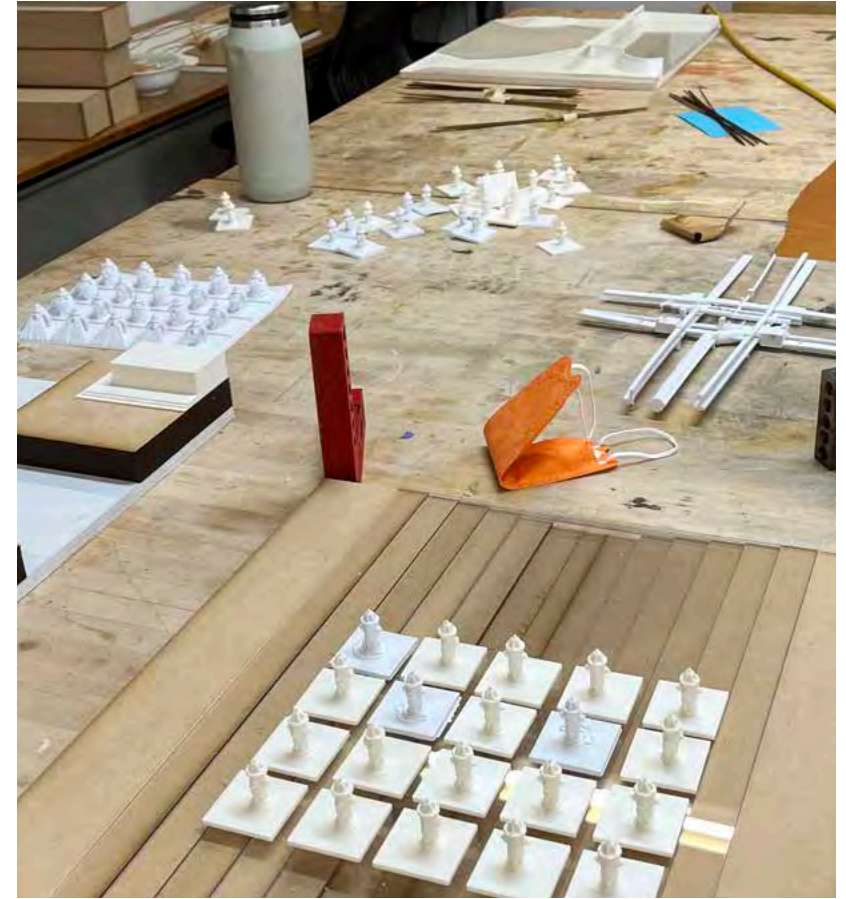
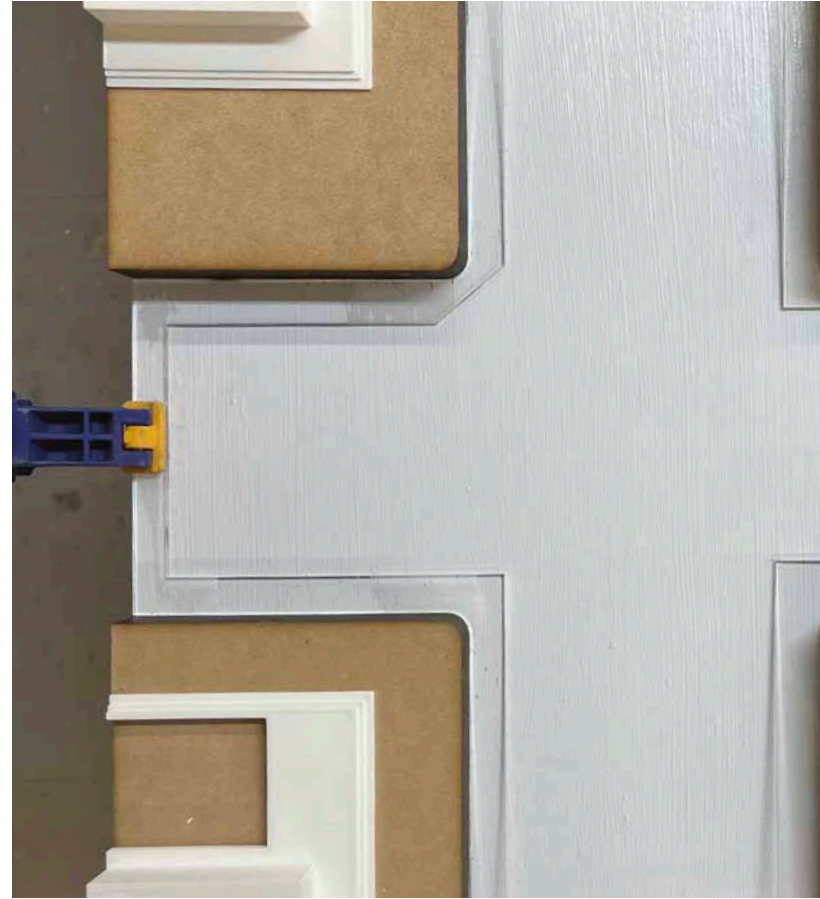
B: Not just infrastructure. Not just cooling. It's joy. That's the measure. We don't just use the aqueduct—we celebrate it.



ACT IV



ACT III



Final Paper

Construction Ecologies in the Anthropocene

Columbia GSAPP

Fall 2025

Professor: Tommy Schaperkotter



Tides roll in, tides roll out, and what do you know, this year \$13.4 million washed up on the shore, in the currency of sand – 348,000 cubic yards of it, pumped onto the beach from the U.S. Army Corps of Engineers’ dredging mission in East Rockaway Inlet.¹

If one were to consider an architectural material’s impact on New York City’s built environment, the ubiquitous lite of glass allows for an uncanny reflection: how did all of this happen? Glass, from initially being one of the most coveted commodities, has now covered the globe. Its transparency is both literal and metaphorical, its experience is indivisible to modern life, but its primary constituent, sand, remains unnoticed at best.

This is a march commensurate in geophysical scale and lacks the very transparency its material is so intrinsic to creating: glass panels for a contemporary city. To trace its machined impact throughout New York City, from manufacturing its beaches and enclosures, we realize there is an uncanny nature to this that is deeply tied to construction ecologies within the Anthropocene; it becomes weirder the more you zoom in.

¹ John Leland, “Why Giant Pipes (Intentionally) Spewed Water and Sand onto Rockaway Beach,” New York Times, May 24, 2019. Accessed October 24, 2023. <https://www.nytimes.com/2019/05/24/nyregion/rockaway-beach-sand.html>.

Figure 0. John Leland and Julia Gillard, “Why Giant Pipes (Intentionally) Spewed Water and Sand onto Rockaway Beach,” New York, the New York Times, May 24, 2019, <https://www.nytimes.com/2019/05/24/nyregion/rockaway-beach-sand.html>.



It is therefore uncanny that the very city in discussion – New York – is responsible for so much glass in its architecture and is also the one spending the most of any, city in the country to dredge sand onto its shores, with no intent to be noticed.¹³

More importantly, by identifying the material transformations between sand and glass, we will understand that the use of high-quality energy to accomplish this material phase change is intrinsic to an anthropocentric march in the name of (white, Western) health and prosperity. Sand, via glass, is inherently critical to the argument of this paper, but so too is the messaging that “light and air” are critical elements to health. This is an uncanny looping argument because it allows or permits a great deal of destroyed, dredged, mined, biosphere for public “health” and “vitality” in the workplace.

Said another way, by aiming to present and maintain a “beach” for recreation, NYC Parks has actually terraformed a completely different area of the coastline. It is thus the focus of the paper: to examine how – within the Anthropocene – the construction ecology of sand took hold via an analysis and critique of how modernity framed the very goal of its construction ecology – to make it fully transparent, not visible. Glass was a metaphor. Sand was never even there.

¹³ See Footnote 1 and Emily A. Wei, Jennifer L. Miselis, and Arnell S. Forde, Shoreface and Holocene Sediment Thickness Offshore of Rockaway Peninsula, New York. Open-File Report 2021-1100. U.S. Geological Survey, 2021. <https://doi.org/10.3133/ofr20211100>.

Figure 1. Children who stay in the city-Children who go to Rockaway, Advertising Card, c. 1900. Reproduced from, John Waldman and William Solecki, The Great Transformations Exploring Jamaica Bay in the Late 19th and Early 20th Centuries Through Newspaper Accounts, Natural Resource Report. NPS/NCRB/NRR-2018/1607 (Fort Collins, CO: National Park Service, U.S. Department of the Interior, March 2018). 42.

It is not uncommon for a glass curtain wall panel to be composed by nearly 75% “sand” (silica), yet the material in its architectural form is entirely unrecognizable, which directly speaks to the argument above – it was never meant to be recognized as the material in the first place.

Glass within the proliferation of the curtain wall became, then, only a metaphor. The metaphor became the vernacular. At the time, Ockman relates “freedom” and “democracy.”²¹ As we see above, the Architectural Review considered the metaphor one of “progress.” It was never about the material transformation of sand in a blast furnace, either, as the processes which combine to create glass are remarkably reliant on sand, high-quality energy, among other elements and compounds, a sequence of melting, cooling, treating that has been roughly unchanged for decades.²² The percentages vary between types of glass, and a typical concentration of silica sand ranges between 69-74% of total composition.

The percentage of sand is exactly 75% in an exemplary contemporary project’s curtain wall, The Spiral by BIG Architects, recently completed in Hudson Yards, NY.²³

²³ When speaking to the IGU supplier for the Spiral, Interpane, it was confirmed that the sand content was 75% and that the portions of raw material were highly scrutinized throughout the process of material production by the raw material supplier.

Figure 3. Table 1.2 Reproduced from Matthias Haidmann, Andreas Luible, and Mauro Overend, Structural Use of Glass (Ulrich International Association for Bridge and Structural Engineering, 2008), ISBN 978-3-85748-119-2. 5.

	Soda lime silica glass	Borosilicate glass	
Silica sand	SiO ₂	69-74%	70-87%
Lime (calcium oxide)	CaO	5-14%	-
Soda	Na ₂ O	10-16%	0-8%
Boron oxide	B ₂ O ₃	-	7-15%
Potassium oxide	K ₂ O	-	0-8%
Magnesia	MgO	0-6%	0-8%
Alumina	Al ₂ O ₃	0-3%	0-8%
Others		0-5%	0-8%

Table 1.2:
Chemical composition of
soda lime silica glass and
borosilicate glass, indicating
values (mass %) according
to [140] and [129].

Moreover, this was done with the messaging that glass itself was also all purpose. It was the perfectly modifiable agent for a real estate market looking to rebound from the global financial crash of 1929. As documented in John Stanislaw Sadar’s Through the Healing Glass,

“Vitaglass.developed different messages: for architects, Vitaglass offered labour savings and modernity; for industrialists, it offered the promise of increased productivity, health and vitality; for the trade, it offered increased margins; and for educators, health professionals and the general public, it offered a promise of year-round health benefits.”¹⁶

It was the all purpose machine of capitalism, using glass as its agent. This “vitality” was – and I would argue still is – not at the benefit of the worker. Referencing a selected quote discussed earlier in the term, “for Marx, as for other classical economists who followed Adam Smith [...] every economic good acquired its worth only because abstract human labour [was] objectified or materialized in it.”¹⁷ For office workers whose “service” is expressly for the direct benefit of the company employing the them, it is not for whom “increased productivity, health and vitality,” are intended. It is an asymmetrical relationship supporting the company under which they work.

¹⁶ John Stanislaw Sadar, Through the Healing Glass: Shaping the Modern Body through Glass Architecture, 1925-35 (New York: Routledge, 2016), 96.

¹⁷ William Cronon, Nature’s Metropolis: Chicago and the Great West (New York: W.W. Norton & Company, 1991), 149.

Figure 2. Advertisement from Architectural Review (01.1935). Reproduction from John Stanislaw Sadar, Through the Healing Glass: Shaping the Modern Body through Glass Architecture, 1925-35 (New York: Routledge, 2016), 1.



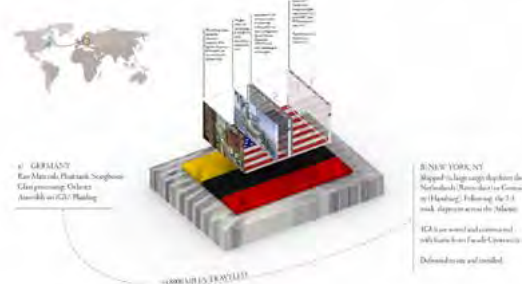
The Spiral as architecture can be read as something only seen in an extremely hyper-local way, accessible due to it being boxed in, in all directions, by curtain wall. In this condensing moment, “architecture . . . does not (or does not only) represent or ‘mirror’ late capitalism as its cultural equivalent. It belongs to late capitalism.”²⁵

We see this because when you walk on site, the district is not activated by the theatre, nor is it activated by the shopping center. It is activated by the fictitious capital of Hudson Yards, now intensely and rigorously the facade of the Spiral wants to say nothing of it, and just reflect beyond it.²⁶ Said another way, how noteworthy is the express intent of the design to connect the green space of the Highline. Its success is then defined by that reach outward beyond where it actually is.

This focuses the ultimate point of The Spiral whose architectural firm describes the importance of an “integration of nature,” as documented on BIG’s website. It becomes one of selection vs an embrace of the inherent complexities of such an acknowledgment. As written, “The Spiral promotes a contemporary workplace where nature becomes an integrated part of the office environment.”²¹

²¹ Bjarke Ingels Group, “The Spiral,” accessed November 16, 2023, <https://big.dk/projects/the-spiral-4456>.

Figure 4. The Spiral as described on BIG’s website. Bjarke Ingels Group, “The Spiral,” accessed November 16, 2023, <https://big.dk/projects/the-spiral-4456>.



What makes the project’s enclosure exemplary twice is its poetics of relation acting as the design concept – its relation qua metaphor is arguably not even local as the glass itself comes from Germany. What I mean by this is an interesting application of Édouard Glissant’s terminology surrounding the intransitive nature of the word relation (fr), and less the English translation implying an object as the basis of relationship. The relation, is non local.

As the logic builds, the glass is German, as is the sand that was melted to create it. It comes from an adjacent quarry next to Interpane’s facilities. Per Eduardo Rosa, the International Business Manager of Interpane, “all the glass was processed in Germany. From float supply to sealed IGU. It happened in three main different locations. Float tank, Seinghouse, glass processing, SGT Oelsnitz, and Assembly on IGU, Plattling.”²⁷ Every tower in Hudson Yards employs an IGU and a version of a curtain wall assembly. None of the sand in the glass is sourced locally to NYC. The glass is literally looking out from, and onto, a melted layer of the world.

This very question takes us to the end of the essay. Not by locating the sand in question (this would be impossible), but rather by pointing out that it was never intended to be seen. That is the whole “idea” of the curtain wall – to convince and remain convincing.

²⁷ This response was conducted over email with Eduardo Rosa, Interpane.

Figure 5. Diagram of primary sources of material, and labor. Produced by Author.

Final Paper
Construction Ecologies in the Anthropocene
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its semiotics.^{9,10} The reasoning for this is also tied back to public health via recreation. As Janda, Warrick et al. argue – it is through this never ending loop of recreation and beach maintenance that Rockaway continues to grow.

The shorelines along the western ends of these three beaches have been accreting at ~4 m/yr during the observation record (1884–2022) resulting from net westward longshore drift. The central 10–12 km of the beaches have lower shoreline change rates, and these rates are generally lowest within the groin fields (0.5–1.5 m/yr). Shoreline change observations also provide evidence for westward propagating accretion and erosion sediment waves that have durations of several years. Beach nourishment projects are shown to significantly influence rates of shoreline accretion, and this is commonly followed by significant shoreline retreat during the subsequent years.¹¹

Said another way, by aiming to present and maintain a “beach” for recreation, NYC Parks has actually terraformed a completely different area of the coastline. It is thus the focus of the paper: to examine how – within the Anthropocene – the construction ecology of sand took hold via an analysis and critique of how modernist framed the very goal of its construction ecology – to make it fully transparent, not visible. Glass was a metaphor. Sand was never even there.

It is well documented that the Human Species is a geophysical force that has machined material manipulations at such a vast scale that items such as architectural glass has become their own hyperobject.¹² And as such, it is completely unnoticed when you consider an enclosure, just as much as a beach. It is therefore uncanny that the very city in discussion – New York – is responsible for so much glass in its architecture and is also

Chris Smith
Final Paper
Construction Ecologies in the Anthropocene
Professor: Thomas Schaperkotter

The Allegory of Transparency:
Tracing the use of sand in New York City

Tides roll in, tides roll out, and what do you know, this year 113.4 million washed up on the shore, in the currency of sand – 145,000 cubic yards of it, pumped onto the beach from the U.S. Army Corps of Engineers’ dredging mission in East Rockaway Inlet.¹

About 5000 years ago the Mesopotamians discovered that when heated together (1400 °C), silicon, lime, sodium carbonate, potassium carbonate and metal oxides could be worked into a glassy mass. But this method was extremely complicated and so glass remained a coveted, rare commodity.²

“The Earth, has become once again, an agent of... our common geostory. The problem becomes for all of us in philosophy, science or literature, how do we tell such a story?”³

If one were to consider an architectural material’s impact on New York City’s built environment, the ubiquitous lite of glass allows for an uncanny reflection: how did all of this happen? Glass, from initially being one of the most coveted commodities, has now covered the globe. Its transparency is both literal and metaphorical, its experience is indivisible to modern life, but its primary constituent, sand, remains unnoticed at best.

By echoing Latour and pulling from Édouard Glissant, a study of glass and its material components creates an opportunity to understand how its materials are forced into transparency by a human machine exogenous to its own ecological poetics of relation. This is a transparency via humans as a geophysical

John Island, “Why Giant Pipes (Intentionally) Speeded Water and Sand onto Rockaway Beach,” *New York Times*, accessed October 14, 2025. <https://www.nytimes.com/2019/05/24/nyregion/rockaway-beach-sand.html>.

Schittich, Christian, Brad, Gerald, Bellow, Dieter, Schuler, Matthias and Siebel, Werner. *Glass Construction Manual*. Munich: Birkhäuser, 2007. https://doi.org/10.1007/978-3-0346-0154-0_10.

Ghosh, Rana, and El Said Jassry. *Geostories: Another Architecture for the Environment*. Cambridge, MA: Harvard University Graduate School of Design, 2018.

the one spending the most of any city in the country to dredge sand onto its shores, with no intent to be noticed.¹³

It’s impossible to see, yet remarkable in its overwhelming ubiquity in modern life. Through its manifest extraction and production techniques, we encounter a fundamental myth of a perceived endless resource, one infinitely modifiable to the desire of the human species and the markets it creates. However, as we have seen in this class’s discussion and readings, the complexity of the built environment is best understood, paradoxically, by the point humans have reached since the development of the steam engine.

They have tried to remove complexity from the built environment and instead of creating less complexity, are now deeply entangled in a series of hybrid relationships between the human and the non-human. It is summed up via Bruno Latour’s argument within *We Have Never Been Modern*:

The essential point of this modern Constitution is that it renders the work of mediation that assembles hybrids invisible, unthinkable, unrepresentable. Does this lack of representation limit the work of mediation in any way? No, for the modern world would immediately cease to function. Like all other collectives it lives on that blinding. On the contrary (and here the beauty of the mechanism comes to light), the modern Constitution allows the expanded proliferation of the hybrids whose existence, whose very possibility, it denies.¹⁴

This has come at a disastrous cost to the biosphere. This is a living biosphere that is on a continuum of geological time but has been affected heavily by anthropocentric fallout beginning with the steam engine in 1784 (patented by James Watt). Through the application of an engine with numerous and multiple uses, the human now exists as a terraforming agent. The composition of the biosphere literally changes due to the scale of its application, and the raw materials which power and embody the engine shrink to a scale of least noticed importance. Interestingly, it is thus reflected in the language of the patent that it is an “all-purpose machine.” Morton elucidates

“factory for white-collar workers.”¹⁵ The Spiral as architectural can be read as something only seen in an extremely hyper-local way, accessible due to it being boxed in, in all directions, by curtain wall. In this condensing moment, “architecture . . . does not . . . of the curtain wall assembly. None of the sand in the glass is sourced locally to NYC. The glass is literally looking out from, and onto, a melted layer of the world.

We see this because when you walk on site, the district is not activated by the theatre, nor is it activated by the shopping center. It is activated by the *fictional* capital of Hudson Yards, how intensely and rigorously the facade of the Spiral wants to say nothing of it, and just reflect beyond it.¹⁶ Said another way, how noteworthy is the express intent of the design to connect the green space of the Highline. Its success is then defined by that reach outward beyond where it actually is.

What makes the project’s enclosure exemplary twice is its poetics of *relation* acting as the design concept – its relation qua metaphor is arguably not even local as the glass itself comes from Germany. What I mean by this is an interesting application of Édouard Glissant’s terminology surrounding the intransitive nature of the word *relation* (*fr*), and less the English translation implying an object as the basis of relationship. The relation, is *non* local.

This not only aligns with Timothy Morton’s definition of a hyperobject, but speaks to something more abstract and interesting. As the logic builds, the glass is German, as is the sand that was melted to create it. It comes from an adjacent quarry next to Interpane’s facilities. Per Eduardo Rosa, the International Business Manager of Interpane, “all the glass was

processed in Germany. From float supply to sealed IGU. It happened in three main different locations. Float tank, Seingbouse, glass processing, SGT Oelnitz, and Assembly on IGU, Plattling.”¹⁷ Every tower in Hudson Yards employs an IGU and a version of a curtain wall assembly. None of the sand in the glass is sourced locally to NYC. The glass is literally looking out from, and onto, a melted layer of the world.

The relation of this product is, of course, bound in a market where land and buildings are bought, sold, rented, or simply a basis of some type of capital transaction. Zadie Smith reminds us that “some of the most expensive air one can breathe is found in Manhattan, NY,” and this is no less true for a glass curtain wall found in the Hudson Yards.¹⁸ How rhizomatic. The relation of the glass to its surroundings is, therefore, strictly controlled by what the market of contemporary real estate can absorb (transact). How rooted. What is so fascinating about this is how the glass has a “similarity of difference,” and how that came to exist as an extensive relationship between the supplier, Interpane, and the Architect, BIG, alongside the Ownership group of Tishman Spier.

To view the coating applied to the primary enclosure (not the terraces), IPASOL PLATIN 47/29 was applied to face 2 of the IGU (Insulated Glass Unit). Its description on its product submittal is “silver.”¹⁹ Platin is a trade name of Interpane’s finish which is referred to as a “soft coat.” A Magnetron Sputter Vacuum Deposition (MSVD) (“soft coat”) process, [...] applies a thinner, multi-layer coating in a vacuum chamber to pre-cut glass, resulting in a higher-performance coating that is less durable and must be used in sealed, insulated units.”²⁰ Its result appears nearly like metal. The glass on the spiral is, interestingly, far more like a metallic object than the adjacent towers when seen in daylight.

force’ whereby suddenly one can see an anthropomorphic connection between a city (New York) dredging (or for a stronger term, “barfing,” from a wonderful thesis by Sabina Sethi Unni) hundreds of thousands of tons of sand onto the shores of its beaches, multiple times a decade, for over a century, with no indication of discontinuation.³

Figure 1. Children who stay in the city-children who go to Rockaway. Advertising Card, c. 1940. Reproduced from John Waldman and William Solecki, *The Great Transformation: Exploring Jamaica Bay in the Late 19th and Early 20th Centuries Through Newspaper Accounts, Natural Resource Report NPS/HCNM/NRM-2018/1607* (Fort Collins, CO: National Park Service, U.S. Department of the Interior, March 2018). 42.

This is a march commensurate in geophysical scale and lacks the very transparency its material is so intrinsic to creating: glass panels for a contemporary city. To trace its machined impact throughout New York City, from manufacturing its beaches and enclosures, we realize there is an uncanny nature to this that is deeply tied to construction ecologies within the Anthropocene; it becomes weirder the more you zoom in.

It becomes an exemplary point of what has been termed “Dark Ecology.” There are many debates which

Figure 2. Advertisement from *Architectural Review* (1937). Reproduction from John Stanislav Sadar, *Through the Healing Glass: Shaping the Modern Body through Glass Architecture, 1925–35* (New York: Routledge, 2016). 1.

Timothy Morton, *Dark Ecology: For a Logic of Future Coexistence* (New York: Columbia University Press, 2016). 20–23.

See pages 10 and 81. Sabina Sethi Unni, *Non-Reliant Neoliberalism: Informal Land Stewardship as Climate Contemplating in Rockaway, Or, This Could Be Ours* (Master’s Thesis, Columbia Graduate School of Architecture, Planning and Preservation, May 5, 2023).

this further by reminding us this has immensely foreshadowed our relationship with capitalism.

“[I]t was precisely what precipitated the industrial age...this universal machine could be connected to vast assemblages of other machines to supply their motive power, thus giving rise to the assemblages of assemblages that turnt be industrial age into a weird cybernetic system...industrial capitalism, with the vampire-like downward causality of the emergent machine level, with its related machine like qualities of ‘abstract value, sucking away at the humans on the levels beneath.”²¹

Moreover, this was done with the messaging that glass itself was also all purpose. It was the perfectly modifiable agent for a real estate market looking to rebound from the global financial crash of 1929. As documented in John Stanislav Sadar’s *Through the Healing Glass*,

Vitaplasta...developed different messages: for architects, Vitaplasta offered labour savings and modernity for industrialists, it offered the promise of increased productivity, health and vitality for the trade, it offered increased margins and for educators, health professionals and the general public, it offered a promise of year-round health benefits.²²

It was the all purpose machine of capitalism, using glass as its agent. This “vitality” was – and I would argue still is – not at the benefit of the worker. Referencing a selected quote discussed earlier in the term, “For Marx, as for other classical economists who followed Adam Smith [...] every economic good acquired its worth only because abstract human labour [was] objectified or materialized in it.”²³ For office workers whose “servitude” is expressly for the direct benefit of the company employing the them, it is not for whom “increased productivity, health and vitality,” are intended. It is an asymmetrical relationship supporting the company under which they work.

When the quote above is viewed from Morton’s reference point, it becomes a clear counterpart to the steam engine, further enhanced when one considers glass as a component within the assemblage of the curtain wall assembly. As Joan Ockman argues,

encompass Rockaway Beach⁴ and not least is a very real (and strange) question of what is actually innate to its ecology, with a manufactured maintenance program that is the most expensive in the country.⁵ More importantly, by identifying the material transformations between sand and glass, we will understand that the use of high-quality energy to accomplish this material phase change is intrinsic to an anthropocentric march in the name of (white, Western) health and prosperity. Sand, via glass, is inherently critical to the argument of this paper, but so too is the messaging that “light and air” are critical elements to health. This is an uncanny looping argument because it allows or permits a great deal of destroyed, dredged, mined, biosphere for public “health” and “vitality” in the workplace.

The paper then becomes allegorical in the sense that there are different faces of glass this argument will run through. First, by initially focusing on this terraformed history of Rockaway Beach, Queens, NY. It is here that we see an anthropomorphic loop of sand via maintenance, and glass via commodity. It arrives first in the early decades of the 19th century (1816 for maintenance at Rockaway) and follows in 1954 with the proliferation of the American Curtain Wall, notably in the Lever House by SOM.⁶ These two seemingly unconnected events share the same common foundation upon which the Anthropocene and its thinking took hold primarily because they circulate around the idea of “human vitality.” As we can see in the following two images (Figure 1 and 2), that word also becomes one reliant on

See Footnote 5 for a thorough analysis of these debates around Urban Renewal, Lack of Land Access, Zoning, policing of vacant lots – all of which define the Rockaways as a liminal zone with a curly but real dialectic between “east” and “west” side that is directly tied to the anthropological outcomes these two distinctly embody. Sabina’s full thesis is here: Sabina Sethi Unni, *Non-Reliant Neoliberalism: Informal Land Stewardship as Climate Contemplating in Rockaway, Or, This Could Be Ours* (Master’s Thesis, Columbia Graduate School of Architecture, Planning and Preservation, May 5, 2023).

I borrow this term from the start of a wonderfully constructed argument around “apologetics” built out by Timothy Morton in *Dark Ecology*... a book I am grateful exists. For the complete argument, see Timothy Morton, *Dark Ecology: For a Logic of Future Coexistence* (New York: Columbia University Press, 2016). 42.

Joan Ockman, “Toward a Theory of Normative Architecture,” in *Architecture of the Everyday*, ed. Steven Harris and Dobrosz Berke (Princeton Architectural Press, 1997). 132.

while it was initially considered as a metonym of “the mess that is man-made America” (from the perspective of a ‘new humanist’ sentimentality existing in 1950s England), by 1957 the perspective became inverted. Through the embrace of an American “bureaucracy and genius,” the “dynamism and prosperity” of its former colony was celebrated as a near vernacular movement of late modernism, entirely embodied by the curtain wall.¹⁸ As the *Architectural Review* writes in 1957,

The curtain wall is the first sign of such a discipline presenting itself to modern architecture and being generally accepted.”“Only a very brief look at the situation here [Britain] and in America is enough to show that where the architect gains respect and raises his status, he does so by delivering the goods and what is more, delivering them on time, the goods in this case being efficient, economical, watchlight, comfortable, and good-looking buildings.”¹⁹

Its presence [that of the curtain wall] has allowed the “engine” of late modernism to exist on a continuum of material ignorance whose mechanized procedures completely dissolve out of the final product. Arguably, it is not even the nameless worker experiencing these “benefits” either. Of all the components that were written about as successful examples of this type of late modernism, the material as glass (with no reference to its raw material composition, naturally) was to disassociate from the form entirely. As Ockman further argues,

The level of mastery and generalization it achieved could hardly have been anticipated from the isolated realizations of its precursors. In the sophisticated and often beautifully articulated buildings the glass “houses” of the 1950’s, repository of modernist culture’s most utopian hopes, was transformed into a fully embodied expression of advanced capitalism, corporate bureaucracy and big business.²⁰

It is not uncommon for a glass curtain wall panel to be composed by nearly 75% “sand” (silica), yet the material in its architectural form is entirely unrecognizable, which directly speaks to the argument above – it was never meant to be recognized as the material in the first place.

Glass within the proliferation of the curtain wall became, then, only a metaphor. The metaphor became the vernacular. At the time, Ockman relates “freedom” and “democracy.”²¹ As we see above, the *Architectural Review* considered the metaphor one of “progress.” It was never about the material transformation of sand in a blast furnace, either, as the processes which combine to create glass are remarkably reliant on sand, high-quality energy, among other elements and compounds, a sequence of melting, cooling, treating that has been roughly unchanged for decades.²² The percentages vary between types of glass, and a typical concentration of silica sand ranges between 69–74% of total composition.

	Sand	Other glass	Percentage
White sand	SiO ₂	69–74%	70–67%
Dark sand	SiO ₂	5–14%	–
Dark sand	SiO ₂	10–15%	0–4%
Dark sand	SiO ₂	1–10%	–
Dark sand	SiO ₂	0–4%	–
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Figure 3. Table 1.2 Reproduced from Matthias Heidmann, *Andrew Curtis, and Heidi Jassry. Structure: Use of Glass* (Columbia: International Association for Bridge and Structural Engineering, 2018). ISBN 978-0-95746-119-3. 5.

The percentage of sand is exactly 75% in an exemplary contemporary project’s curtain wall, The Spiral by BIG Architects, recently completed in Hudson Yards, NY.²³ What makes it exemplary is first its connection to finance, and specifically its maximal approach to optimizing it: both the “work” that the glazing does, but also the form and use of the High Rise Office Tower itself, which can be described as a

¹ Claire Simmerman, “Chapter 3 ‘Capitalist Recovery’ and the Daylight Auto Factory” in *Struggles in the Concrete: Architecture and the Marxist Tradition* edited by Mark Cinnamon and Luisa Lorenza Curcio, (Ft+B, Berlin, Boston: Birkhäuser, 2023). https://doi.org/10.1007/978-0-312-09494-0-04_47.

² Reinhold Martin, *Utopia’s Ghost: Architecture and Postmodernism*, Agnès, Minneapolis: University of Minnesota Press, 2010. 106.

³ For a detailed description of how a furnace is built refer to the following handbook: Ray V. (Ray Vallée) Tolley, *The Handbook of Glass Manufacture – A Book of Reference For the Plant Executive, Technologist, and Engineer* / Compiled and Edited by Ray V. Tolley (Bosch for Industry, 1974). 257–259.

⁴ When speaking to the 120 supplier for the Spiral, Interpane, it was confirmed that the sand content was 75% and that the portions of raw material were highly scrutinized throughout the process of material production by the raw material supplier.

¹³ This response was conducted over email with Eduardo Rosa, Interpane.

¹⁴ Zadie Smith, *Paul Feyer: Essays* (Penguin Press, 2018). 422–424.

¹⁵ This was confirmed by the Supplier. For data submittal please reference, AGC INTERPANE Glasgewallhaft mbH, *Performance Data for Low E and Solar Control Glass* (Plattling, Germany: AGC INTERPANE, April 2018). 12, accessed November 14, 2025, <https://www.agc-interpane.com/wp-content/uploads/2025/03/AGC-INTERPANE-Product-EN-web.pdf>.

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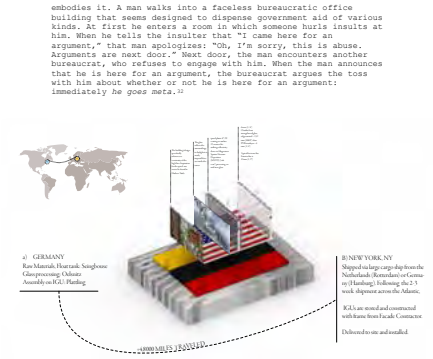
Figure 4. The Spiral as described on BIG’s website. Späke Ingels Group, “The Spiral,” accessed November 14, 2025, <https://big.dk/projects/the-spiral-1414>.

This focuses the ultimate point of The Spiral whose architectural firm describes the importance of an “integration of nature,” as documented on BIG’s website. It becomes one of selection vs an embrace of the inherent complexities of such an acknowledgment. As written, “The Spiral promotes a contemporary workplace where nature becomes an integrated part of the office environment.”²⁴ How fascinating to consider the fact that every single part of this picture is in relation to its own raw materials, their very poetics, and not least the curtain wall, whose sand material traveled over 4,800 nautical miles to arrive on site, whose only purpose was never to be seen.

This very question takes us to the end of the essay. Not by locating the sand in question (this would be impossible), but rather by pointing out that it was never intended to be seen. That is the whole “idea” of the curtain wall – to convince and remain convincing. Morton again points out this relationship to modernity.

Anything you can do, I can do meta.” Isn’t this the maxim of modernity? Being right in philosophy has most often been a case of going meta. Henry Ayton’s “Argument” slouch almost perfectly

¹⁸ Späke Ingels Group, “The Spiral,” accessed November 14, 2025, <https://big.dk/projects/the-spiral-1414>.



I can think of no better way to explain the current mindset needed to contextualize and produce good work in Hudson Yards, NY.

²¹ Timothy Morton, *Hyperobjects: Philosophy and Ecology after the End of the World*, Cary Wolfe Series Editor (Minneapolis: University of Minnesota Press, 2013), 146. As you will find the Footnote 25 within the Hyperobject is referencing this episode of Monty Python.

²² Joan Clewse and Graham Chapman, “The Argument of ‘The Flying Circus,’” *The Monty Python’s*, section 3, episode 3 (November 2, 1971).

Columbia GSAPP 2025
A4006_001_ Advanced Architectural Design Studio. **Spring 2026**

Professors: Harold Fallon, Phu Hoang, Emily Ruopp
Teaching Associate: Javier Flores Leal
Re-Consider, Re-Member, Re-Live

IMAGES:

¹ Andrew C. Fortier et al., "CALIBRATING AND REASSESSING AMERICAN BOTTOM CULTURE HISTORIES," Southeastern Archaeology 25, no. 2 (2006): 170-211, JSTOR.

² Douglas H. MacDonald, Montana Before History: 11,000 Years of Hunter-Gatherers in the Rockies and Great Plains (Missoula: Mountain Press Publishing Company, 2012), 59-116; George C. Frison, Prehistoric Hunters of the High Plains, 2nd ed. (San Diego: Academic Press, 1991).

³ "Montana Buffalo," accessed February 25, 2026, <https://arc.lib.montana.edu/picture-collection/item.php?id=135>.

⁴ "The Command. Chief Kootata next to a River," Montana History Portal, accessed February 25, 2026, <https://www.mtmemory.org/node/view/15270>.

⁵ "Kootenai Teepee Camp," Montana History Portal, accessed February 25, 2026, <https://www.mtmemory.org/node/view/11142>.

⁶ "Train in Gallatin Valley," accessed February 25, 2026, <https://arc.lib.montana.edu/picture-collection/item.php?id=634>.

⁷ "Bozeman, Mont., Metropolis of the Famous Gallatin Valley," accessed February 25, 2026, <https://arc.lib.montana.edu/picture-collection/item.php?id=56>.

¹ Michael B. Waters et al., "The Anzick Clovis Burial in Montana," Proceedings of the National Academy of Sciences 111, no. 31 (2014): 11208-11213; Douglas H. MacDonald, Montana Before History: 11,000 Years of Hunter-Gatherers in the Rockies and Great Plains (Missoula: Mountain Press Publishing Company, 2012).

² Douglas H. MacDonald, Montana Before History: 11,000 Years of Hunter-Gatherers in the Rockies and Great Plains (Missoula: Mountain Press Publishing Company, 2012), 59-116; George C. Frison, Prehistoric Hunters of the High Plains, 2nd ed. (San Diego: Academic Press, 1991).

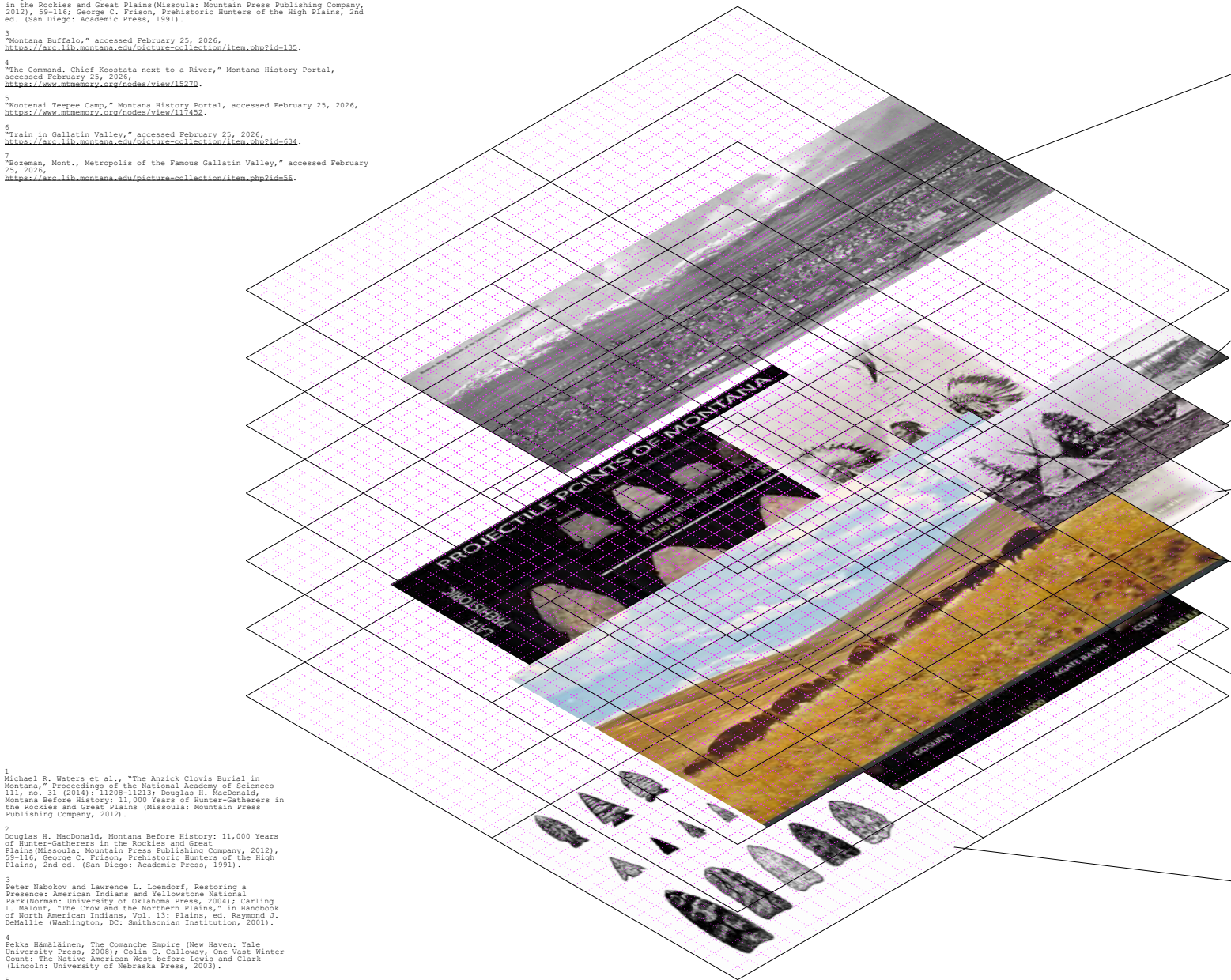
³ Peter Nabokov and Lawrence L. Loendorf, Restoring a Presence: American Indians and Yellowstone National Park (Norman: University of Oklahoma Press, 2004); Carling F. Malouf, "The Crow and the Northern Plains," in Handbook of North American Indians, Vol. 13: Plains, ed. Raymond J. DeMallie (Washington, DC: Smithsonian Institution, 2001).

⁴ Pekka Hämiläinen, The Comanche Empire (New Haven: Yale University Press, 2008); Colin G. Calloway, One Vast Winter Count: The Native American West before Lewis and Clark (Lincoln: University of Nebraska Press, 2003).

⁵ Michael P. Malone, Richard B. Roeder, and William L. Lang, Montana: A History of Two Centuries, rev. ed. (Seattle: University of Washington Press, 1991).

⁶ Richard White, Railroaded: The Transcontinentals and the Making of Modern America (New York: W.W. Norton, 2011); Malone, Roeder, and Lang, Montana.

⁷ Harold K. Steen, The U.S. Forest Service: A History (Seattle: University of Washington Press, 2004).



Federal Conservation & Amenity Landscape (1905–Present)

The creation of the Gallatin National Forest (1905) reframed the region as managed federal land. By the 20th century, tourism infrastructure (e.g., Gallatin Gateway Inn, 1927) positioned the valley as recreational wilderness – layered atop deeper Indigenous histories that are only recently being more publicly acknowledged.⁷

Railroad Terminus & Ranching Frontier (1880s–1920s)

The Northern Pacific Railroad established Salesville (later Gallatin Gateway) in the 1880s as a Yellowstone gateway. The valley transitioned into a ranching and tourism economy, formalizing private property boundaries over previously mobile landscapes.⁶

Treaty Era & Military Conflict (1850s–1870s)

Mid-19th-century treaties (including the 1855 Hellgate Treaty) and subsequent military campaigns restructured Indigenous access to southwest Montana. The Gallatin Valley shifted from Indigenous hunting grounds to settler-controlled territory within a generation.⁵

Horse Era & Regional Power Shifts (1700s–mid-1800s)

The arrival of the horse transformed mobility, warfare, and hunting economies across the northern Plains and Rockies. Control over corridors like Gallatin Canyon intensified as equestrian nations expanded their territorial influence.⁴

Intertribal Seasonal Landscape (ca. 500 BCE–1700s CE)

Before Euro-American settlement, the Gallatin Valley functioned as a shared and contested hunting corridor used by ancestors of the Apsáalooke (Crow), Salish, Blackfeet, and Shoshone peoples. Territoriality was fluid, negotiated, and ecological rather than bounded in the modern sense.³

Archaic Adaptation (ca. 8,000 BCE–500 BCE)

As climate stabilized, human groups diversified subsistence strategies – hunting elk, deer, and bison, and intensifying plant use. Valleys like the Gallatin likely became repeated seasonal nodes within broader migratory circuits.²

Glacial Opening & First Peoples (ca. 13,000+ BP)

As the Cordilleran Ice Sheet retreated, the northern Rockies opened as a migration corridor. Archaeological evidence from Montana (including Clovis-associated burials such as Anzick) demonstrates human presence in the region by ~13,000 years Before Present. The Gallatin corridor would have functioned as a mobile hunting landscape linking plains and mountains.¹

“In the anthropocene, the divide between nature and culture is blurred to the point of no return... Such frameworks endorse techno-biological approaches and design interventions for the creation of multispecies environments that are viable for all life forms, not just human beings.”

— Lydia Kallipoliti, Histories of Ecological Design: An Unfinished Cyclopediap. 214.

“To call a river alive is not to personify a river, but instead further deepen and widen the category of life.”

— Robert Macfarlane, Is a River Alive?, First edition...signed copy from Pioneer Works lecture (W.W. Norton & Company, 2025). 82.

These projects are organized around the understanding that architecture participates in living systems whose boundaries exceed the building itself. Wind patterns, flowering cycles, runoff, soil conditions, migration routes, maintenance regimes, ritual gatherings, and material afterlives all shape the spaces humans occupy. Architecture, therefore, with the relations already present on a site. The work presented examines how architecture can operate within these conditions through attention to atmosphere, species, infrastructure, and time. Each project is grounded in a specific geography and develops from the agencies already active there.

In Guancora, El Salvador, a community gathering place is renewed through planting systems, local timber structures, shade, and ceremonial paths that allow memory to be carried through seasonal growth and collective use. In Montana, a house is shaped by prevailing winds, snow drift, and creek hydrology, where domestic life is understood as part of larger climatic and watershed cycles. In Brussels, an obsolete office block is transformed into an urban habitat where work, dwelling, birds, pollinators, planted systems, and water reuse are brought into new forms of coexistence.

The projects share an interest in environmental forces that are often treated as background conditions. Wind becomes a spatial organizer. Snow accumulation becomes seasonal insulation and water storage. Plant succession becomes a calendar of return. Openings in a façade become nesting cavities, pollinator chambers, ventilation inlets, and light wells. Water is not simply supplied and drained, but slowed, stored, filtered, and returned. In each case, architecture is understood as a medium through which multiple forms of life and matter meet. This approach also requires attention to scale. Large ecological questions are often encountered through modest assemblies: a timber post set under an existing roof naturally oxidizes and decays - it will need community attention, care and maintenance, a swale cut to redirect runoff, a bird cavity set within precast opening, a terrace planted for shade and pollination, a roof edge angled to catch drifting snow. These precarious details requiring care, are where those architectural systems of relation become most legible and inhabitable. They are, I argue, where we can find solutions in this strange world of immense love, alongside economic and ecological ruin.

The work is informed by writers who describe relation as ecological, political, and material. Their arguments support a practice attentive to plurality, situated knowledge, and reciprocal dependence. Through their guidance and the work of my studio professors, my teammates for 2/3 of the projects, the work understands itself as an evolving framework capable of hosting changing uses, climates, and species over time. What emerges across the portfolio is a consistent proposition: architecture can widen the field of who and what is considered in design. Buildings can participate in watershed repair, support pollination and migration, register seasonal cycles, and create settings for collective life. They can make visible forms of interdependence that already exist, and give them durable spatial expression.

Project 1: Wilson Creek House

How is the hybrid nature of human and non-human life grounded in relation in rural Montana? The question emerges from a landscape often understood as open, remote, and separate from the dense infrastructures associated with metropolitan life. Fields extend toward mountain ranges, seasonal creeks move through ranchland, and settlement appears dispersed. Yet this apparent simplicity conceals a layered condition shaped by irrigation withdrawals, altered watershed flows, road networks, changing fire regimes, atmospheric instability, and climatic systems operating across scales far beyond immediate perception. Rural space is not outside the Anthropocene.

It is one of the places where its entanglements are most legible. This project begins by accepting that habitation already occurs within systems larger than the house itself. Human dwelling is inseparable from wind patterns, snow accumulation, creek hydrology, animal movement, land management practices, and planetary climate processes. The task of architecture is therefore not to restore an imagined untouched nature, but to work constructively within conditions of interdependence already in place—for both human and non-human life.



Questions to Mark and Betsy

11th of February,
2026

BETSY:

Daily Rituals:

When you think of being at WC, currently, how does your day progress?

Usually starts with chores... Walk Rae, feed Leo & clean out the litter-box, clean out the fireplace, start a load of wash, shower then off to work. Coming home is always the best part of the day. On non work days it's a lot of the same except slower. I try to get outside as much as possible with longer walks with Rae & in town for errands, friends & appointments. Seasons change outside with snow shoveling vs gardening vs reading

Do you find that
each day is simi-
lar?

Sort of...the morn-
ings are

What days are repetitive? Are there days that start similar, but end unexpectedly?

Work days are similar, off days vary a lot. Friends come over, appointments, projects with Dad

Do these change
with seasons?

Yes

How have these rituals evolved over the decades that you have lived at Wilson Creek?

We love doing projects outside together but they aren't as huge as what we used to take on.

How do you anticipate those needs evolving?

Age & bodies have
slowed us down
more

House | Daily Rituals

Does the house
support these rit-
uals or daily pat-
terns?

Yes - how?

Somewhat... the ba-
sics

No - how?

The kitchen makes cooking together difficult, being cramped. We don't have any space to entertain friends or just hang out together comfortably.

How do you envision the addition to the house supporting these patterns?

Bigger kitchen & a

living room to sit
together, watch a
movie comfortably
together, read to-
gether would be
such a treat

What type of patterns do you want to see introduced? Do you want more informal / casual hang-out space?

A place to work-out would be a treat as well as cooking together & relaxing together...more together spaces and a casual hang-out space.

Or more space defined as a room?
(study / library / etc.)

One main open area (Great Rm) with Office, Work-out room & a new Primary Bedroom bathroom, covered outdoor space to BBQ year round, patios, 3 car garage. I can see using the existing house as 2 Guest Suites (for you guys & friends) with a TV-Reading Room, Offices, Work-out, Laundry

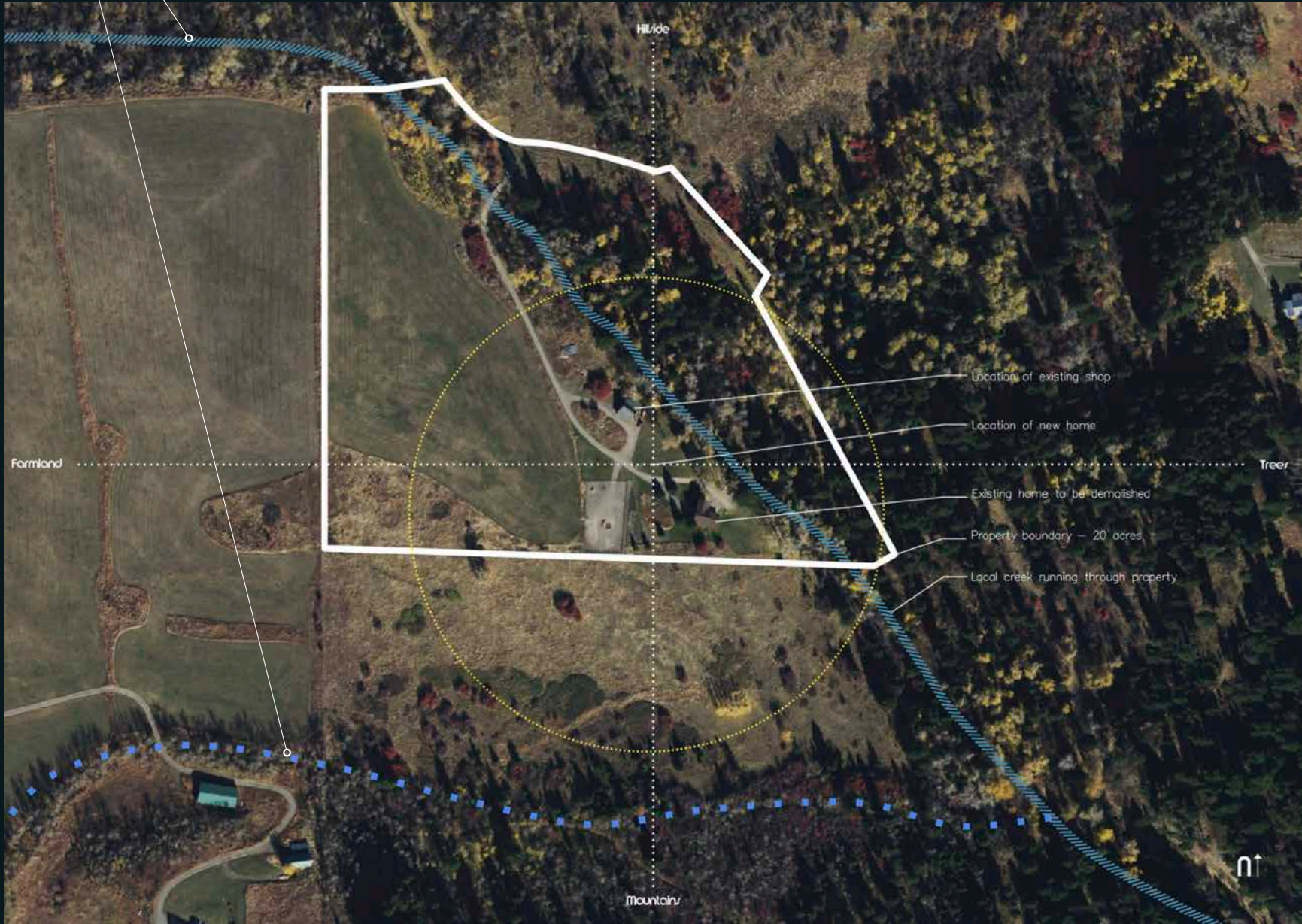
Project 1: Wilson Creek House

The contemporary site remains embedded within legal and territorial frameworks, where water is allocated, diverted, and withheld through systems that often obscure its ecological origins, human made canals are the primary example. The creek nearly runs dry every August due to longstanding water rights from ranchers

I also started noticing that a major component of my parents lives on this property (the same property I grew up with) involved the forest portion of it. There are an innumerable number of tasks: forestry, fencing, milling, cutting the wind blown trees, fixing fences...Every year. It never ends. Snow drifting, snow fence, wind blown trees found in the spring.

And what was so interesting was that I realized my parents loved this. They are out there all the time, always talking about the forest. It is inherently relational and unique to this property. Thousands of acres of national forest crash into this small wedge of property.

I also realized the main catalyst for all of this work was wind. With out it the changes would likely not be as pronounced. As it moves across the site and builds a new world every second, therein grew the project Wind as the non-human family-member for us. Snow as me and my sisters other sibling.



Questions to Mark

11th of February, 2026

MARK

Daily Rituals:

When you think of being at WC, currently, how does your day progress?

My day starts out with a normal breakfast routine and then I leave for work.

In the afternoon I return for a normal afternoon, dinner routine

Do you find that each day is similar?

Monday through Friday are as mentioned above. On the weekends, I normally do chores and activities around WC.

Unless I go XC Skiing, I go to town for errands, or off to visit friends.

What days are repetitive? Are there days that start similar, but end unexpectedly?

Currently, most days are repetitive. There are always those days the end unexpectedly due to unforeseen circumstances, but they are not very common

Do these change

with seasons?

Yes, the winters are the most varied due to snow plowing and shoveling that can be needed any day of the week.

Spring, Summer and Fall days are full of chores that are mostly done in the evenings and on weekends.

How have these rituals evolved over the decades that you have lived at Wilson Creek?

The rituals mostly changed when Chris and Ellie went off to college and their corresponding lives after that.

Now, our lives are fairly constant with semi-retirement.

How do you anticipate those needs evolving?

The biggest need changes will be due to our aging and health changes, which are undetermined at this time.

House | Daily Rituals

Does the house support these rituals or daily patterns?

Our house is too small and the layout of the rooms does not easily support our rituals or patterns

Yes - how?

The way that the house does work is that it does take advantage of our beautiful views.

No - how?

Besides what I said above, the house does not work for any kind of solar gains, or proper orientation on our property

How do you envision the addition to the house supporting these patterns?

The reconfiguration of rooms would help immensely with the current downfalls.

What type of patterns do you want to see introduced? Do you want more informal / casual hang-out space?

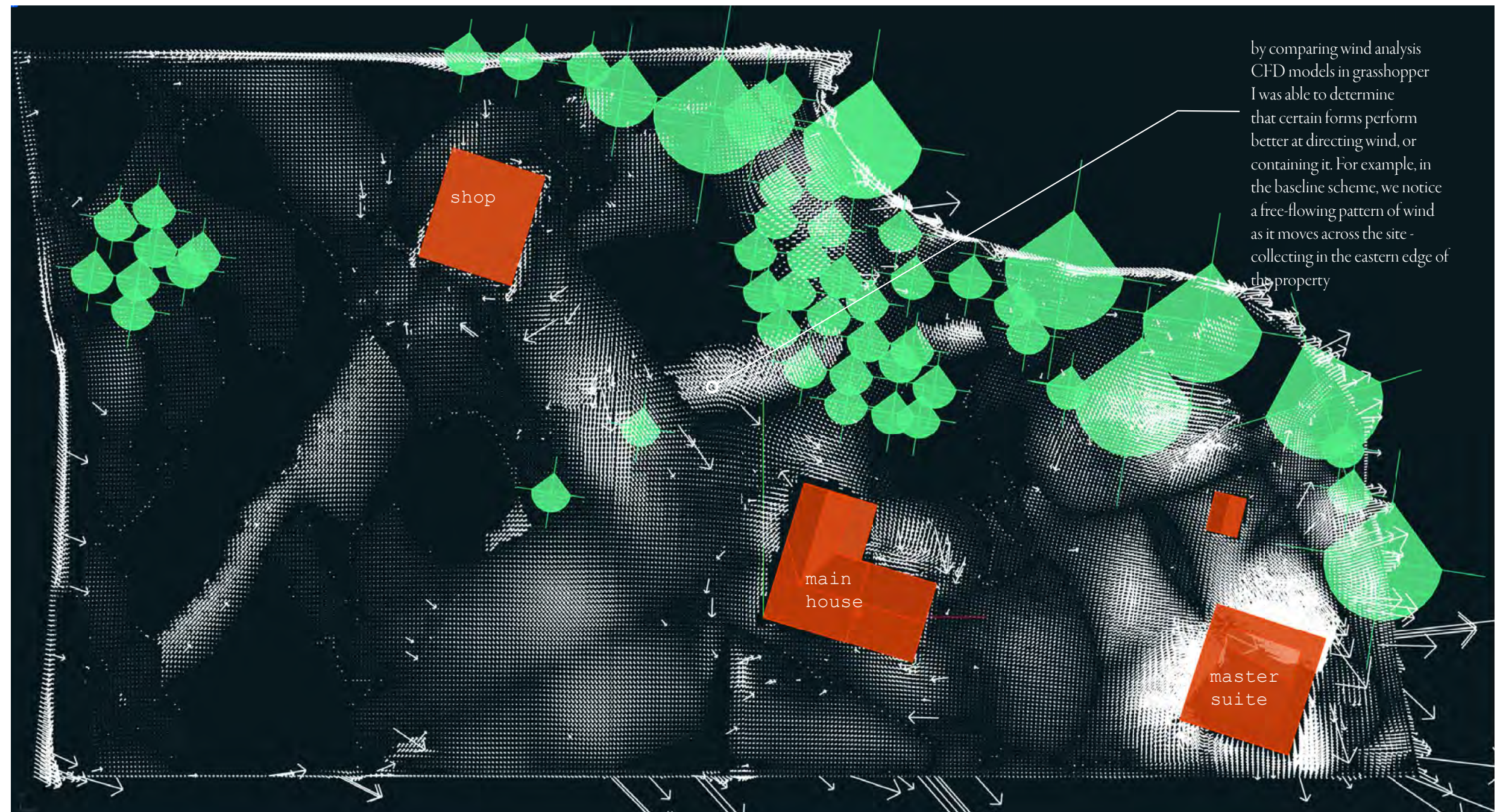
Yes, particularly a larger hang-out space by our downstairs wood stove

Or more space defined as a room? (study / library / etc.)

An office / study is very important for our current lifestyles.

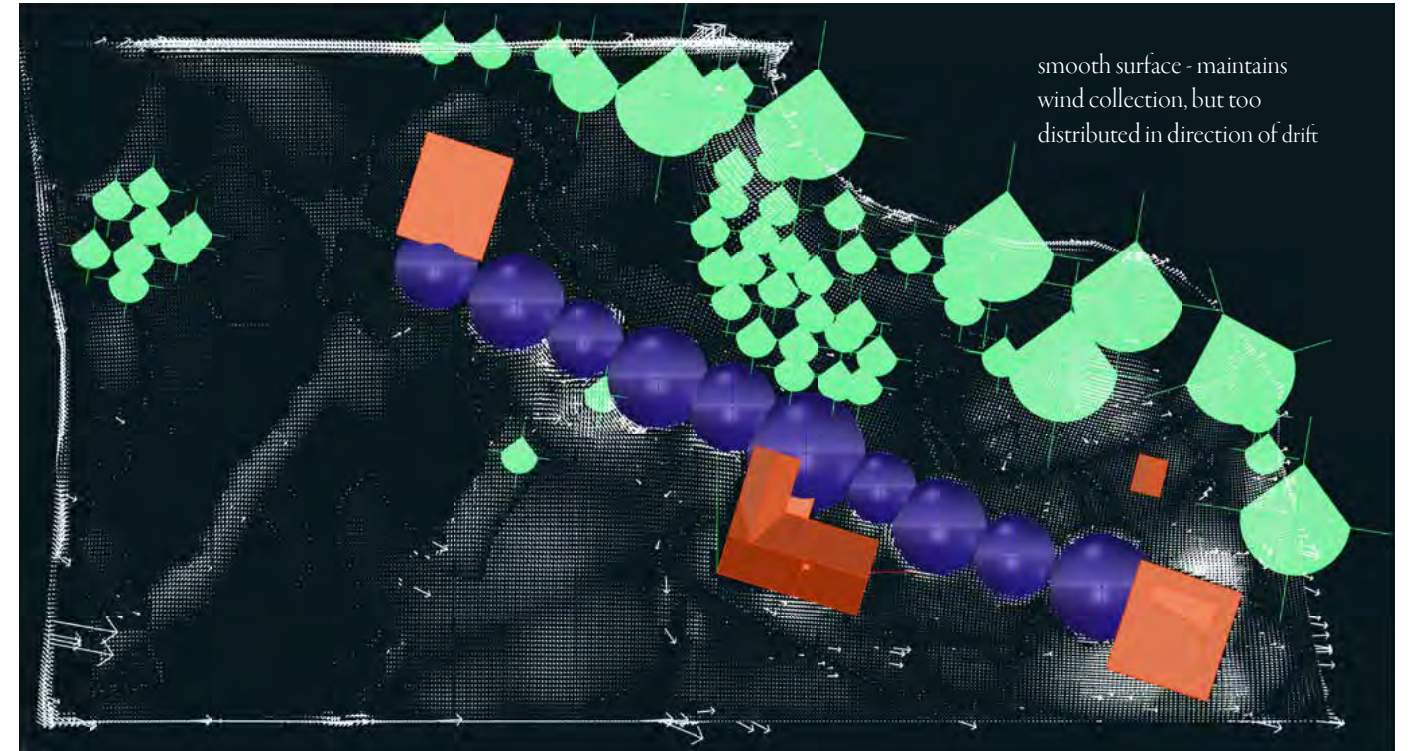
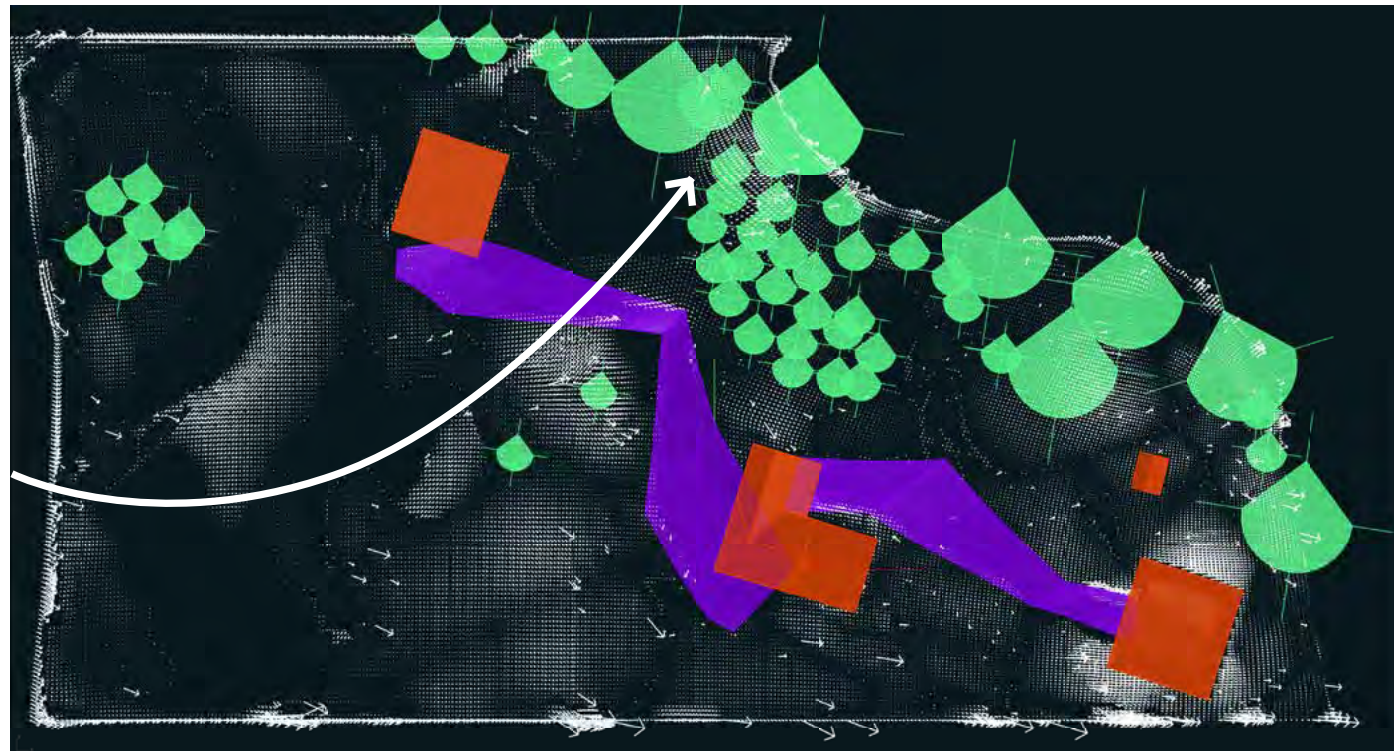
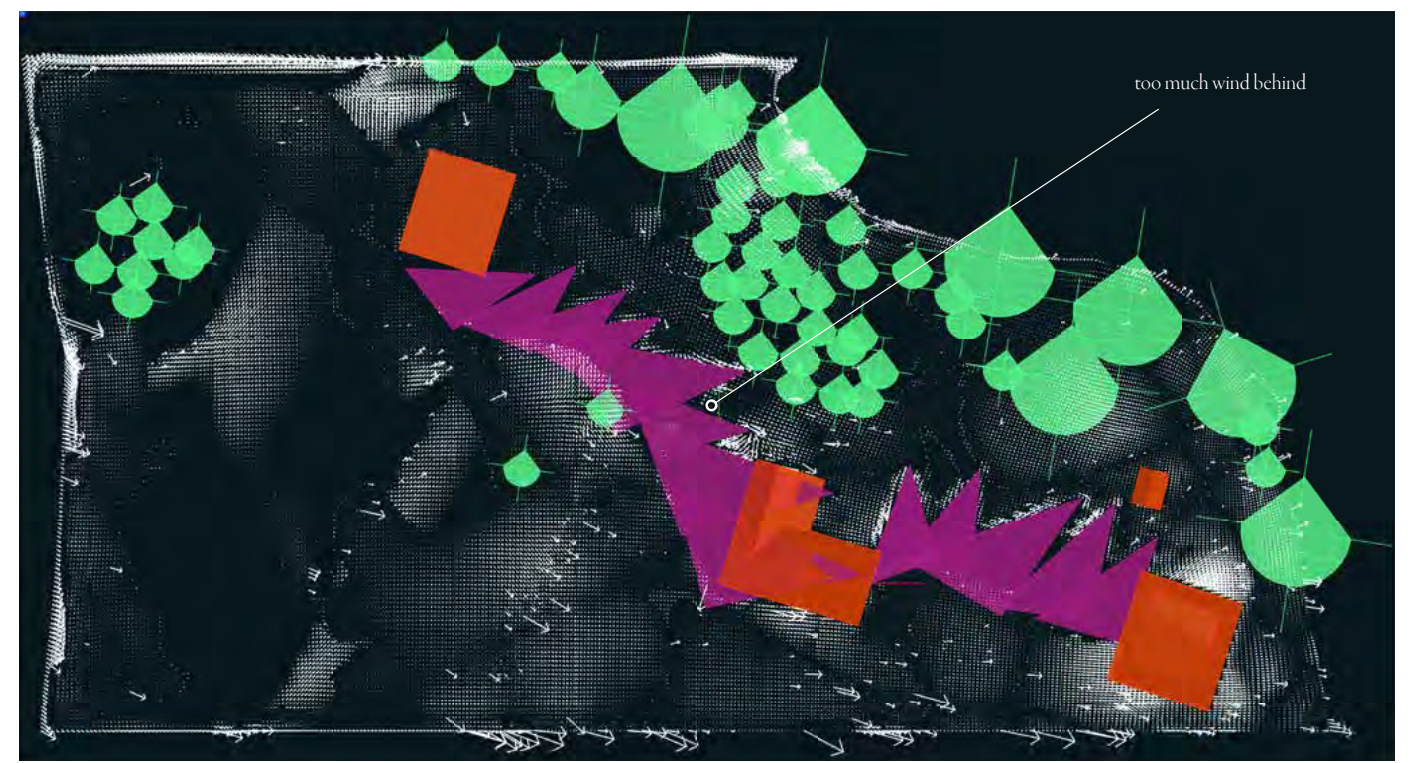
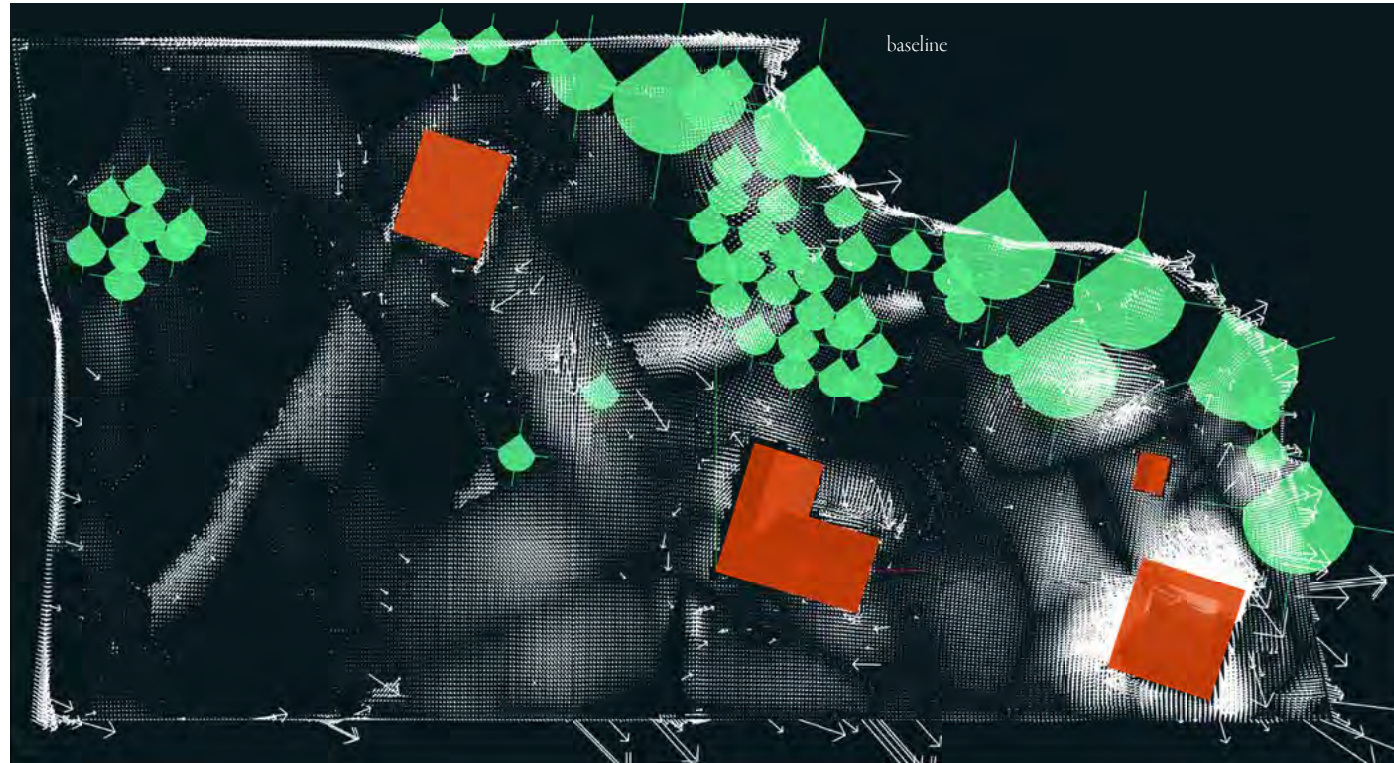
Rooms that also need more space are the kitchen / dining, laundry, and downstairs bath

Project 1: Wilson Creek House
Can you see the wind?



Top image:
ETH Zurich CFD model was built in C# and Grasshopper using Eddy3d,
Cordyceps, Claude

Project 1: Wilson Creek House
Can you see the wind?



Top images:
ETH Zurich CFD model was built in C# and Grasshopper using Eddy3d,
Cordyceps, Claude

Bottom Image:
Working prototype of scheme texted in elevation

Project 1: Wilson Creek House

“Human thought at Earth magnitude is human thinking that is as ‘large’ as the aurora. It can think the aurora in such a way that its vastness is witnessed and opened in us. A single person can do this on the ground.”

— Timothy Morton, *Dark Ecology: For a Logic of Future Coexistence*, p.24.

Morton’s concept of Earth magnitude expands the scale at which the house is understood. Solar winds interacting with Earth’s magnetic shield generate auroras through a planetary exchange of charged particles and atmospheric response. This is a non-human infrastructure already surrounding daily life: dynamic, invisible, and operative across vast scales. The Anthropocene does not replace such systems; it overlays them. Emissions alter atmospheric chemistry, warming shifts snowpack timing, and hydrological cycles are re-patterned through extraction and drought. Human action now enters processes once assumed to lie beyond consequence.

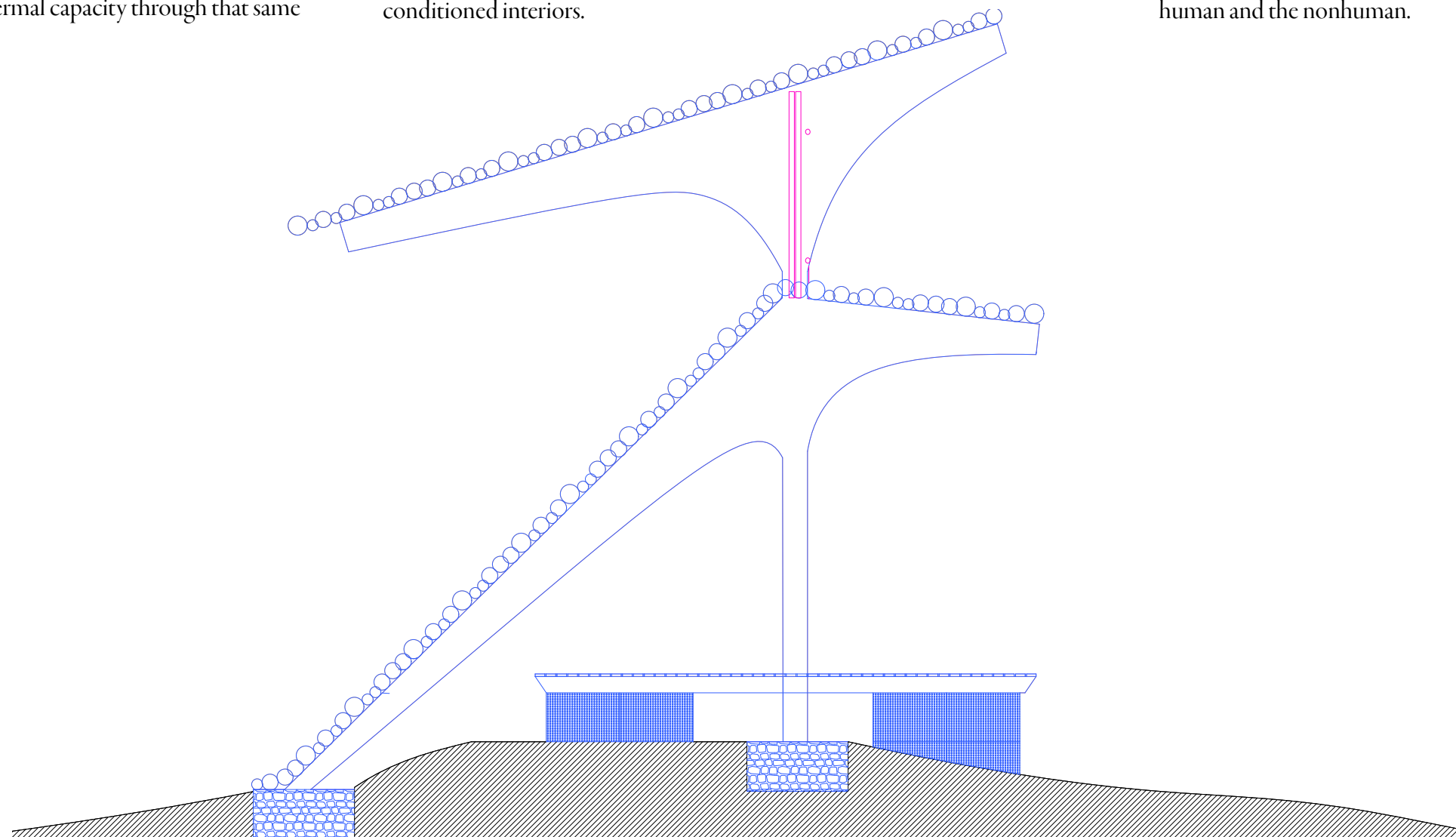
Energy, in this context, is not something simply delivered to the site from elsewhere. It is already present.

Wind moves across the valley as a continuous atmospheric force, carrying latent kinetic energy shaped by topography, pressure gradients, and seasonal change. Snow stores water and thermal capacity through that same

movement. Solar radiation, ground temperature, and runoff participate in exchanges that precede the house and will continue beyond it. Architecture chooses how to relate to these forces.

The project responds by treating environmental conditions as design inputs. Prevailing winds are mapped and redirected through roof canopies and vertical catching elements that shape snow drift as a seasonal resource. Accumulated snow becomes insulation at exposed edges, temporary enclosure at thresholds, and stored water for later release. Winter weather is not merely defended against; it participates in construction. Hydrology is equally central. Roof runoff and spring melt are slowed, filtered, and held within planted channels and cistern systems before gradual return to the creek during periods when upstream ranch withdrawals reduce seasonal flow. Domestic occupation enters an existing watershed cycle, contributing to continuity rather than only consumption.

The house is organized as a distributed cluster of volumes rather than a singular sealed object. This arrangement allows wind to move through the site, creates sheltered courtyards, preserves wildlife corridors, and supports changing seasonal patterns of use. Covered work zones, storage edges, and outdoor thresholds recognize that rural domestic life extends beyond conditioned interiors.



To think at Earth magnitude does not require distance from the ground; it requires attention to the vast systems already present there. In rural Montana, auroral atmospheres, prevailing winds, drifting snow, creek depletion, and domestic routines belong to one continuous field. The project positions architecture as an instrument that makes this field tangible—hosting human life while revealing its dependence on larger climatic and ecological relations.

“It seems clear to me then, in that strange bright water, that to say a river is alive is not an anthropomorphic claim. A river is not a human person or vice versa. Each withholds from the other in different ways. To call a river alive is not to personify a river, but instead further deepen and widen the category of life.”

Robert Macfarlane, *Is a River Alive?* p. 82.

To think at this scale, and to expand the mind, in reference to Macfarlane, is to explore the relations that are here, now. It is not anthropomorphic or human centered to do this. In fact, my argument through this entire studio is that it in fact, inverts the human perspective. It’s not a single species of its own biosphere, and consequently, this shared recognition of interdependence enhances the potential relations to exist between the human and the nonhuman.

Project 1: Wilson Creek House

WILSON CREEK RESIDENCE

Gallatin Gateway, Montana

In Southwest Montana's Gallatin Valley, this project occupies a threshold between open field and forest — an edge continuously reshaped by prevailing west-to-east winds, seasonal snow accumulation, and shifting hydrology. Rather than treating the site as a static surface to be built upon, the project reads it as an active interface where atmospheric and terrestrial systems overlap and co-produce space. The architecture enters an already dynamic condition rather than imposing order onto it.

The valley has long been a migration corridor. The Apsáalooke, Salish, Blackfeet, and Shoshone moved through this terrain seasonally, structured by ecological rhythms rather than fixed boundaries. Settler arrival replaced that mobility with property lines, fencing, and water rights — systems that continue to govern access to land and water, often obscuring the ecological origins of both. The existing

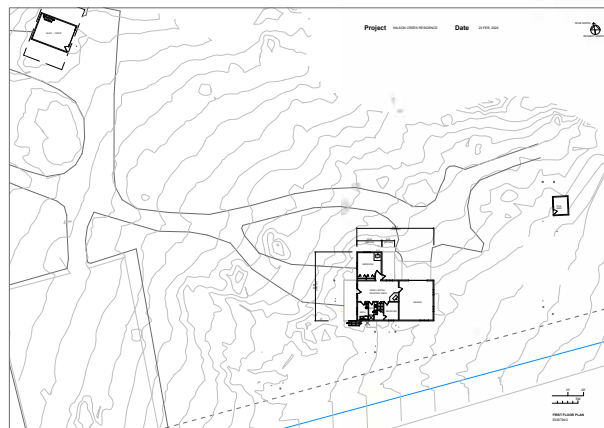
single-family house on the site sits as a singular object within this dynamic field, resisting wind, snow, and ecological movement, separating interior life from surrounding systems. That disjunction is the project's central problem.

The proposal breaks the house into distributed volumes. Fragmentation allows wind to pass through and around the architecture rather than dam against it, and the building becomes a porous field condition rather than a solid object. An upwind snow fence, calibrated at three to six fence-heights of offset, slows the prevailing wind enough that its drifting snow precipitates inside the courtyard between the two main volumes. Canopies above act as horizontal snow fences, redirecting airflow and tuning where accumulation lands. Hay bale walls — load-bearing today, compost and successional habitat tomorrow — register the same logic at the scale of material: structure as host.

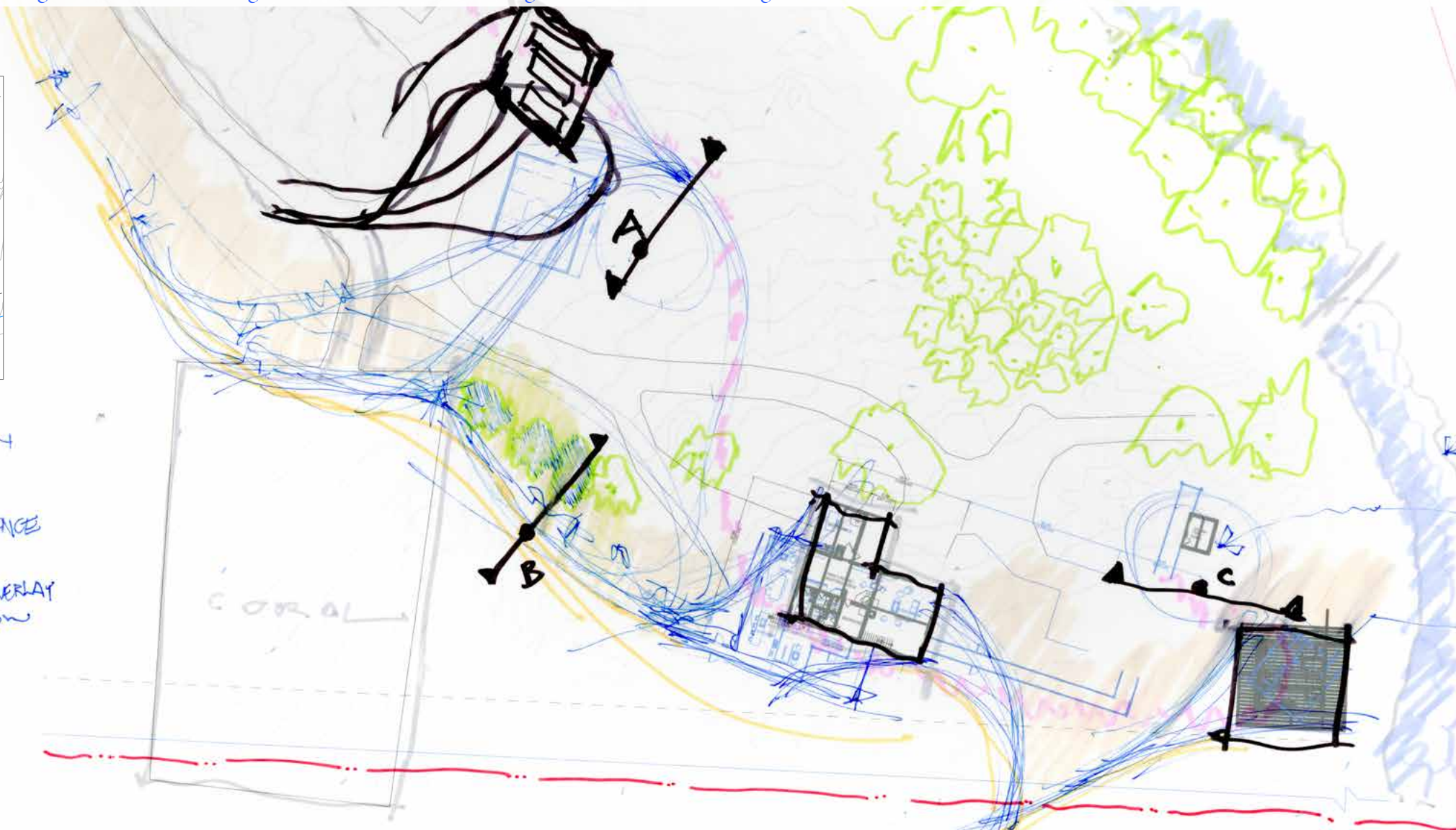
The interior courtyard then becomes the project's primary water-harvesting instrument. The drift it captures each winter melts onto a graded floor, funnels through a centered

grated inlet, and drops into a buried cistern sized to hold the full courtyard yield through spring. A controlled release valve discharges that stored water through a buried line that daylights at Wilson Creek as a slow outfall during summer's dry months. The house reverses the conventional upstream logic of valley water rights: rather than diverting from the creek, the architecture intercepts atmospheric water that would otherwise sublime or evaporate, banks it, and returns it downstream when the creek runs low.

Across spring pollinators, summer foragers, and winter fruit economies, nine documented nonhuman actors use the structure as armature — bumblebees on currant, tanagers in chokecherry, waxwings on juniper. The labor that would have gone into reassembling fence each fall instead becomes the slow work of pruning a working ecosystem. Wilson Creek Residence is offered not as enclosure but as calibration — a mediator between atmosphere, hydrology, and habitation, designed with entanglement already in place.



CIRCULATION
SNOW FENCE
DRIFT OVERLAY
OF SNOW



PRELIMINARY
SKETCH OF SITE
PLAN

Project 1: Wilson Creek House

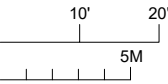
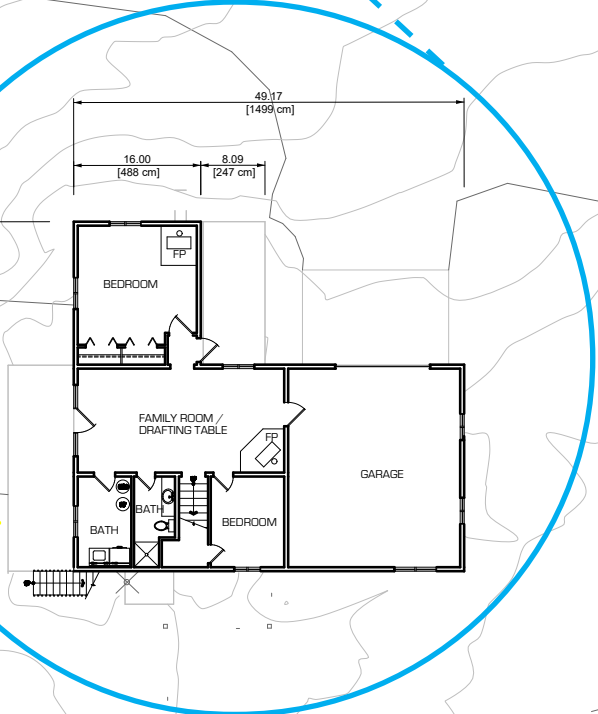
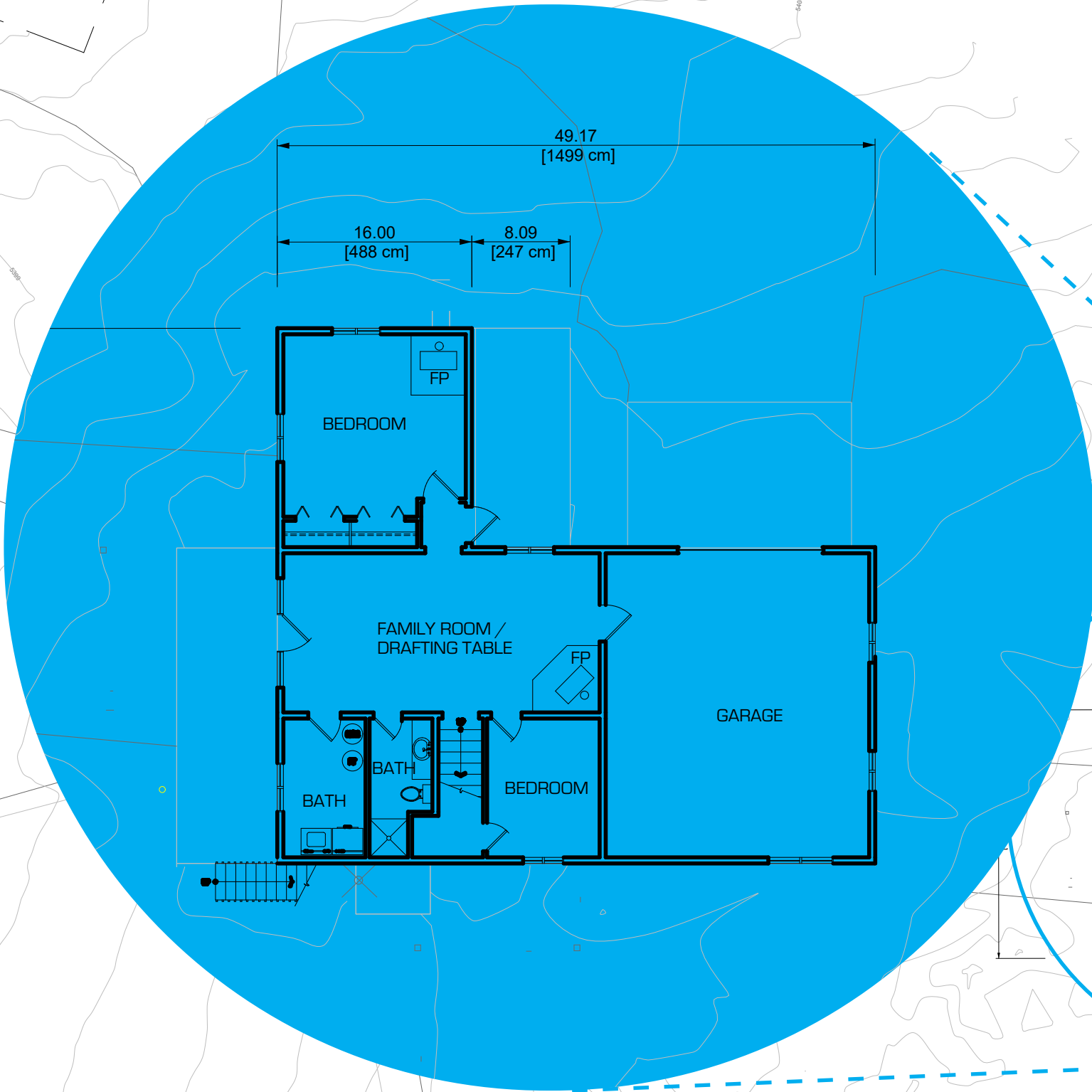
Project

WILSON CREEK RESIDENCE

existing conditions

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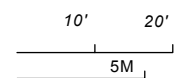
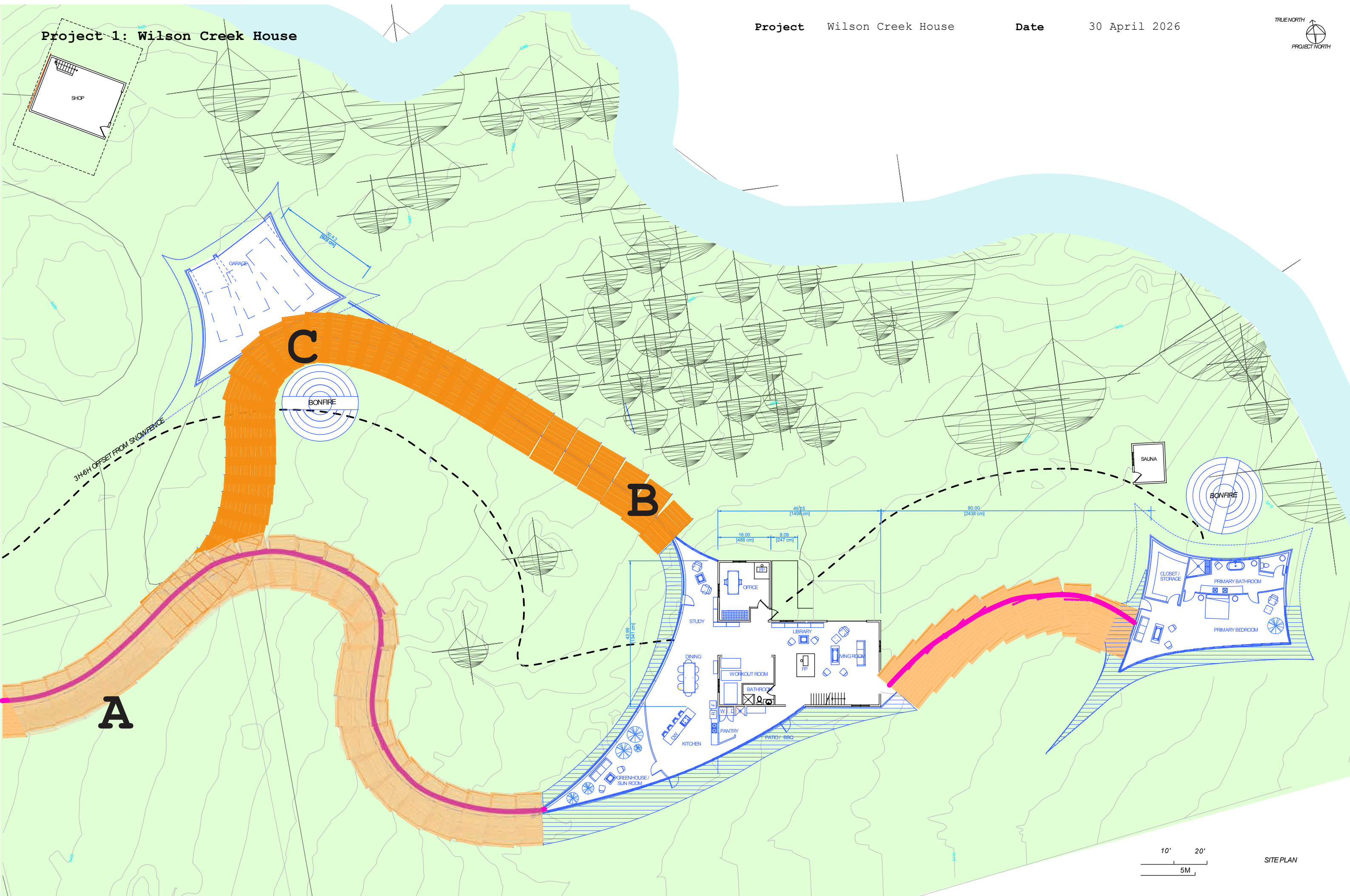
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Project 1: Wilson Creek House

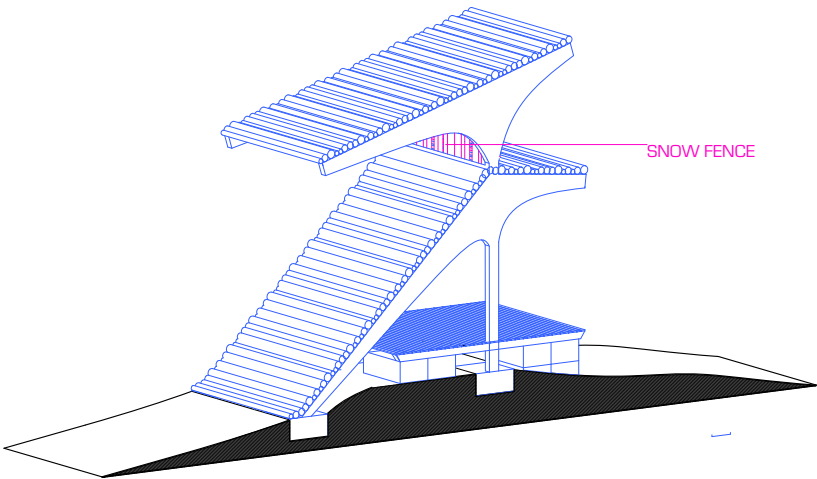
Project Wilson Creek House

Date 30 April 2026

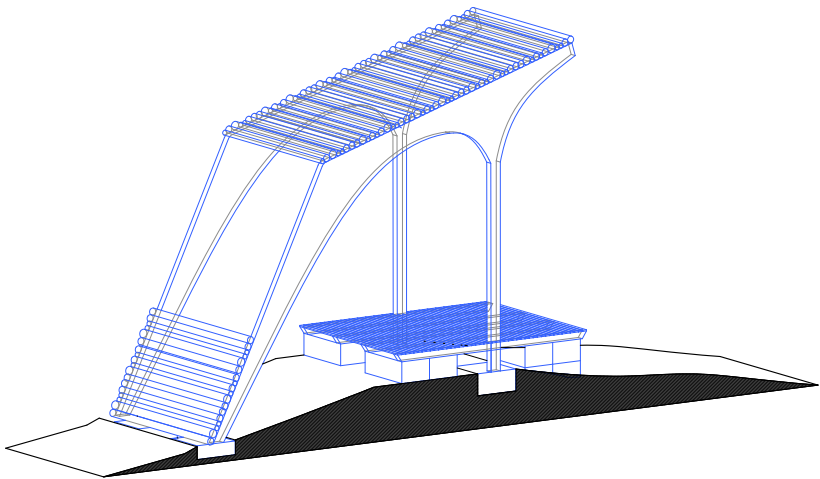


SITE PLAN

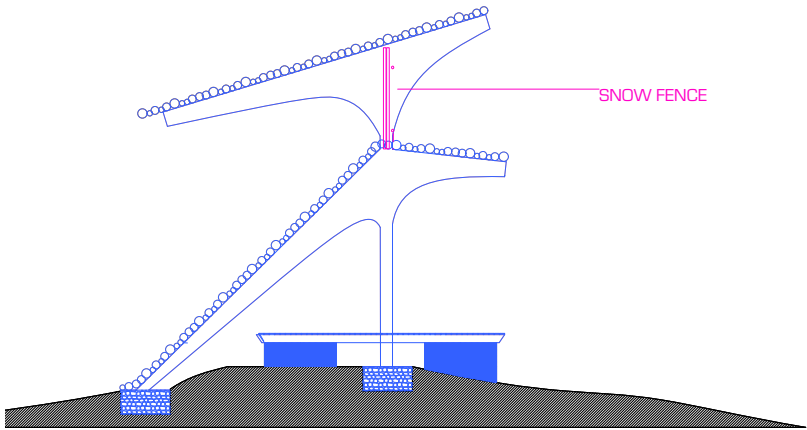
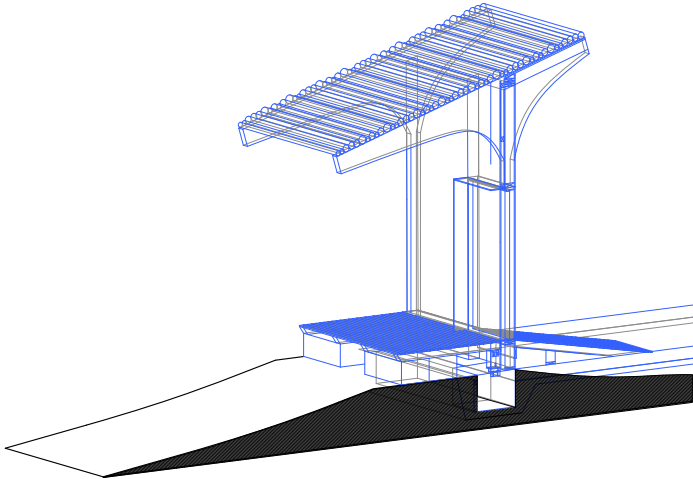
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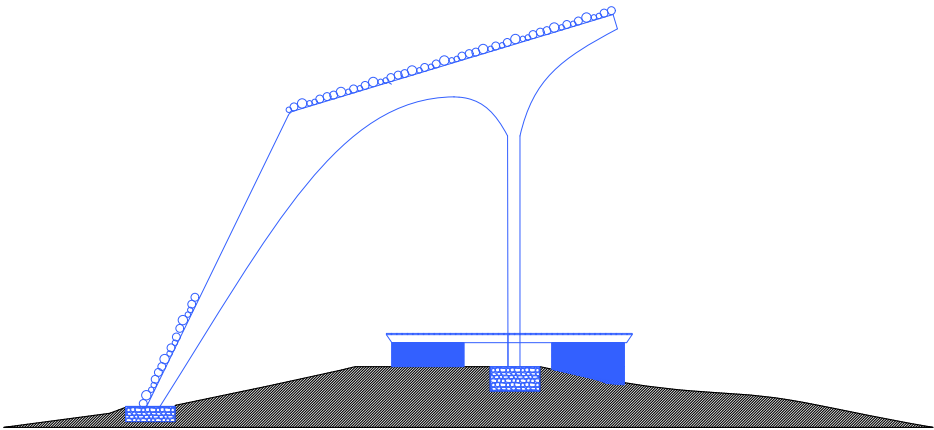
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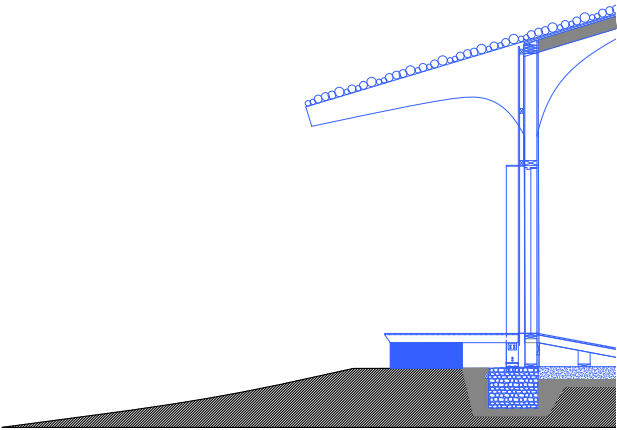
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SNOW FENCE

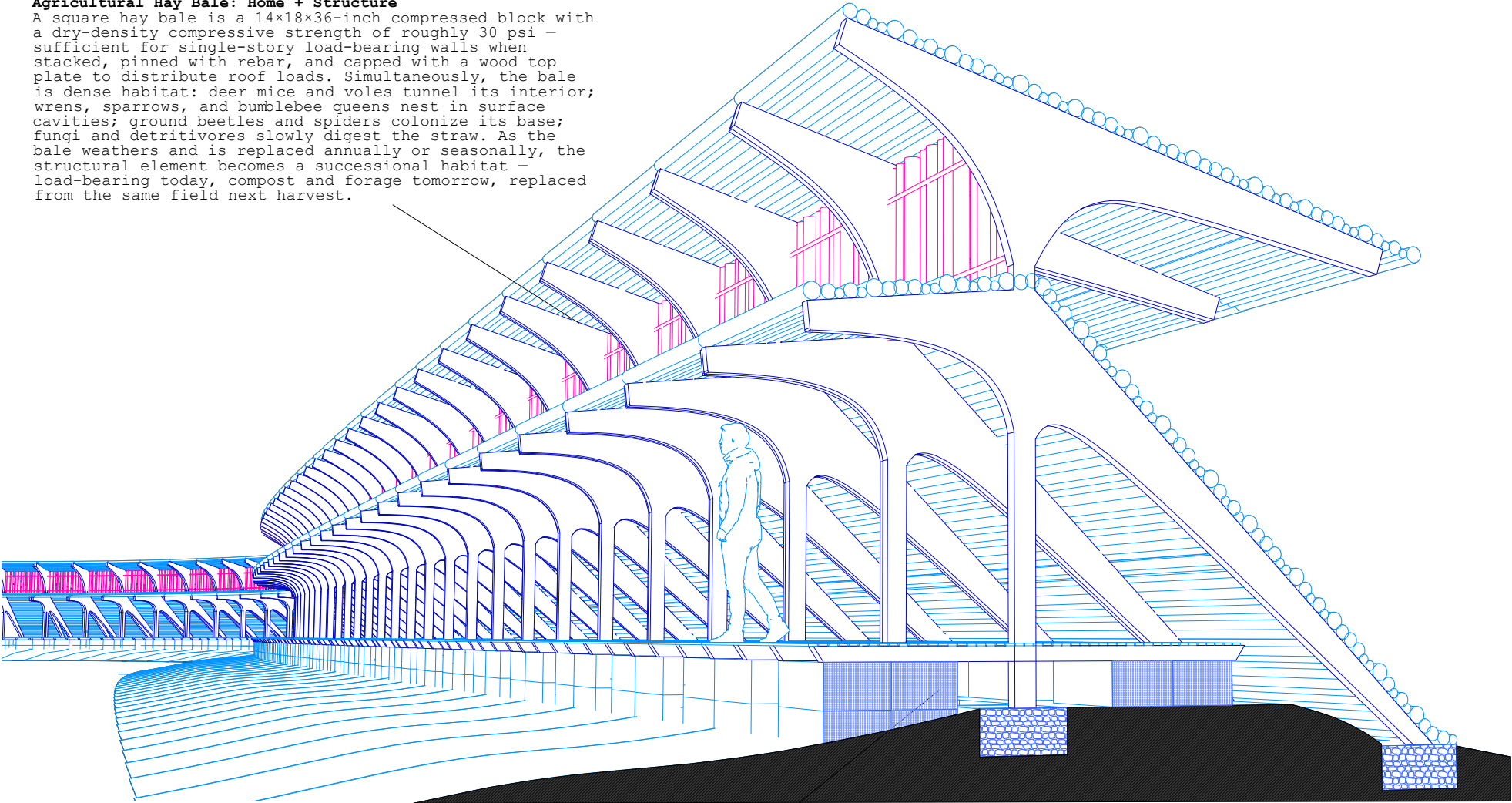


INTERIOR WALKWAY

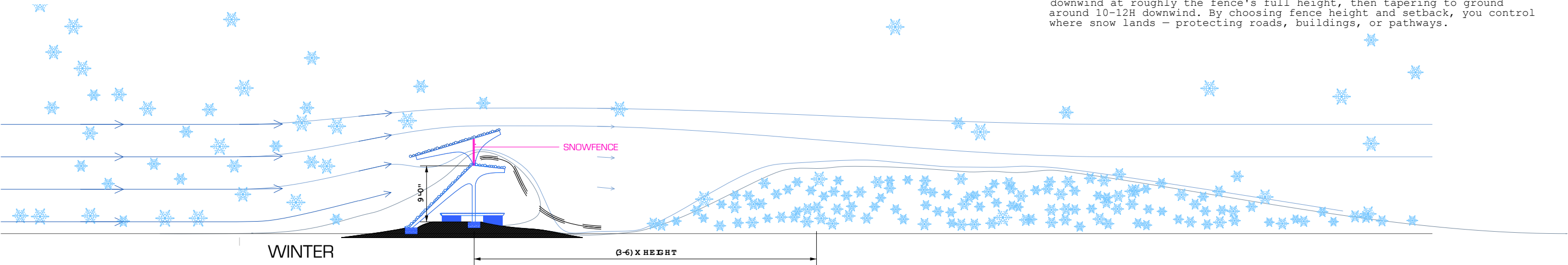


INTERIOR WALKWAY AT BUILDING

Agricultural Hay Bale: Home + Structure
A square hay bale is a 14×18×36-inch compressed block with a dry-density compressive strength of roughly 30 psi – sufficient for single-story load-bearing walls when stacked, pinned with rebar, and capped with a wood top plate to distribute roof loads. Simultaneously, the bale is dense habitat: deer mice and voles tunnel its interior; wrens, sparrows, and bumblebee queens nest in surface cavities; ground beetles and spiders colonize its base; fungi and detritivores slowly digest the straw. As the bale weathers and is replaced annually or seasonally, the structural element becomes a successional habitat – load-bearing today, compost and forage tomorrow, replaced from the same field next harvest.



The MT House’s snowfence treats its envelope as habitat infrastructure rather than enclosure. Hay bale walls – load-bearing in the building’s first life – host an active community of burrowing nonhumans from day one: deer mice and meadow voles tunneling between bales, jumping mice and shrews working the warm interstices, ground beetles and native solitary bees (mason and leafcutter species) colonizing the dry straw cavities. As the bales compost over five-to-seven year cycles, they’re rotated out into the field as soil amendment, the structural frame re-packed with fresh hay, and the burrow community simply re-establishes – a successional architecture rather than a static one. The upwind snow fence, calibrated at three to six fence-heights of offset, precipitates drift inside the courtyard, where meltwater funnels to a buried cistern and discharges to Wilson Creek in summer. Across spring pollinators, summer foragers, and winter fruit economies, nine documented nonhuman actors – bumblebees on currant, tanagers in chokecherry, waxwings on juniper – use the structure as armature.



Project 1: Wilson Creek House

Nonhuman Interdependence at Wilson Creek

The nonhuman interdependence provides the framework. Once the structure is built – local milled logs, stone foundations, replaceable members – it stops being only infrastructure for my parents and becomes a year-round host for the nine nonhuman actors documented across ten native Montana plants on this site. The interdependences cluster into three coupled cycles.

Spring belongs to the pollinators: blue orchard bees emerge with golden currant and chokecherry bloom, while western bumblebee queens depend heavily on currant nectar to found new colonies. Plant these along the walkway's sun-exposed edge and your parents walk through pollination in progress. Summer is the long nectar season. Wild bergamot is the iconic plant for bumblebees and hummingbird moths at dusk; honeybees produce aromatic monofloral bergamot honey here.

Western tanagers glean caterpillars from chokecherry foliage to feed nestlings, and lazuli buntings nest within Woods' rose thickets – the thorns ideal cover, the hips eaten in fall. The walkway becomes a transect through active foraging. Autumn and winter are the fruit economy. Rabbitbrush carries late-fall nectar for bumblebees before dormancy. Cedar waxwings strip ripe chokecherries in days, then move to silver buffaloberry and Rocky Mountain juniper as winter deepens. Bohemian waxwings arrive for the frozen fruit your robins missed; juniper berries become a critical winter staple. The labor your parents would have spent assembling fence each fall instead becomes the slow work of nine species using the structure as armature. Replacing a weathered log is no longer a chore – it's pruning a working ecosystem.

How a Snow Fence Works

A snow fence operates on a deceptively simple principle: it doesn't block snow – it slows the wind. Drifting snow is carried as a near-ground bedload of saltating particles, and the carrying capacity of moving air scales with roughly the cube of wind velocity. Cut the wind speed in half, and the air can carry only about an eighth of the snow it did before. Whatever it can no longer carry must drop.

The fence achieves this through controlled porosity, typically around 50%. As wind approaches, it begins to compress and lift several fence-heights (H) upwind, since the porous barrier is sensed by the flow before contact. Air passing through the slats is throttled and turbulent; air going over separates and forms a sheltered wake on the leeward side. In this wake, velocity drops sharply – to roughly 30-40% of the upwind speed – and the snow precipitates out of suspension.

The result is a characteristic asymmetric drift: a small upwind deposit about 1H upstream, and a much larger leeward drift peaking near 3-6H downwind at roughly the fence's full height, then tapering to ground around 10-12H downwind. By choosing fence height and setback, you control where snow lands – protecting roads, buildings, or pathways.

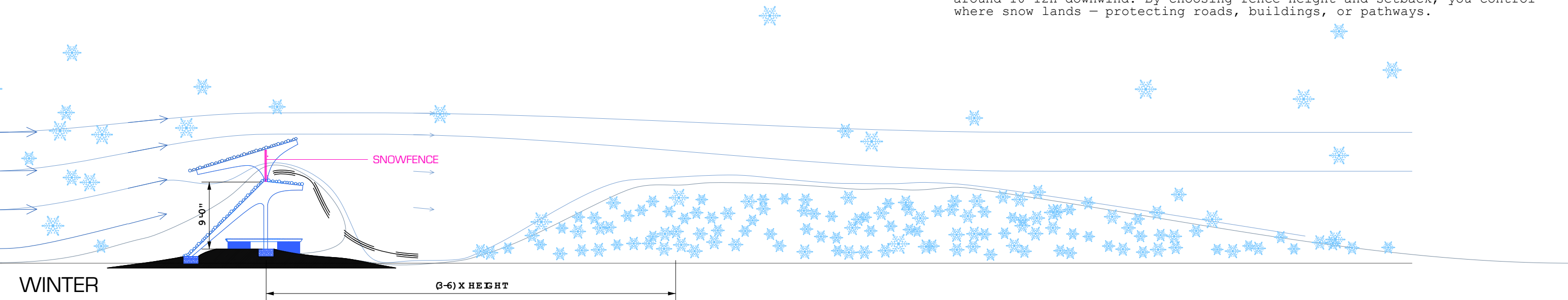
Project 1: Wilson Creek House

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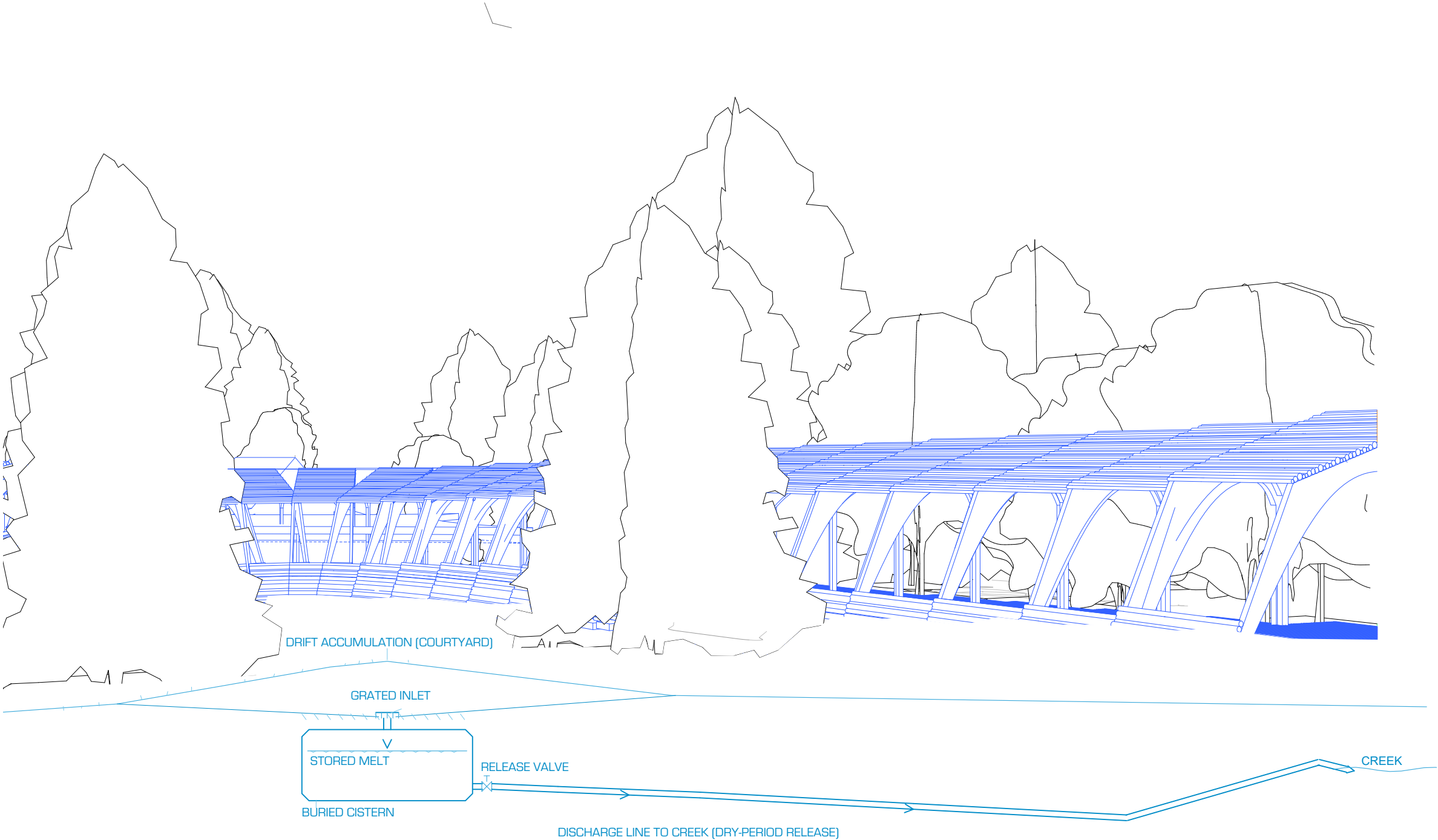
Project 1: Wilson Creek House

CISTERN COLLECTION

The interior courtyard between the two distributed volumes operates as the project's primary water-harvesting instrument. Prevailing west-to-east winds, slowed by the upwind snow fence and channeled between the building masses, deposit a deep asymmetric drift across the courtyard floor – the same atmospheric behavior that elsewhere shelters the walkway here becomes the site's seasonal water store.

As temperatures rise, the drift melts onto a graded courtyard floor that funnels meltwater toward a centered grated inlet. From there, a drop pipe carries water into a buried cistern sized to capture the full courtyard yield. The cistern holds water through the spring runoff window and into the dry months that follow.

A controlled release valve regulates discharge through a buried line that runs east beneath the eastern volume, daylighting at Wilson Creek as a slow outfall. The system reverses the conventional logic of upstream allocation: rather than diverting water from the creek, the architecture intercepts atmospheric water that would otherwise sublimate or evaporate, banks it, and returns it downstream when the creek runs low. The house becomes a hydrological participant – collecting in winter, holding through spring, releasing in summer.



Agricultural Hay Bale: Home + Structure
A square hay bale is a 14×18×36-inch compressed block with a dry-density compressive strength of roughly 30 psi – sufficient for single-story load-bearing walls when stacked, pinned with rebar, and capped with a wood top plate to distribute roof loads. Simultaneously, the bale is dense habitat: deer mice and voles tunnel its interior; wrens, sparrows, and bumblebee queens nest in surface cavities; ground beetles and spiders colonize its base; fungi and detritivores slowly digest the straw. As the bale weathers and is replaced annually or seasonally, the structural element becomes a successional habitat – load-bearing today, compost and forage tomorrow, replaced from the same field next harvest.

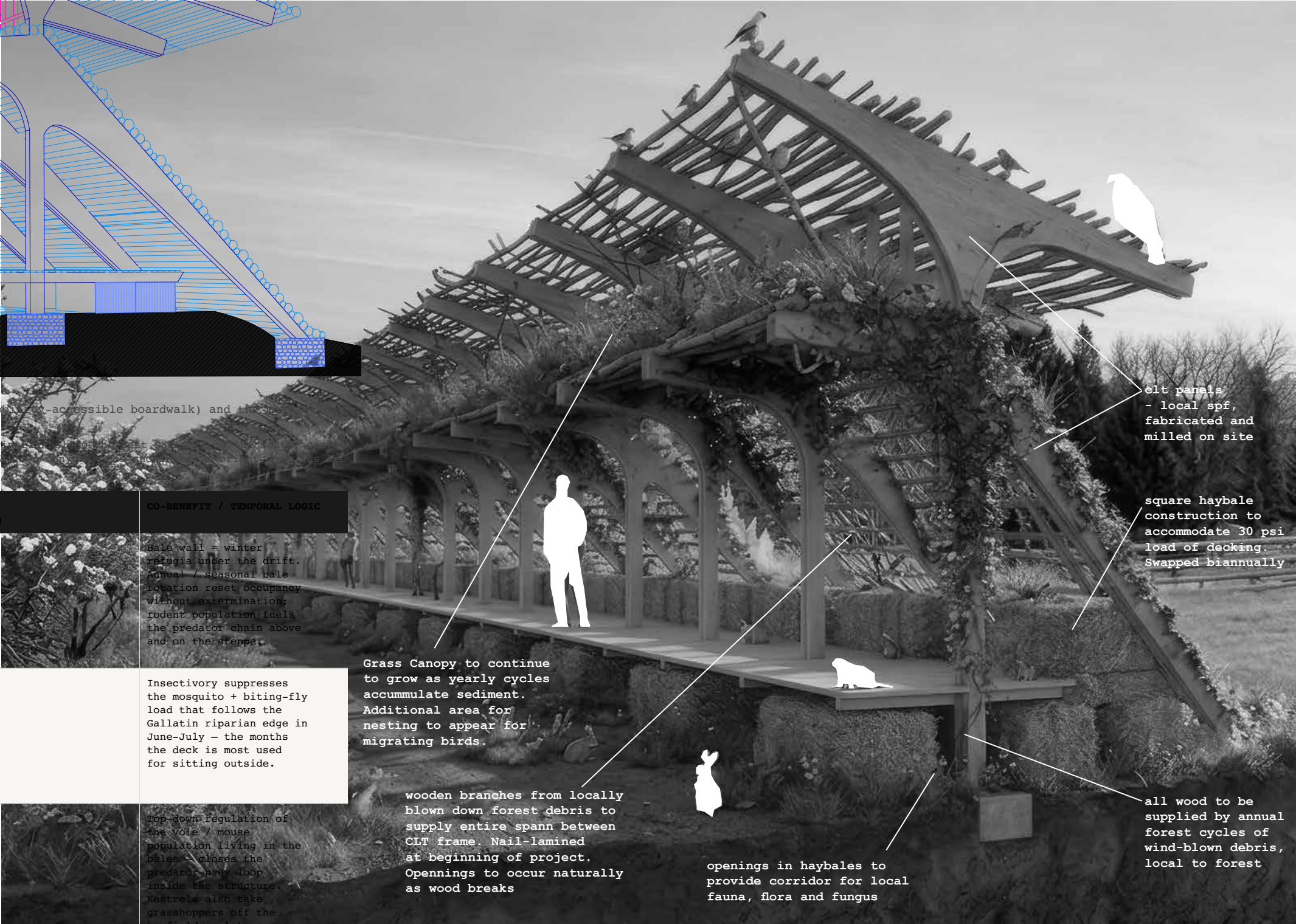
Project 1: Wilson Creek House

MT HOUSE – AGRICULTURAL SNOWFENCE :: GALLATIN GATEWAY, MT

Species Interaction Matrix : structure as cohabited threshold between human use (mostly non-accessible boardwalk) and the snowdrift at the mouth of Gallatin Canyon

Site context : ~4,700 ft, hayfield + sagebrush-Idaho fescue matrix; cottonwood + willow riparian forest; west-facing slope; migration corridor pinching out of the Gallatin Range. Prevailing winter wind is W-SW which is also the warmest summer face.

NON-HUMAN AGENT (Gallatin Gateway)	NICHE IN ASSEMBLY	HUMAN INTERACTION (boardwalk + parents' mobility)	CO-BENEFIT / TEMPORAL LOGIC
Montane vole + deer mouse (Microtus montanus, Peromyscus maniculatus)	Tunnel the interior of stacked alfalfa / grass-hay bales below the boardwalk plinth; surface runways through the Idaho fescue at the bale foot.	Heard, not seen. The flush, level boardwalk (deck ~36" clear, no thresholds) passes directly over active burrow systems – vertical separation lets a walker / rollator user move the full length without disturbance, and without disturbing them.	Bale wall = winter refugia under the drift. Annual / seasonal bale rotation reset occupancy without extermination; rodent population fuels the predator chain above and on the steppe.
Black-billed magpie + mountain chickadee + house wren (year-round and summer residents)	Magpies cache and patrol the diagrid ridge; chickadees and wrens nest in surface cavities of the weathered bales and in protruding stick-ends of the roof lattice.	Audible canopy. The covered boardwalk reads as a long aviary – magpie chatter and chickadee call become the primary wayfinding cue for a low-vision parent moving east-to-west along the deck. The sound itself locates you.	Insectivory suppresses the mosquito + biting-fly load that follows the Gallatin riparian edge in June-July – the months the deck is most used for sitting outside.
American kestrel + northern harrier (+ occasional rough-legged hawk in winter)	Top of the diagrid ridge and the cantilevered eaves – the highest stable perch between the hayfield and the canyon mouth, with clear sightlines down both the drift shadow and the fescue strip.	A landscape event, legible from the boardwalk looking up through the diagrid. Ramped (not stepped) approach to the deck means a parent using a cane can stop, lean, look up, and resume without a level change or handrail break.	Top-down regulation of the vole / mouse population living in the bales – closes the predator-prey loop inside the structure. Kestrels also take grasshoppers off the hayfield in late summer.
Native bumblebees (Bombus huntii, B. bifarius) + mason bees + late-summer monarchs	Queen bumblebees over-winter in surface cavities of the bale wall. Forage on the lupine / blanketflower / bergamot strip at the bale foot and on native clematis (Clematis ligusticifolia) on the windward elevation.	The vine-clad windward face puts pollinators at boardwalk-rail height – close enough to watch from a bench, separated by the rail line so a parent who can't step back quickly is still safe. Scent of bergamot doubles as a location cue at the southeast bay.	Pollination of the perennial matrix that stabilizes the cut bank and anchors the snowdrift downwind. Native clematis on the windward face shades the deck in late afternoon – same plant doing both jobs.



clt panels
- local spf,
fabricated and
milled on site

square haybale
construction to
accommodate 30 psi
load of decking.
Swapped biannually

Grass Canopy to continue
to grow as yearly cycles
accumulate sediment.
Additional area for
nesting to appear for
migrating birds.

wooden branches from locally
blown down forest debris to
supply entire spann between
CLT frame. Nail-laminated
at beginning of project.
Opennings to occur naturally
as wood breaks

openings in haybales to
provide corridor for local
fauna, flora and fungus

all wood to be
supplied by annual
forest cycles of
wind-blown debris,
local to forest



Five moments emerge along the path.
Each corresponds to one life lost.
Each corresponds to one color named by the community.
Soft pink.
Blue.
Yellow.
Purple.
Green.

These are not monuments, but experiences held at the level of the body.
At each moment, the gabion benches and steps drop slightly to follow the topography of the site – low, porous accumulations of locally gathered stone.
They do not rise above you.
They do not enclose.
Each zone is planted with its corresponding bloom color.
You encounter them one by one.
Never all at once.
Together, they form a constellation across the site.
Across space, time and memory. The liminal zone between life and death and the human and nonhuman.
By processing what this memorial is – by forming a memory of it –
a new understanding is born.

The Five Colors

The use of colors was established through participatory workshops (via KU Leuven's research with local youth) to represent the personalities and legacies of the five victims murdered on February 11, 1990. These colors are frequently used in the site's murals, paper flowers for commemorations, and educational art projects.

The specific associations for each victim are:

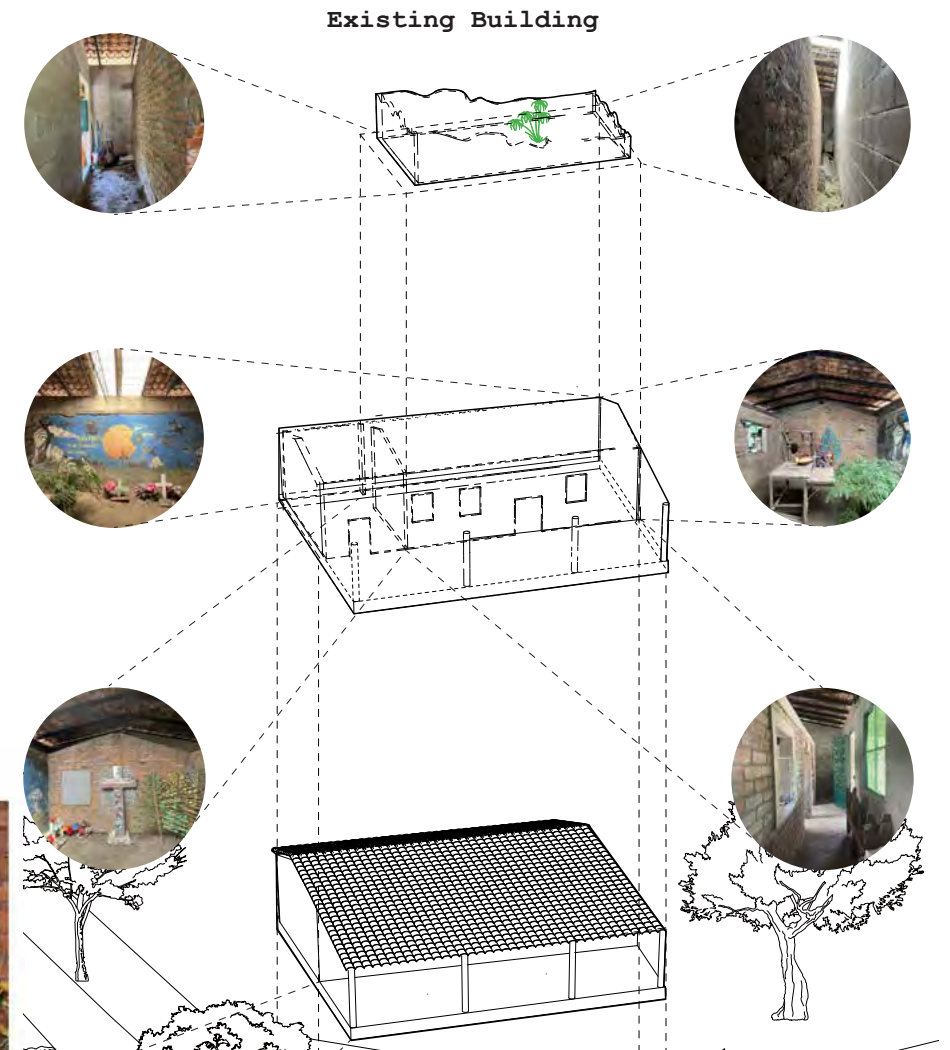
Soft Pink: represents Blanca, the youngest victim at only two years old; it symbolizes her innocence.
Blue: represents Aníbal, the only adult killed; it symbolizes tranquility (he was found in a position that suggested he was trying to protect his daughter during the bombing)
Yellow: represents Isabel, chosen because her mother remembers her as a very joyful girl.
Purple: represents Beatriz, chosen to symbolize strength, specifically focused on the strength of women.
Green: represents Dolores (the boy); it symbolizes hope and curiosity, reflecting his strong desire to study and keep learning.



Flora Analysis

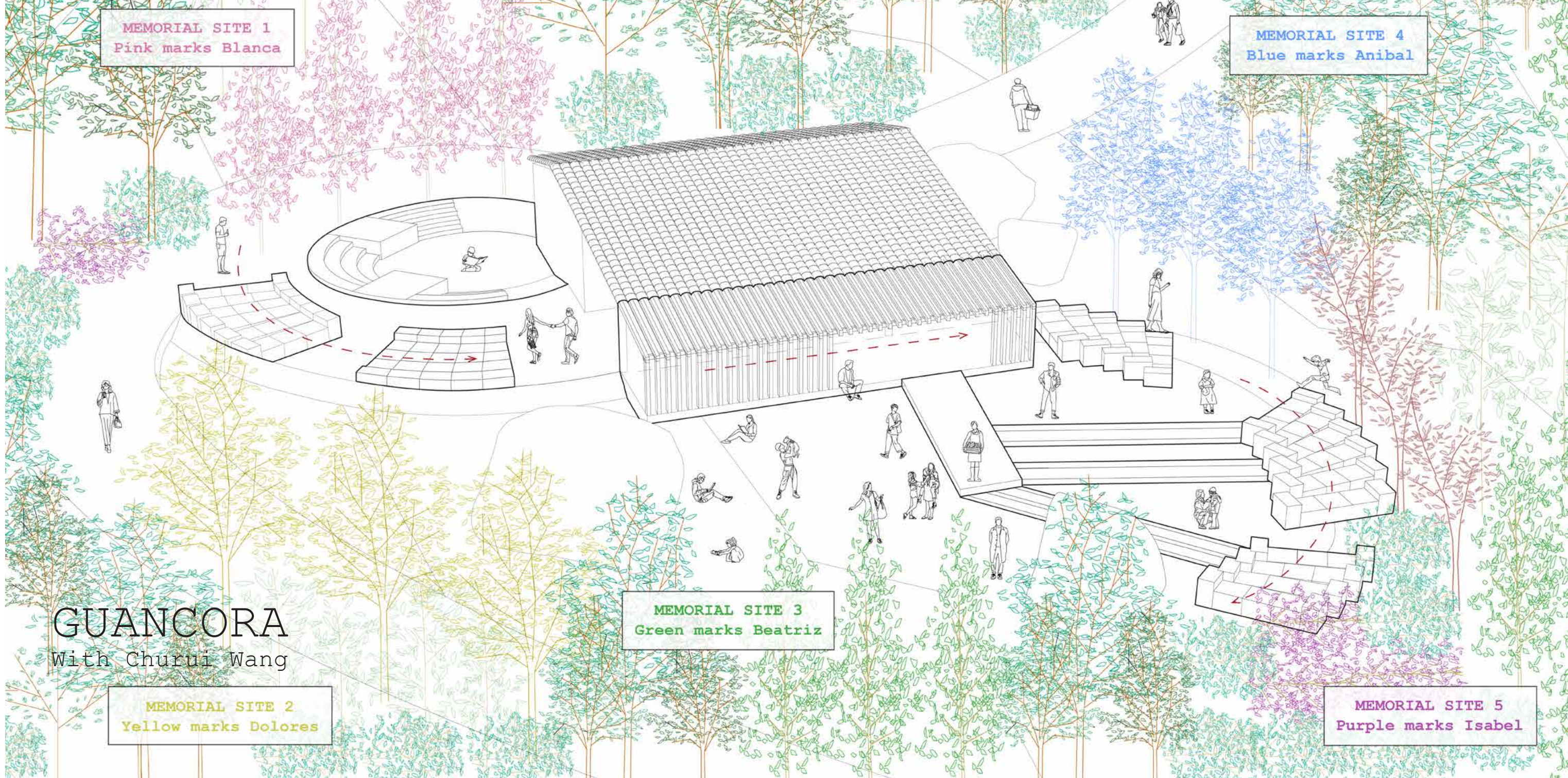


Project 2: Guancora



Within the ruins, a plant grows.

Unidentified.
Unplanted.
Unwatered.
It persists.
The project begins here – with coexistence.
The site is already working:
soil holding moisture,
seeds arriving by wind,
roots moving through stone.
The intervention organizes what is already happening.
A path extends from the church to the ruin – following the movement the community has made for decades.
But along this path, the ground begins to thicken.



TOISON d'OR

With Kai Park, Mi Zhou

Brussels is undergoing a behavioral transformation. Vacancy is rising while employment remains stable – work itself is decoupling from its fixed typologies. The post-pandemic city has already moved on; its buildings have not caught up. To understand Toison d'Or, we have to look further back. Brussels grew up behind a fortified wall – the second enclosure, built in the fourteenth century. Under Napoleon, that wall was dismantled and replaced by the ringway, the Petite Ceinture, whose boulevards still trace its outline. Boulevard de Waterloo is one of those boulevards. It is, quite literally, the line of the former wall. And Toison d'Or sits just outside it. The separation is still active. Brussels' 2030 and 2050 planning visions place new development almost entirely within the Pentagon or along the canal – the Ixelles plateau remains consistently on the edge of those diagrams. The site inherits a peripheral condition that began with the wall and has never resolved.

Our project takes that inheritance as a starting point. Toison d'Or sits directly across Boulevard de Waterloo from Parc d'Egmont, on the periphery of a green network extending through the Bois de la Cambre and the Forêt de Soignes. The site is already entangled – with park, street, commuter, resident, and the migratory species moving through the corridor. What the planning maps treat as edge, the ecology treats as continuous. The interior of the building becomes the hinge. Three interventions operate simultaneously across the section, each working at a different scale of time, body, and ecology.

The Atrium as Cohabitation

Toison d'Or is a mid-century concrete tower that has spent its entire life turned inward – a sealed corporate floorplate, an inner core of services, windows that open onto nothing. Yet migratory birds – blackcaps and redstarts in summer, fieldfares in winter – already move along the corridor outside. The plants that support them grow in the gardens nearby. The building acknowledges none of it. My intervention is about making the tower admit where it is.

The move is surgical. The inner core is not cut away but re-adapted. As the floorplate contracts, the mechanical zone shrinks to roughly a third of its original footprint, supplemented by natural ventilation drawn through the atrium itself. Shafts that are no longer needed are selectively removed, and the atrium takes its form from careful navigation around the existing beams and columns that remain. The new infrastructure does not come at the expense of the old; it threads through it. The atrium becomes the place of cohabitation. Not a lobby. Not an amenity. A shared interior ecology, planted floor by floor with the same palette that supports the city's pollinators and passerines – butterfly bush and lavender for summer, elder and dogwood for autumn migration, holly and rugosa rose carrying berries into the winter. Bee hotels are built into the atrium walls. The ringing terraces are hybrid zones where a resident working from home shares the threshold with a red admiral or a blackcap passing through.

This couples directly to Kai's café below and Mi's rooftop above. Spent coffee grounds from the café compost back into the terrace soil beds, feeding the rooftop canopy at the top. What the cyclists drink becomes what the pollinators feed on. Boulevard de Waterloo, café, atrium, terrace, rooftop: one continuous gradient from public mobility to private dwelling, threaded by nonhuman actors already using the site.

Drawing on Tsing, Morton, and Kallipoliti, the proposal treats the concrete frame as something to be inhabited with rather than against.

Project 3: Toison d'Or

the atrium becomes the place of co-habitation

terraces are semi private and allow for a hybrid zone of work and engagement with nonhuman actors on site

inner core is cut away; beams and columns remain

atrium walkway becomes a blend of private, public, and semi public space

living unit

working unit

Toison d'Or
Plan +6 - PROPOSED

Toison d'Or
Plan +6 - EXISTING

TOISON d'OR

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Drawing on Tsing, Morton, and Kallipoliti, the proposal treats the concrete frame as something to be inhabited with rather than against.

TOISON D'OR

Chris Smith
Kai Park
Mi Zhou

Columbia GSAPP
ADV VI Studio
Spring 2026

The Toison d'Or project (Columbia GSAPP, ADV VI Studio, Spring 2026) reimagines a sealed mid-century Brussels tower as a porous, multi-species building. Sited just outside the city's historic second enclosure and across from Parc d'Egmont, it leverages an ecological corridor extending to the Forêt de Soignes.

Three coordinated interventions operate across the section. The nonhuman atrium carves out the sealed core into a vertical cohabitation space planted for pollinators and migratory birds, threading work units below into living units above. The bicycle cafe repurposes extracted facade windows as a ground-level civic

hinge—responding to Belgium's 2023 cycling commuter law—combining parking, showers, and a planted ramp. The hybrid upper floors dissolve boundaries between co-working, short-stay, and long-term housing, with a rooftop canopy completing the building-wide ecological system.

Drawing on Tsing, Morton, and Kallipolitis, the project adds porosity rather than program-inhabiting the concrete frame with rather than against.

HYBRID TOWER

BIKE CAFE

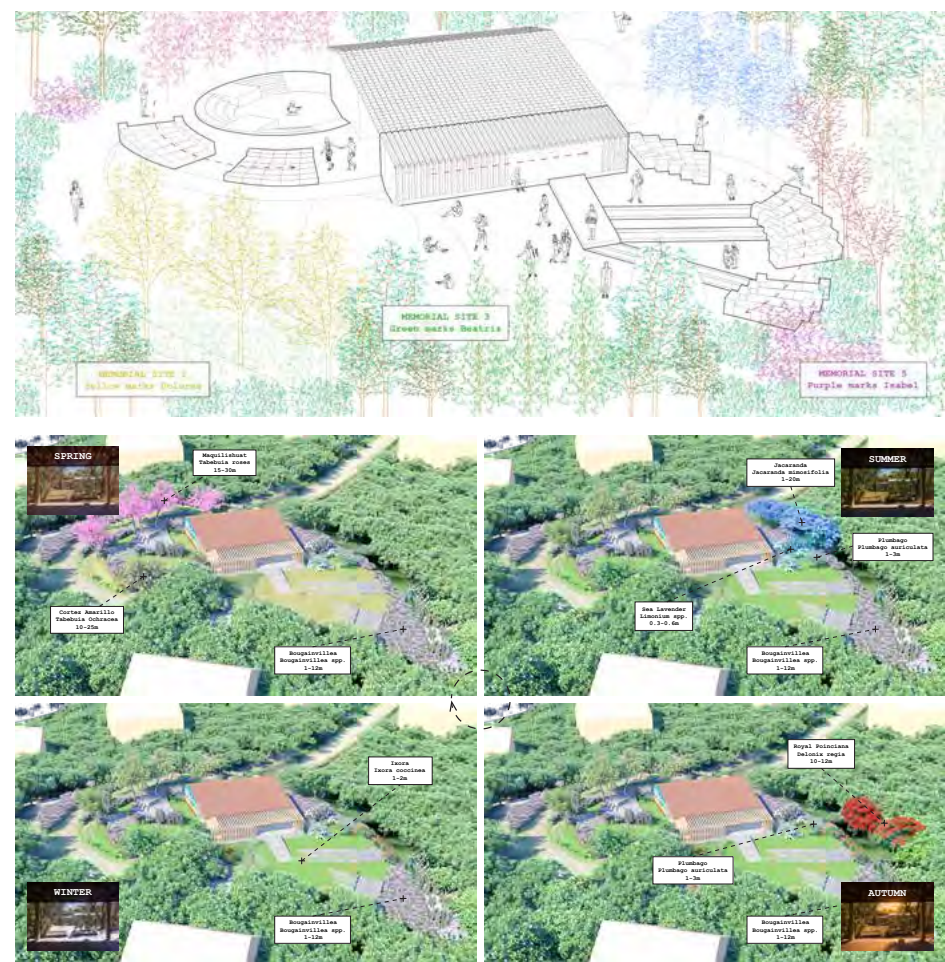
ROOFTOP GARDEN / COWORKING

Rugosa Rose becomes a favorite for the Mason bee, alongside the dogwood petals and flowering currant, all summer blooming plants

Rose of Sharon is a late-summer nectar bridge for late-flying butterflies.

Late elderberries taken by arriving autumn flocks.





Nonhuman Integration — February 11, Guancora

The project began with a plant. Inside one of the bombed houses at Guancora something had taken root and was growing through the rubble, unidentified and untended. It had arrived on its own. The ruin, read as a site of human loss, had quietly become a site of nonhuman arrival, communal return.

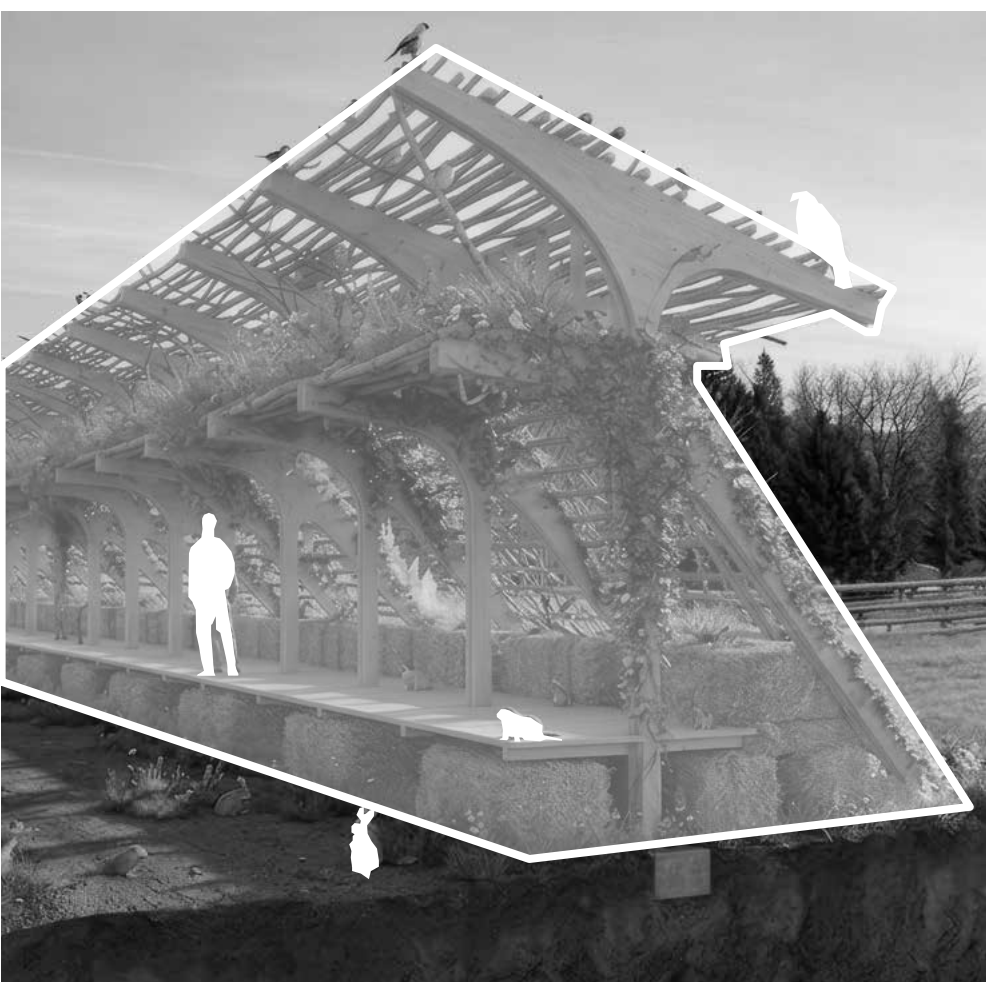
Plants are placed not to decorate the site but to collaborate in healing — color specific blooms, soil-building, pollinator-supporting, shade-giving — anchored to the year of the massacre, 1990. Five community-chosen colors — pink, blue, yellow, purple, green — relate to the people lost. They are each defined by specific species, so the palette of remembrance is spoken by the landscape itself across every annual cycle. Their bloom cycles coincide with the anniversary through ecological rather than symbolic means. What began as an architectural response to a human event became, through the plant in the ruin, a project that no longer treats the nonhuman as something arriving from outside the site. It was already there, and already at work. In healing, they both become interdependent.



Toison d'Or

The tower sits directly across Boulevard de Waterloo from a small park at the foot of the Palais de Justice, on the outer edge of an ecological corridor stretching toward the Bois de la Cambre and the Forêt de Soignes. Migratory birds — blackcaps, redstarts, whitethroats in summer, redwings and fieldfares in winter — already move along this gradient. The building, in its original sealed state, acknowledged none of it.

The atrium intervention makes the tower porous to this movement. Carved carefully around existing structural beams and columns — re-adapting rather than demolishing — the atrium becomes a vertical habitat passage running the full height of the renovated section. Adjacent terraces extend this porosity outward toward the boulevard. Below, the bike café's spent coffee grounds are composted into atrium soil, closing a material loop between the building's program and the nonhuman ecology it now admits. The building no longer turns away from where it is.



Wilson Creek House

It treats its envelope as habitat infrastructure rather than enclosure. Hay bale walls — load-bearing in the building's first life — host an active community of burrowing nonhumans from day one: deer mice and meadow voles tunneling between bales, jumping mice and shrews working the warm interstices, ground beetles and native solitary bees (mason and leafcutter species) colonizing the dry straw cavities. As the bales compost over five-to-seven year cycles, they're rotated out into the field as soil amendment, the structural frame re-packed with fresh hay, and the burrow community simply re-establishes — a successional architecture rather than a static one.

The upwind snow fence, calibrated at three to six fence-heights of offset, precipitates drift inside the courtyard, where meltwater funnels to a buried cistern and discharges to Wilson Creek in summer. Across spring pollinators, summer foragers, and winter fruit economies, nine documented nonhuman actors — bumblebees on currant, tanagers in chokecherry, waxwings on juniper — use the structure as armature.

Columbia GSAPP 2025 -
A4005A_005 Advanced Architectural Design Studio

FALL 2025

Professor: Joseph Zeal-Henry

Associate Faculty: Khloe Swanson

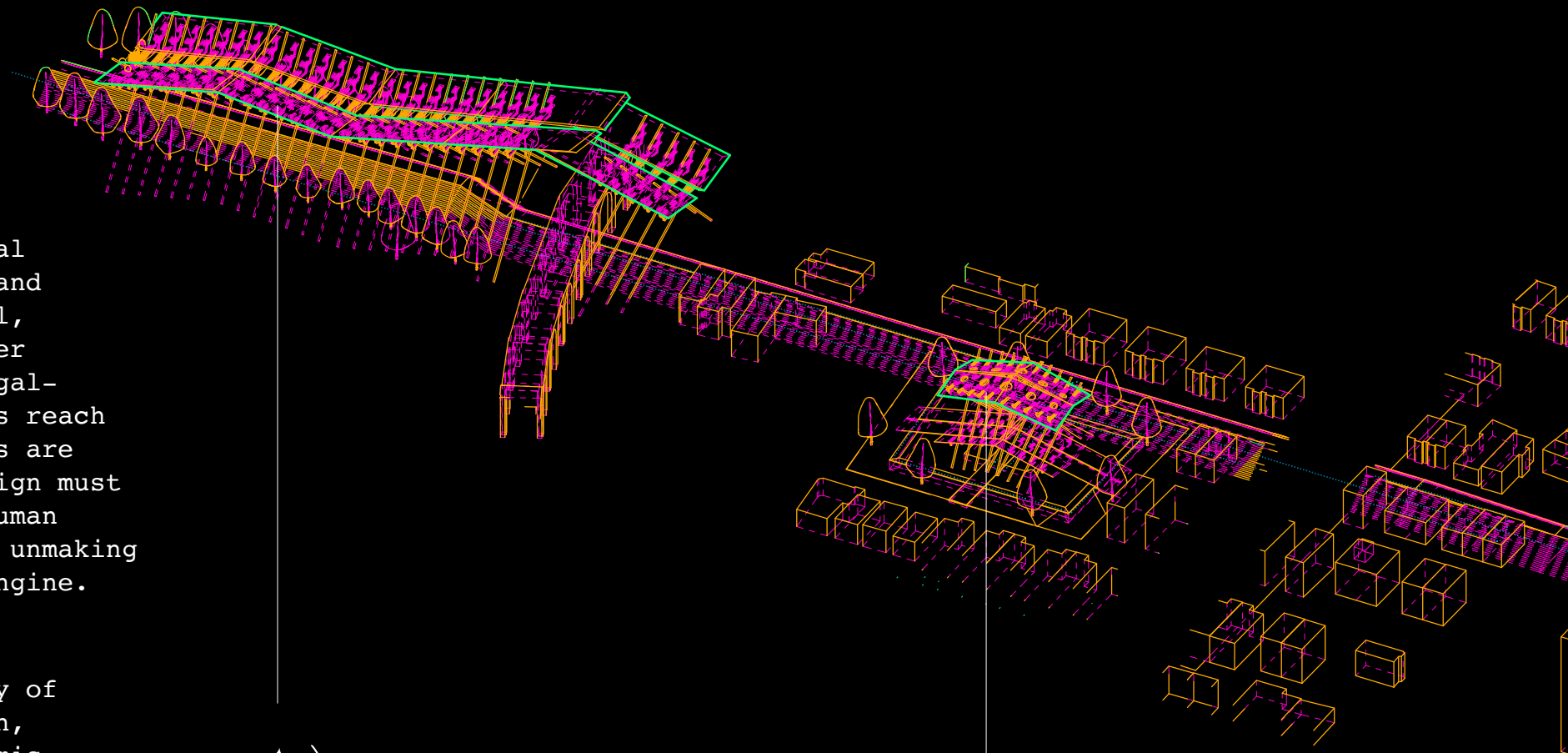
Oral (Infra)structures_Beach

THE BREAKDOWN OF THE BICAMERAL MIND

The Breakdown of the Bicameral Mind is a coastal infrastructural proposal sited in Far Rockaway at the threshold between ocean and bay—but its true scale spans the entire hydrological, political, and cultural geography of New York City. Building on a my summer term’s research on the Hudson River, its aqueducts, and the legal-political personhood surrounding it, this fall 2025 extends its reach and furthers the scope to argue that New York’s infrastructures are already relational ecologies - and that any future coastal design must dismantle the binary logics that have historically separated human systems from nonhuman worlds. This dismantling—this deliberate unmaking of the “two chambers” of thought—is the project’s conceptual engine.

At Rockaway Beach, this binary is materially visible. A century of engineering “corrections”—beach nourishment, jetty construction, dredging, zoning—has attempted to stabilize an inherently dynamic coastline, while simultaneously restricting access for the very communities living closest to the water. As Sabina Sethi Unni’s thesis (GSAPP, 2023) shows, the east-west divide in Rockaway is not a natural fact but a racialized planning outcome, where public housing was concentrated in the east, alongside an adjacent lack of water access on the east that created, in effect, a devastating pattern of drownings among Black and brown youth in East Rockaway.

This is also the landscape where endangered species such as the piping plover find refuge arguably because it is under-resourced: human investment and human attention have been unevenly distributed across the Rockaway peninsula. The region’s ecological precarity and social precarity mirror one another. Any new infrastructure must therefore act on both.



A) Bird Runway

A raised platform marking the first point where the boardwalk meets the ocean. The structure’s tilted, elevated roofs contain a soil bed deep enough for coastal grassland and scrub habitat, allowing migrating birds to perch, feed, and rest above human circulation. The roof planting palette includes bayberry, beach plum, eastern red cedar, seaside goldenrod, switchgrass, and little bluestem—species native to the Atlantic coast that provide berries, cover, and wind-buffered roosting zones.

This hybrid roof habitat turns the ocean edge into a shared threshold, where access is restored for residents while nonhuman species retain a continuous, elevated corridor. The runway initiates the boardwalk’s larger ambition: reconnecting ocean, habitat, and community through a single infrastructural spine.

B) Pavilion

The pavilion sits at the midpoint of the boardwalk where human circulation, restored water access, and coastal habitat converge. Its lifted roof structures support deep soil beds planted with native species—black cherry, eastern red cedar, pitch pine, bayberry, and sumac—creating an elevated ecological canopy for birds moving between the ocean dunes and the bay marshes.

Below this canopy, the pavilion houses the central water channel, an aqueduct-like conduit that brings ocean and bay water directly into the heart of the neighborhood. This channel is not symbolic—it is an infrastructural correction. East Rockaway has long suffered from a complete lack of safe, direct access to the water, contributing to a disproportionate number of drownings among local youth.

By carrying water across the site, the pavilion becomes the moment where the boardwalk is not just a pathway, but an active redistributor of resources. The aqueduct brings water to people who historically had none, allowing wading, learning, and supervised interaction long before they reach the harbor bath. The pavilion therefore performs two essential roles at once:

Columbia GSAPP 2025 -
A4005A_005 Advanced Architectural Design Studio

FALL 2025

Professor: Joseph Zeal-Henry

Associate Faculty: Khloe Swanson

Oral (Infra)structures_Beach

THE BREAKDOWN OF THE BICAMERAL MIND

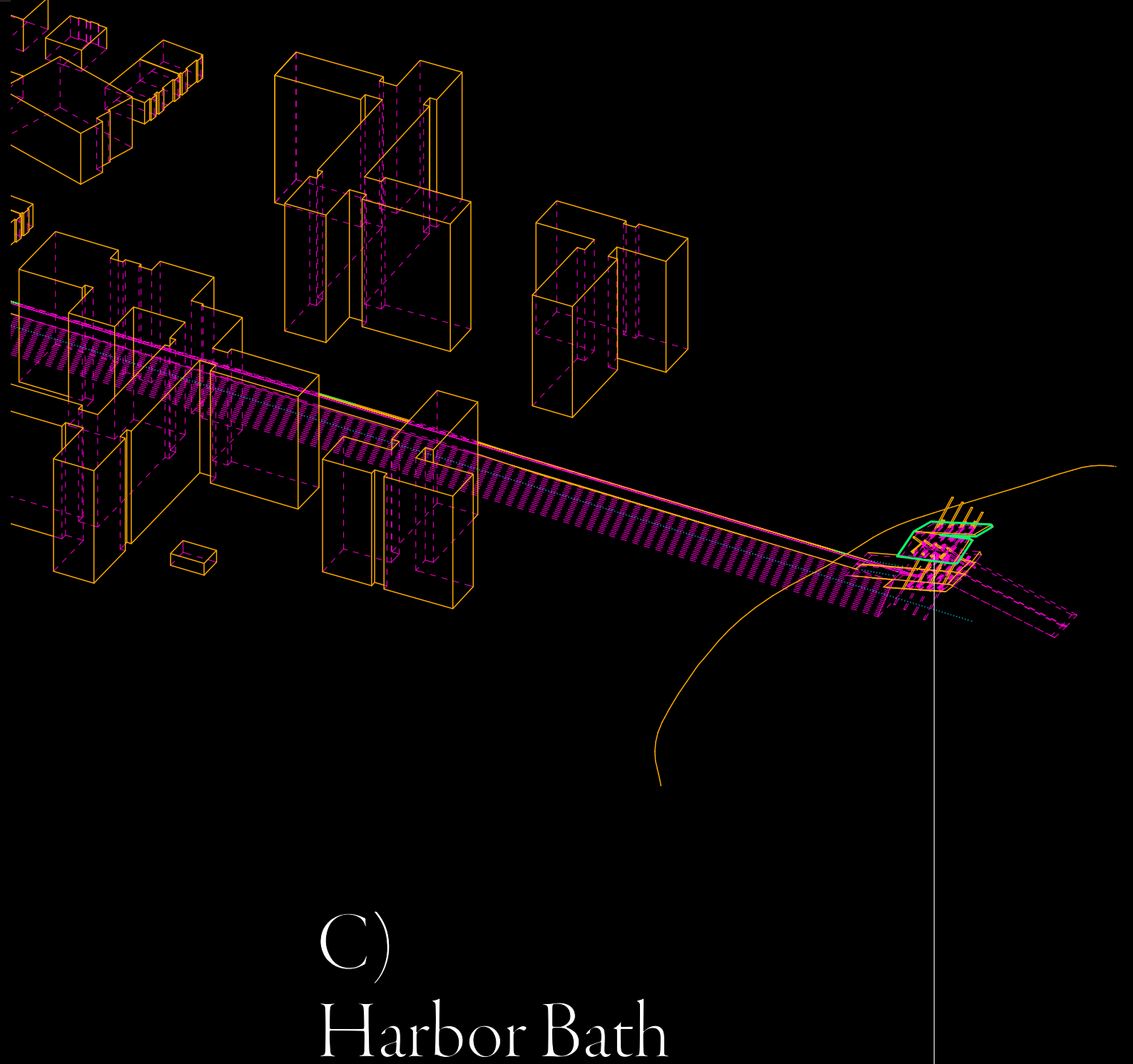
Toward a Poetics of Coastal Relation

Édouard Glissant's Poetics of Relation provides the project's foundational framework. Glissant insists on the right to opacity—the right of beings, ecologies, cultures, and territories to remain irreducible to singular interpretations or exploitative clarity. The coastline at Rockaway, with its layered histories of dredged sand, informal stewardship, FAA-regulated airspace, bird habitat, and community struggle, exemplifies this enmeshed and myopic transparency of the Anthropocene. Rather than rationalizing it into a new technocratic plan, The Breakdown of the Bicameral Mind proposes to work with this relational thickness, allowing multiple ecologies and publics to inhabit the same infrastructural frame.

This stance echoes my previous semester's work on the Hudson River as a legal personhood (see: SUMMER 2025 STUDIO), where water was treated not as a resource but as a political actor, carrying rights, histories, and demands. The aqueducts—Croton, Catskills, Delaware—were reframed as extensions of the river's body, not external machines. That research established a critical position: infrastructure is not separate from ecology; infrastructure is ecology. At Rockaway, this position becomes infrastructure.

Timothy Morton describes the Anthropocene's greatest illusion as the belief that humans stand outside nature—that we can manage, control, or perfect environments as if we are not embedded in them. Rockaway is full of such failures: symbolic fencing around dying dune plants, piping plovers that are affectedly removed not by immediate human destruction, but the mess of the Anthropocene: feral animals, predators renegotiating their own habitats, radar systems labeling birds as "hazards," and shoreline nourishment cycles that temporarily accrete sand in certain westward areas, only for it to be eroded soon after, east of it. The project accepts that infrastructure can be both human and nonhuman; both protective and permeable; both civic equipment and habitat; both access and refusal. It designs for entanglement, not separation.

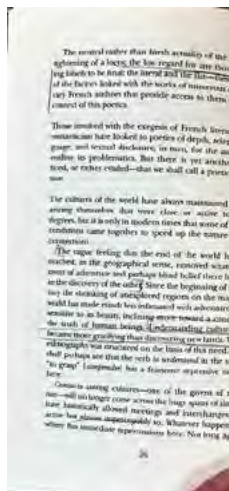
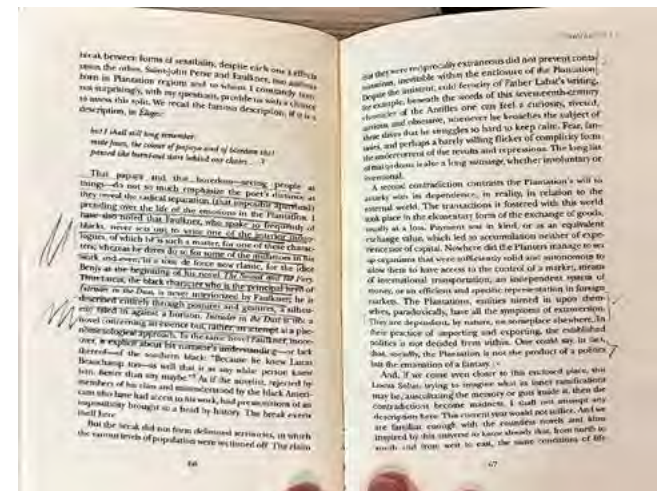
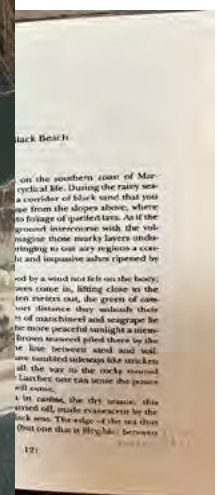
Following Sabina Sethi Unni's 2023 GSAPP AUD thesis, the project foregrounds the politics of access. The east Rockaway community lacks the most basic infrastructural element of coastal life: safe entry into the water. This design confronts that inequity head-on by treating access not as an amenity but as a right. The boardwalk spine, integrated aqueduct channel, and harbor bath reinterpret the logic of New York's aqueducts. Just as the Croton Aqueduct once brought clean water to a city in crisis, the Rockaway Aqueduct brings equitable water access into the neighborhood—literally transporting ocean and bay water inland before releasing it into a graduated sequence of engagement.



C) Harbor Bath

At the Jamaica Bay terminus, the harbor bath provides a safe, graduated sequence of tidal pools for residents who have long been denied access to the water. Adjacent to the pools, the roofed structures carry native bay-side species such as saltmeadow cordgrass, marsh elder, groundsel tree, seaside rose, bayberry, and eastern red cedar, creating a sheltered corridor for birds moving between the bay marshes and the ocean dunes.

The roof habitat mirrors the gradient of the tidal pools below: deeper soil zones for shrubs and small trees, thinner edges for grasses and pollinator plants, all forming a stepped ecological profile that transitions smoothly into the bay landscape. The harbor bath completes the boardwalk's mission by delivering safe water access for people and continuous habitat for nonhuman species.

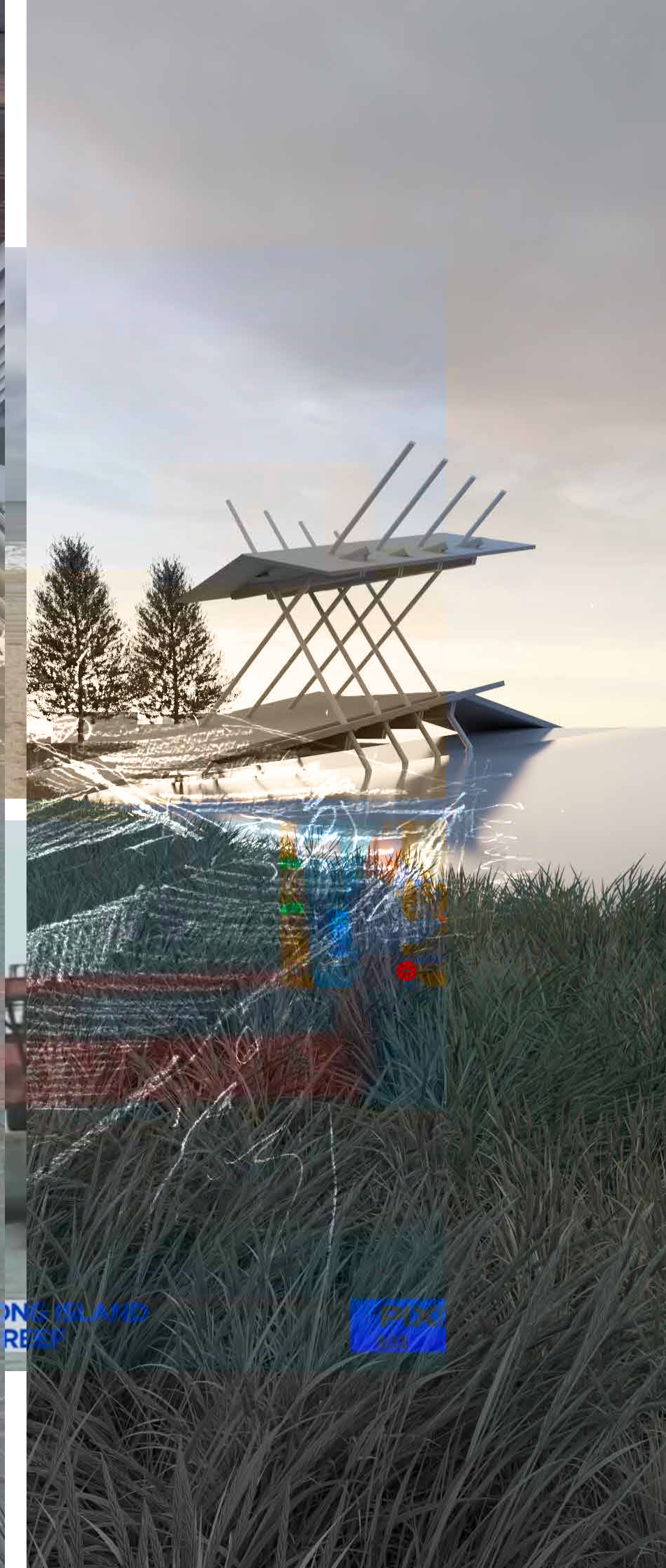
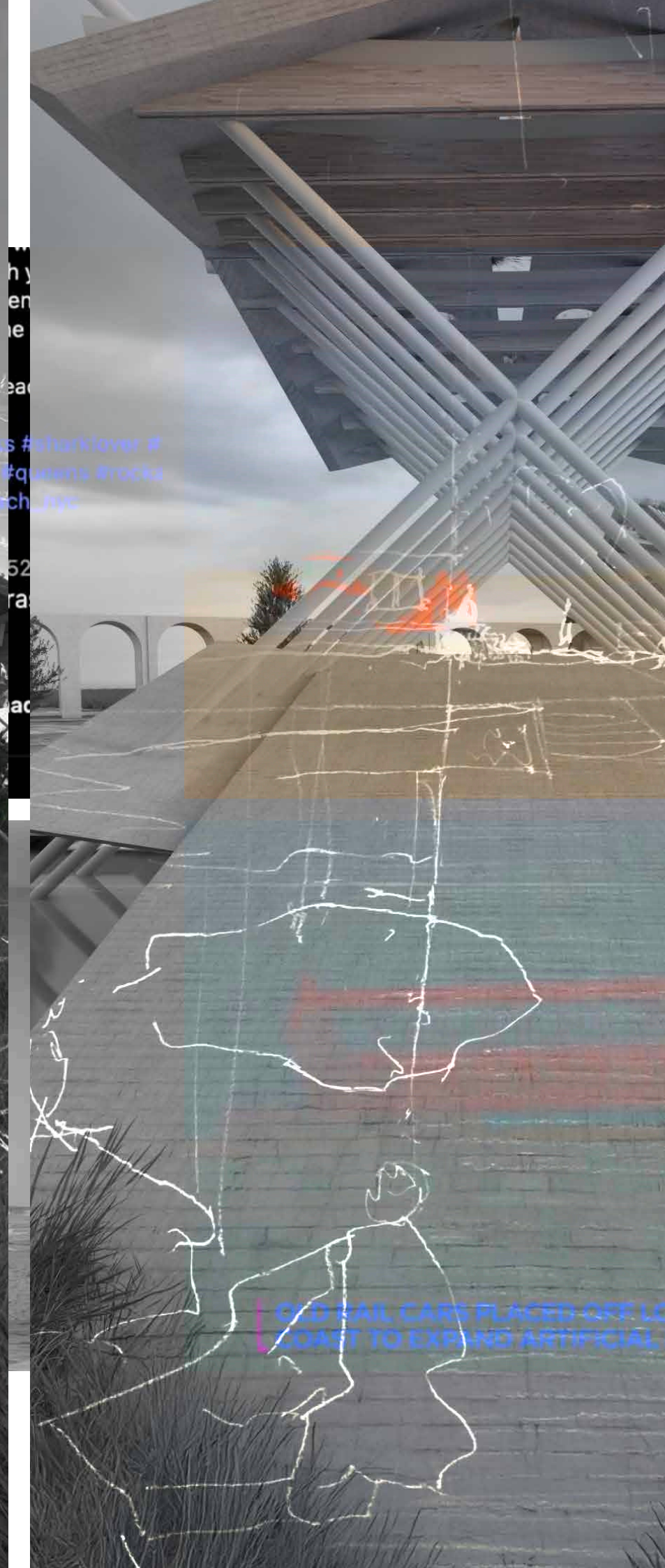
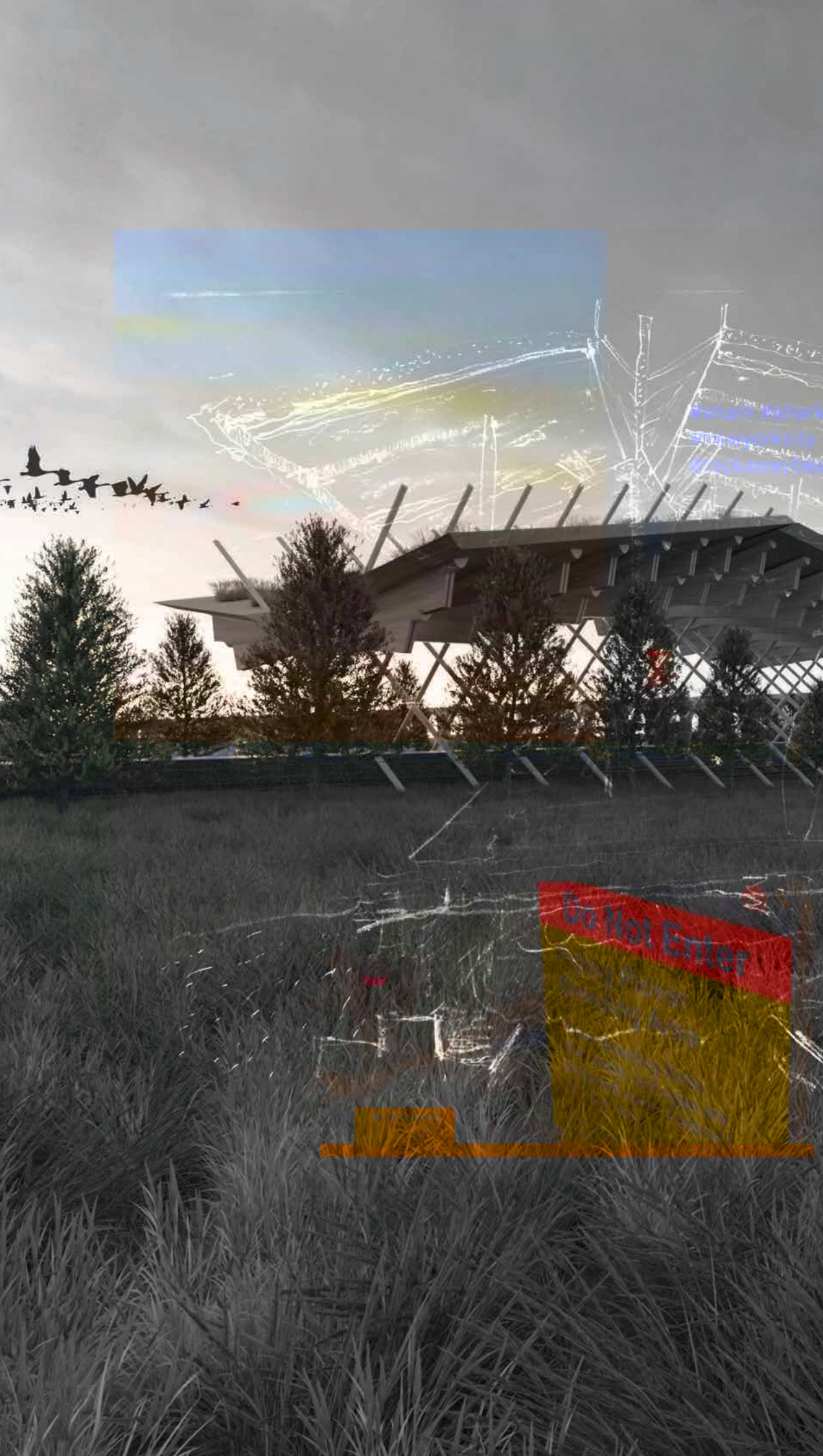


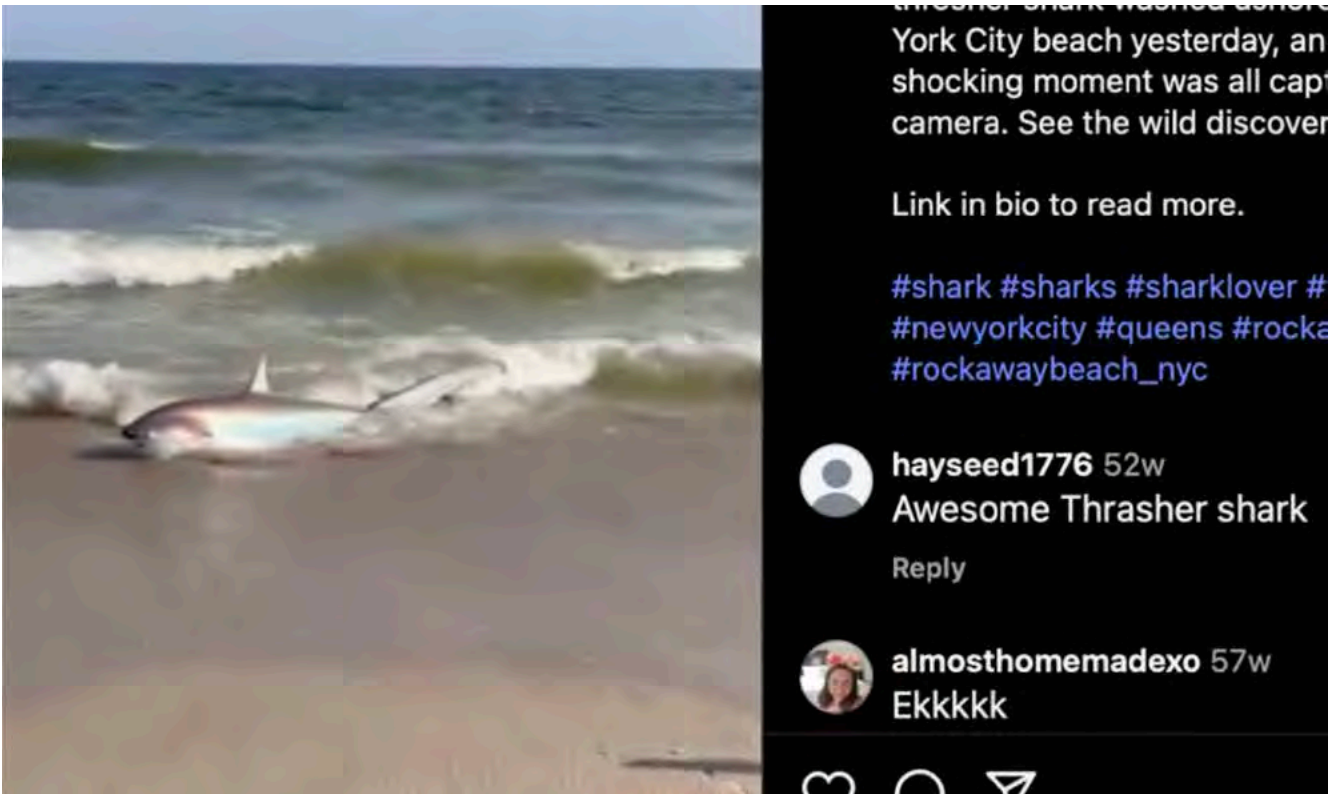
Édouard Glissant. *Poetics of Relation*. Translated by Betsy Wing. (Ann Arbor: University of Michigan Press, 1997).



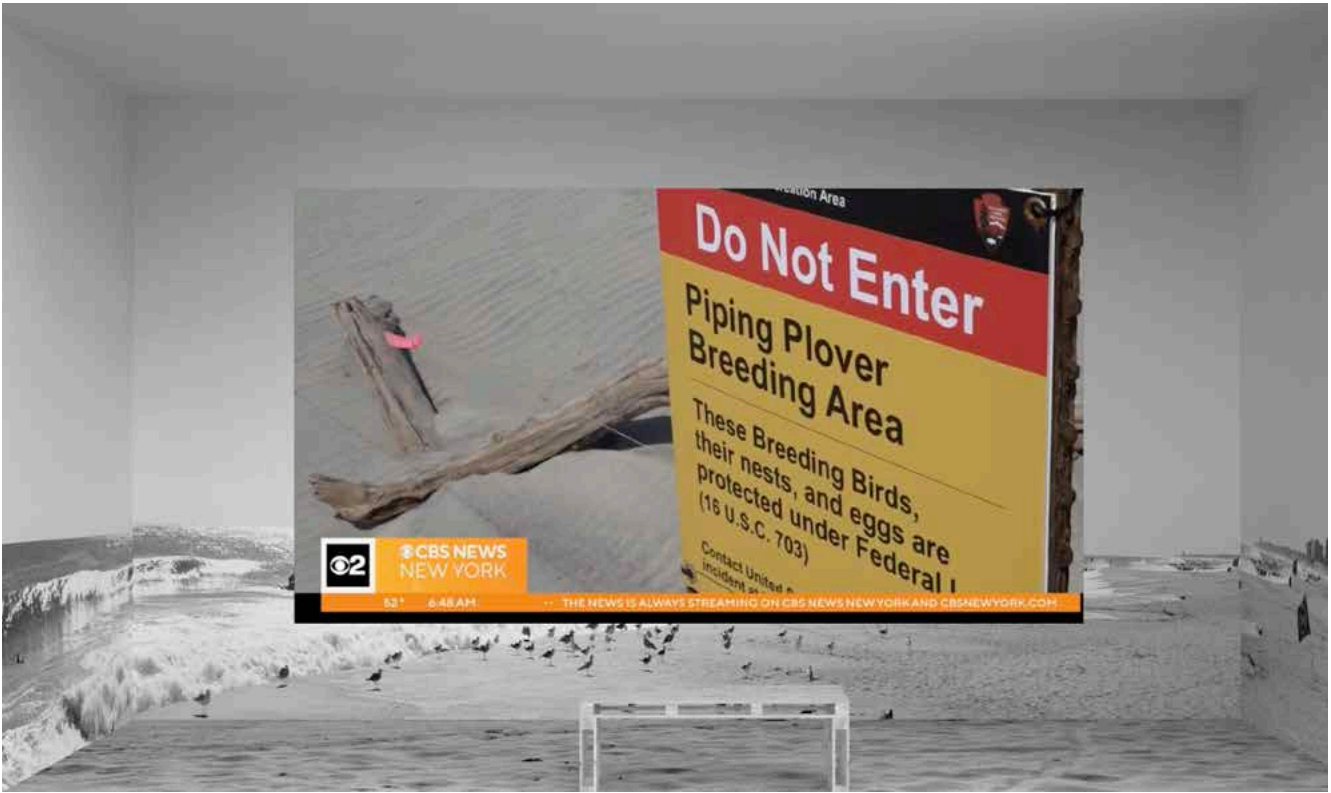
CLASS B PROTECTED AIRSPACE AROUND NEW YORK CITY







Movie Stills



The breakdown of the bicameral mind.

The Breakdown of the Bicameral Mind is not only a title — it is the conceptual engine of the project: a deliberate dismantling of the mental, political, and infrastructural binaries that once kept “human” and “nonhuman” in separate chambers of thought. The work proposes a new coastal logic where access, habitat, water, and movement are fused into one interdependent ecology — a single mind, a single system, a single continuous landscape.

The title The Breakdown of the Bicameral Mind signals a collapse of the artificial partition that has long separated human thought, human agency, and human territory from the wider ecological world. Julian Jaynes described the “bicameral mind” as a structure divided into two chambers — one issuing commands, the other obeying — a mental architecture based on separation, hierarchy, and rigid distinction. My project adopts this idea metaphorically: modern coastal infrastructure has been organized as if the human and the nonhuman were two separate chambers, each with its own logic, its own territory, and its own rights of access.

This division is precisely what Timothy Morton identifies as a false inheritance of the Anthropocene — the belief that humans stand “over and against” nature, managing it from the outside. Morton’s work insists that any future ecology must break down this binary and recognize the deep entanglement of species, forces, infrastructures, and environments. There is no separate chamber. No “over there” where nature lives. No pure human zone. Everything is already mutually embedded.

This project stages that breakdown physically. The boardwalk, the aqueduct-like water channel, the raised coastal roof structures, the underwater gabion reefs — all of them are designed as shared systems where human access and nonhuman habitat are not oppositional but mutually sustained. Water is carried into the community that historically had none; habitat is lifted above circulation; ocean and bay are connected; species move across the same architecture that people do.

Continuous Access Boardwalk: Ocean - Pavilion - Bay

Raised Public Walkway with Integrated Water Channel

Raised Bird Runway

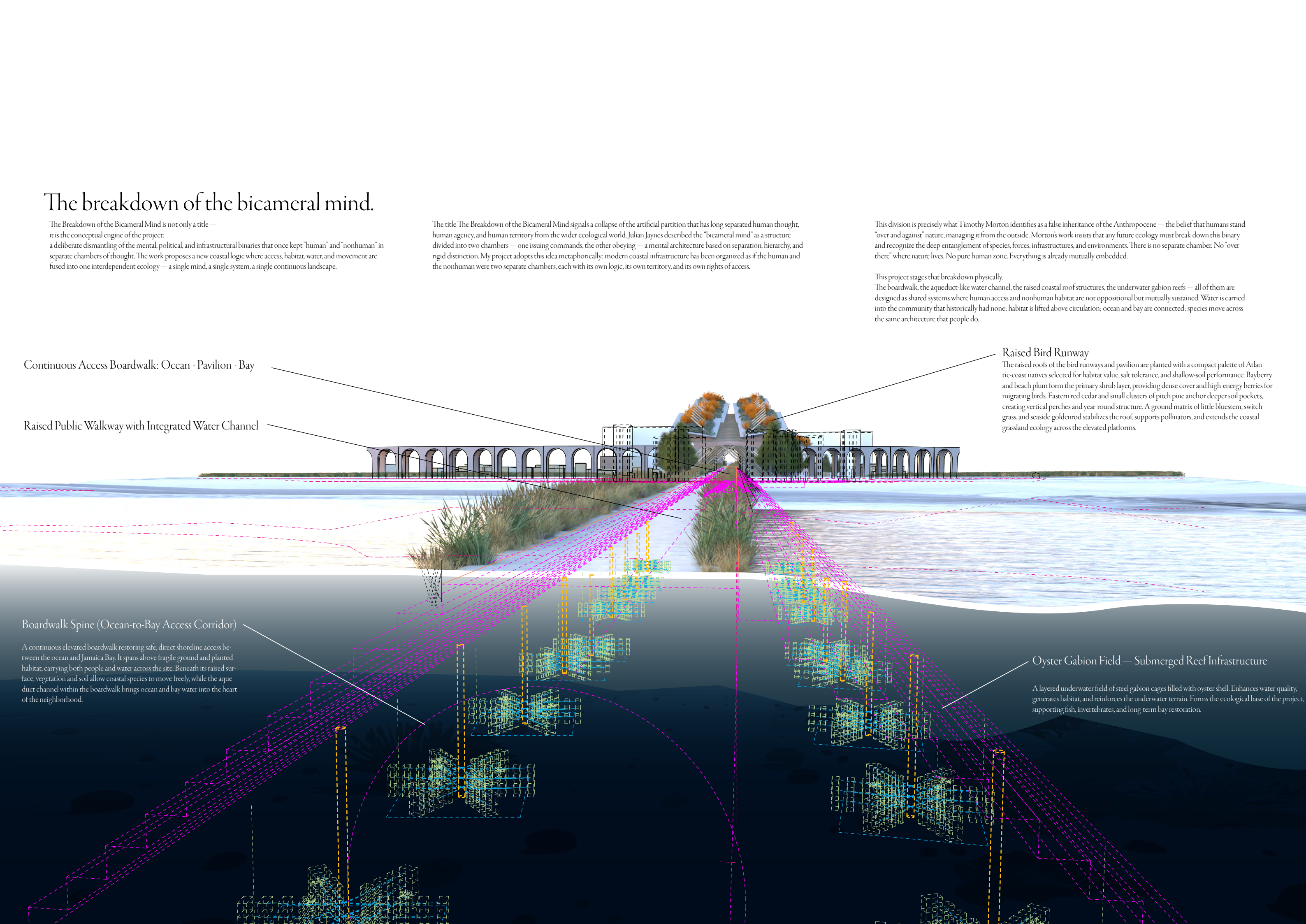
The raised roofs of the bird runways and pavilion are planted with a compact palette of Atlantic-coast natives selected for habitat value, salt tolerance, and shallow-soil performance. Bayberry and beach plum form the primary shrub layer, providing dense cover and high-energy berries for migrating birds. Eastern red cedar and small clusters of pitch pine anchor deeper soil pockets, creating vertical perches and year-round structure. A ground matrix of little bluestem, switchgrass, and seaside goldenrod stabilizes the roof, supports pollinators, and extends the coastal grassland ecology across the elevated platforms.

Boardwalk Spine (Ocean-to-Bay Access Corridor)

A continuous elevated boardwalk restoring safe, direct shoreline access between the ocean and Jamaica Bay. It spans above fragile ground and planted habitat, carrying both people and water across the site. Beneath its raised surface, vegetation and soil allow coastal species to move freely, while the aqueduct channel within the boardwalk brings ocean and bay water into the heart of the neighborhood.

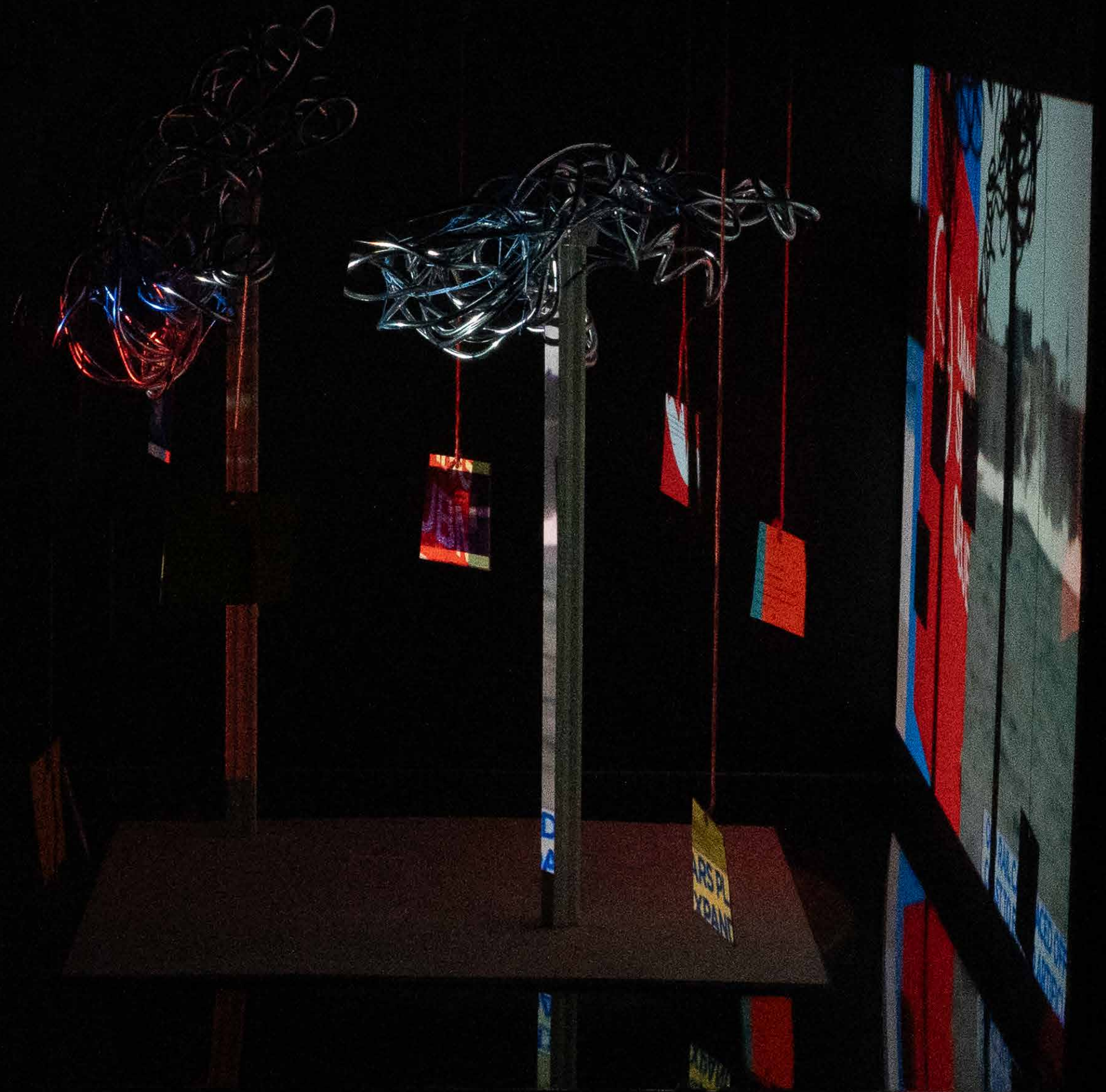
Oyster Gabion Field — Submerged Reef Infrastructure

A layered underwater field of steel gabion cages filled with oyster shell. Enhances water quality, generates habitat, and reinforces the underwater terrain. Forms the ecological base of the project, supporting fish, invertebrates, and long-term bay restoration.



Final Projection on top of model to express the relational experience of giving something up that we value. For me it was my wedding ring. No one is more important and a week without it on my ring finger prompted a whole series of hidden worlds. What we see here is a layering of shadow, of what shadow and loss derive out of light.

FINAL VIDEO:
<https://drive.google.com/file/>



Final Essay
Arguments, Summer 2025
Columbia GSAPP

Instructor: Foivos Geralis
Professor: Lydia Kallipoliti

The assignment asked
for us to use rhetoric to
form a worldview based on the
term's themes and arguments.

The assignment also
asked for the medium to
reflect our understanding of the
theories we were arguing.

Chris Smith
Foivos Geralis
Arguments
August 09, 2025

I just got kicked in the biosphere

"What is dark ecology? It is ecological awareness, dark-depressing. Yet ecological awareness is also dark-uncanny. And strangely it is Dark-sweet..."¹

The readings Arguments 2025 are united in their acceptance of dark ecologies. This was first understood during Areti Markopoulou's week 06 readings within IaaC Bits 9. Placed at the introduction of the IaaC text is a synthesis formed via the *Megapolis Dictionary of Advanced Architecture's* definition of *Active / Bold ecology* and the definition above from Timothy Morton.²

"A bold ecology...an ecology in which sustainability is interaction. In which natural is also artificial. In which landscape is topography (and topology)...that gives way, then, to the black-dirty warmth of those reactive and

operative answers, definitively stained with materiality."³

It is a primary connection between the texts, their arguments, and our present anthropomorphic world: the separation from the environment and our inherited (read: accepted) narrative of it is a constructed fiction. The readings for Arguments enter a strange loop where the more we are taught how far from the *biosphere we actually have built ourselves*, the more we must also include within it the unpredictable material noise of that built biosphere to become closer to the whole. By so doing, it helps us unlearn that inherited separation of environment.

Therefore, a Möbius Strip is the surface upon which my booklet's text is set. Supporting it is a vertically abstracted series of pages, a plywood "book" from which dark ecology rises, including within it the human-centric mess of our present biosphere. The Möbius strip acts as a metaphor for the complete reorientation the Summer Term provided. Rising out of the anthropocentric world represented by stacked and laminated wood, margins, boundaries, dyes, composite glues... the strip - as Timothy Morton reminds us - relates specifically to dark ecology as

it is a "nonorientable surface' lacking a back and front.no inside or outside. The curve is the entire surface." The messiness of this hybridization challenges a strict anthropocentric definition of spatial boundaries with no defined beginning and end. It is the counterpoint to a sheet of paper. It provokes questioning. The booklet should be touched and rotated in hand. By sequencing the logic of my booklet in this way, I am also arguing for a material expression of a logic that is defined by engagement - it cannot be read from one perspective.⁴

This approach reframes the text previously read in the term, for example, Anooradha Iyer Siddiqi's research of and within the Dadaab Commons. When writing about the architectural context Siddiqi writes the following:

"The Somali waab - an architecture for dwelling that persists beyond cultural ritual - offers an allegory for Dadaab, a place that is simultaneously liminal and

permanent, a site of displaced identity and the rebuilding of a new identity: a community whose interiority is at odds with its exteriority."⁵

I will extract from the underlined above one specific point: the liminality is intrinsic to the formation of Dadaab. No longer is an anthropomorphic division of interior /exterior boundary the relevant or accurate depiction of designed space. The transitional space itself is the space of the whole. The transition argues for a continuity that also appears in Stan Allen's week 01 text, *Field Conditions*. Set below and through Figure 01 on the following page:

'Field conditions' here implies the acceptance of the real in all its messiness and unpredictability...
...The rules of combination have less to do with the arrangement of distinct and identifiable elements, as with the serial aggregation of a large number of relatively small, more-or-less similar parts."⁶

1 Timothy Morton, *Dark Ecology: For a Logic of Future Coexistence* (New York: Columbia University Press, 2016), 5.

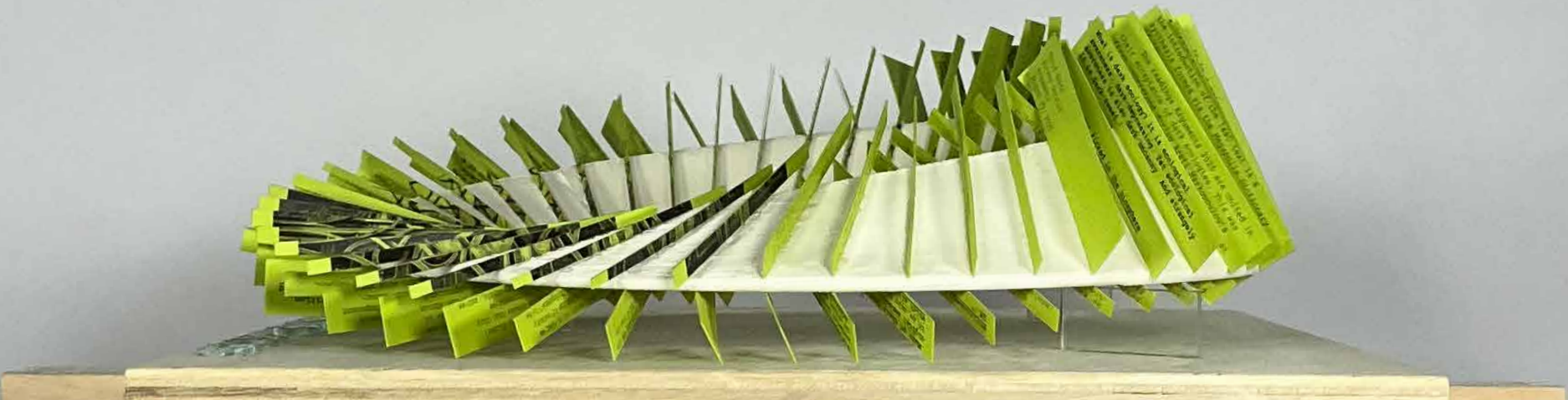
2 "Ecology, Active (or Bold)," in *The Metapolis Dictionary of Advanced Architecture*, ed. Manuel Gausa, Vicente Gualart, Willy Müller, Federico Soriano, José Morales, and Fernando Porras (Barcelona: Actar, 2003).

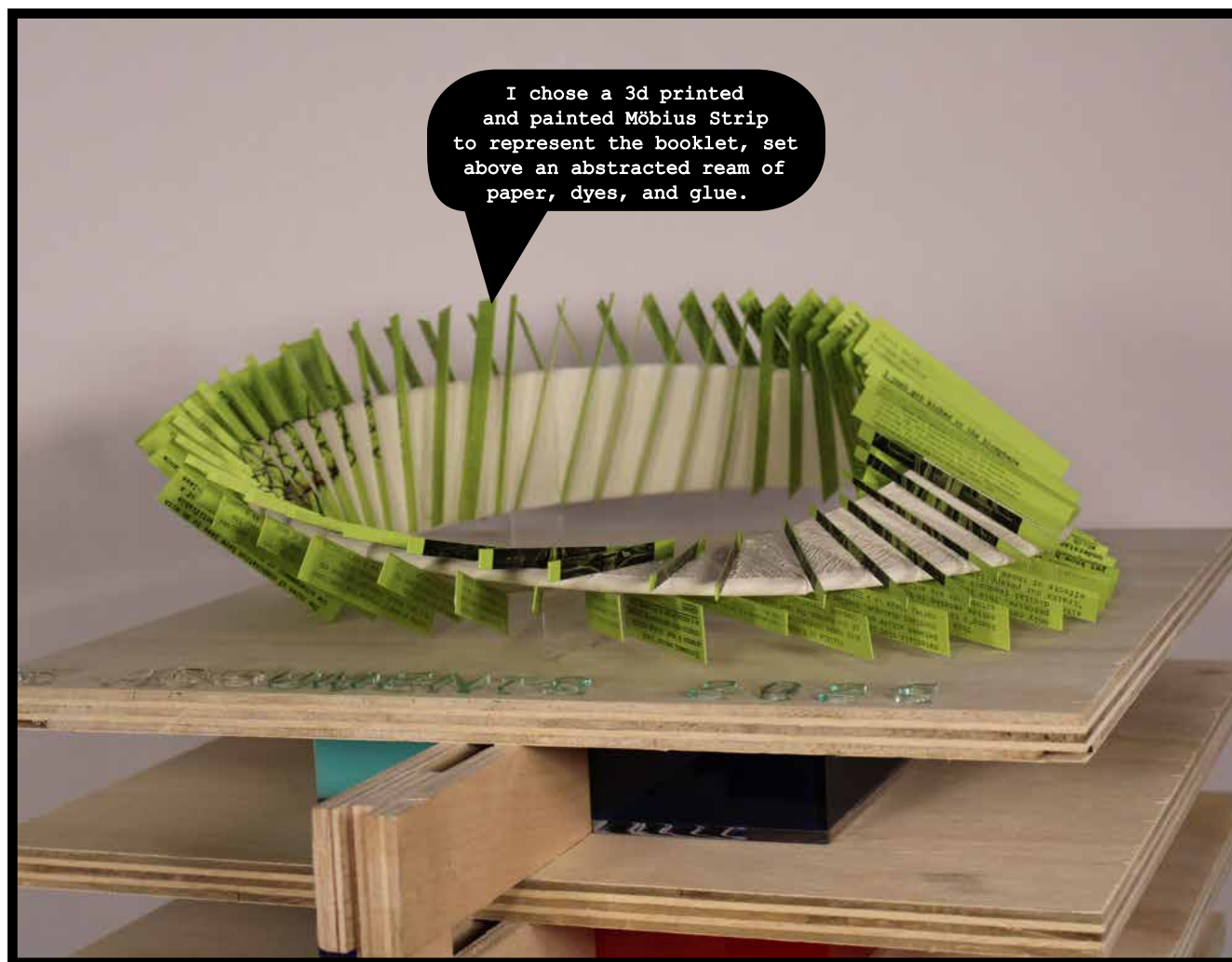
3 Areti Markopoulou, et al. *IAC Bits 9*. Barcelona: Actar Publishers, 2023, 3.

4 The inspiration for this shape was found when reading *Dark Ecologies* by Timothy Morton, itself an attempt by the author of this Booklet to explore the inspiration found within Areti Markopoulou's readings from Week 06. For a deeper analysis please reference his book: Timothy Morton, *Dark Ecology: For a Logic of Future Coexistence* (New York: Columbia University Press, 2016), 108.

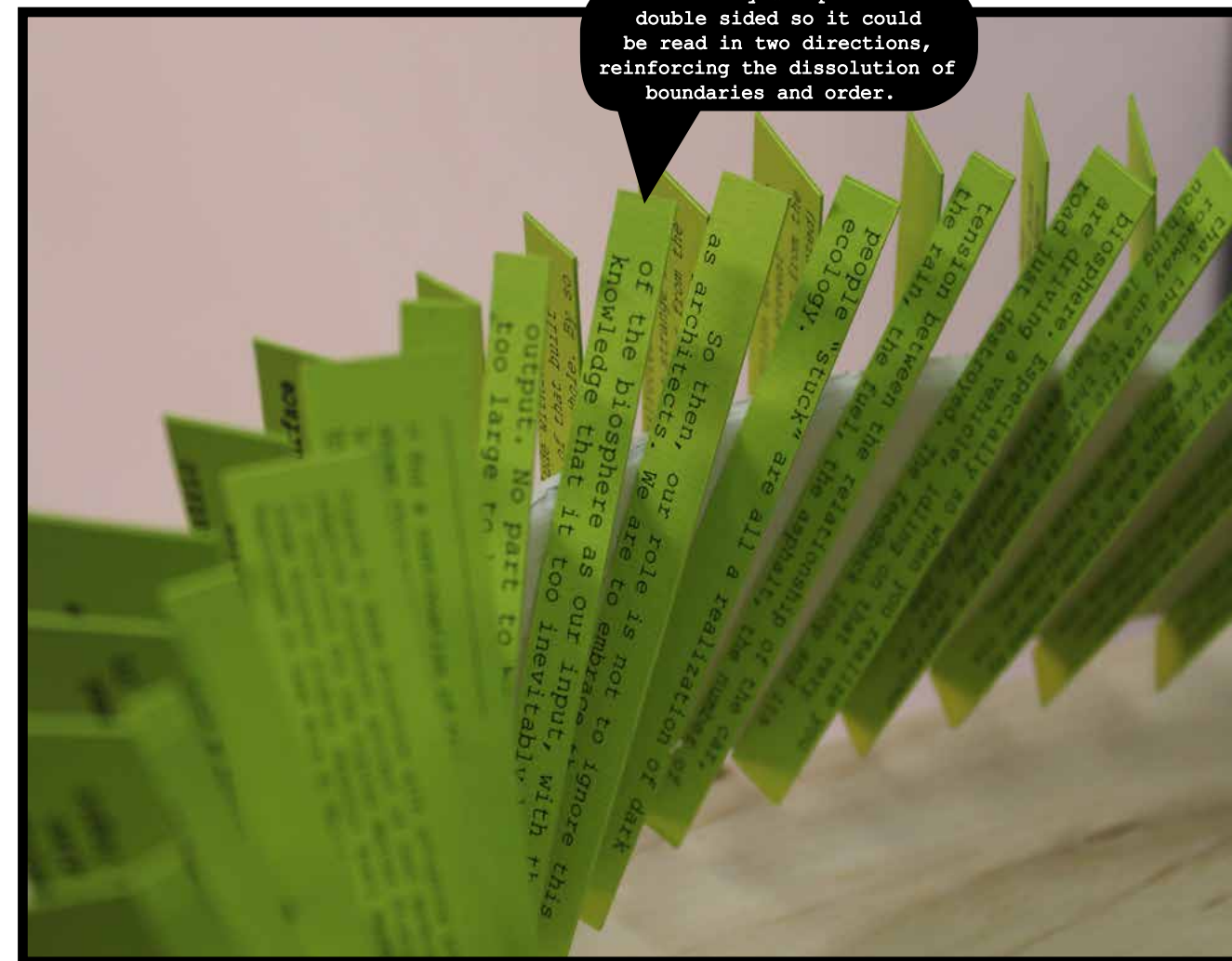
5 Anooradha Iyer Siddiqi, *Dadaab Commons* (The GoDown Arts Centre, March 2025), 18.

6 Stan Allen, *Practice: Architecture, Technique + Representation*, Expanded Second Edition (New York: Routledge, 2008), 217-218.





I chose a 3d printed and painted Möbius Strip to represent the booklet, set above an abstracted ream of paper, dyes, and glue.



The essay was printed double sided so it could be read in two directions, reinforcing the dissolution of boundaries and order.

So then, our role is not to ignore this of the biosphere as our input, with this output. No part to too large to

People "stuck" are all a realization of dark ecology. The tension between the rain, the road just destroyed. The road just destroyed. The road just destroyed.

That the road just destroyed. The road just destroyed. The road just destroyed. The road just destroyed. The road just destroyed.

Relevant arguments from the term's speakers were synthesized into the text, as well as images from their assigned readings.



Figure 1: "Highway 1, Intersection 105 & 110, Los Angeles California, USA, 2003" Edward Burtynsky, courtesy Charles Cowles gallery, New York / Nicholas Netivier Gallery, Toronto. reproduced in Stan Allen, *Practice: Architecture, Technique + Representation*, Expanded Second Edition (New York: Routledge, 2008), 232.

The mess is key. In Figure 01 it involves an aggregation of cars, homes, material, the interstate, terraformed earth - each as a collective "mess" within the image. It is then crucial to define this "messiness" that is colliding in Figure 1. The etymology of *mess* invokes an image of *prepared* food (conditions) on a table (field), whereupon the noise and multiplicity of it are integral to its definition.⁷ The mess we see is our collective biosphere, upon which we have placed, extracted and terraformed to an extent that the noise *is* the field condition.

⁷ Oxford English Dictionary, "messy (adj.), Etymology," March 2025, <https://doi.org/10.1093/OED/9273497004>.



Figure 2: Base structure with actuators and wirings of Remembrance, a shape-changing adaptive structure: project of IaaC developed at Master in Advanced Architecture 01 in 2014/2015 for the Digital Matter Studio. Researchers: Ji Won Jun, Matteo Silverio, Josep Alcover Llubià; faculty: Areti Markopoulou, Alexandre Dubot, Angelos Chronis. Reproduced in IaaC Bits 9, Barcelona: Actar Publishers, 2023, p. 106.

This noise is integral in the realized work for Areti Markopoulou's teams at IaaC as well. As is shown in *IaaC Bits 9*, there is a call to the contemporary reader that we must understand that this messiness is not to be avoided, but instead, embraced as part of the input of dark ecological design:

"[E]nvironmental conditions" in which parameters of "noise", pollution, attrition, corruption and/or hybridization are considered as a

substantive part of the processes being addressed.." ⁸

Visible in Figure 02, their synthesis with human interaction is a critical component of its success. The text calls for "Human-Computer Interaction" in concert with smart materials that is not just dichotomized between active and passive, but also in constant dialogue. Similar to the Möbius curve, there is a constant adaptation.⁸

This theme also appears in Michael Young's text, wherein he argues that this active sensing *is* the environment we humans are actively living within, and we only notice the small amount of it that we perceive. This looping mechanism of sensory digital feedback causes our "biosphere" to be altered only through this perception, and also "trains our perspective for how we sense the effects of those changes." ⁹

"The assignation of the term noise is a problematic response to stimuli that we do not yet know how to make sense of... ..This expansion, or redistribution, of aesthetics de-centers the human sensorium as our primary mechanism for accessing and understanding the world..

⁸ Areti Markopoulou, et al. *IaaC Bits 9*. Barcelona: Actar Publishers, 2023, 106.

⁹ Michael Young, "Hyperhomogeneity: or Attention Within the Background," draft manuscript PERSPECTA 56, accessed July 15 2025. 195.

¹⁰ —194-5.

¹¹ —202.

..Many of their [non-human sensing organisms, digital sensors] qualities are made sensible to us only through technological mediation, which alters both what we attend to in the environment and how the environment attends to us."¹⁰

Said another way, the attempt to filter ecological "noise" is precisely what distances us from ecological understanding. By expanding the breadth of input to include aesthetic relations "that do not always make sense" we reorient noise into "potentially useful information...[that]...marks a tension between wonder and reason, increasing in direct proportion to the acuteness of that tension."¹¹

For anyone who has been stuck in traffic along the Pacific Coast Highway in greater Los Angeles (a place Young is connected to) after a rainstorm, the truth to this is obvious. When looking at the surrounding ecology when you are "stuck" in traffic you will notice the ocean and likely notice a hillside eroded by running water, perhaps even a mudslide at the steepest slopes.

When you realize however, that the traffic jam is caused by a destroyed roadway due to that very mudslide, this is nothing

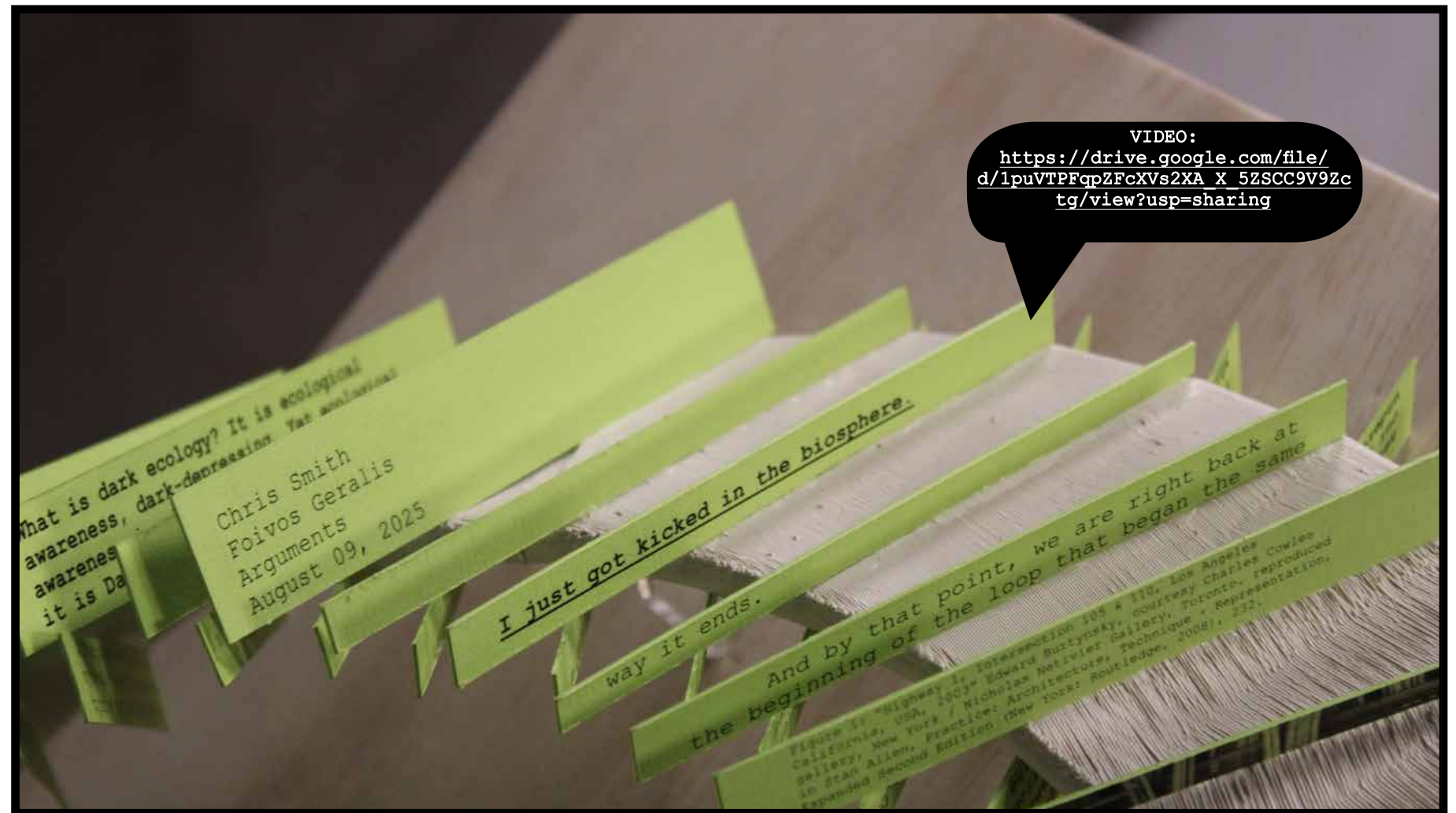
less than getting kicked in the biosphere. Especially so when you realize you are driving a vehicle, idling on that very road just destroyed. The feedback loop and its tension between the relationship of the car, the rain, the fuel, the asphalt, the number of people "stuck" are all a realization of dark ecology.

So then, our role is not to ignore this as architects. We are to embrace the totality of the biosphere as our input, with the knowledge that it too inevitably becomes the output. No part to be ignored because it is too large to be understood as the whole. So then, at the end, we become the biosphere kicking ourselves.¹²

And by that point, we are right back at the beginning of the loop that began the same way it ends.

I just got kicked in the biosphere.

¹² For a continuation of this see Žižek & SO ON PODCAST. This clip was shown this term in Transculturalities, Week 10. "Slavoj Žižek: The Path to Love Is Through Trash." YouTube video, 0:48. Posted 08 March, 2022. <https://www.youtube.com/watch?v=sQmc039N0jE>



Enactments
Transscalarities, Summer 2025
Columbia GSAPP

Instructor: James Heard
Professor: Lydia Kallipoliti

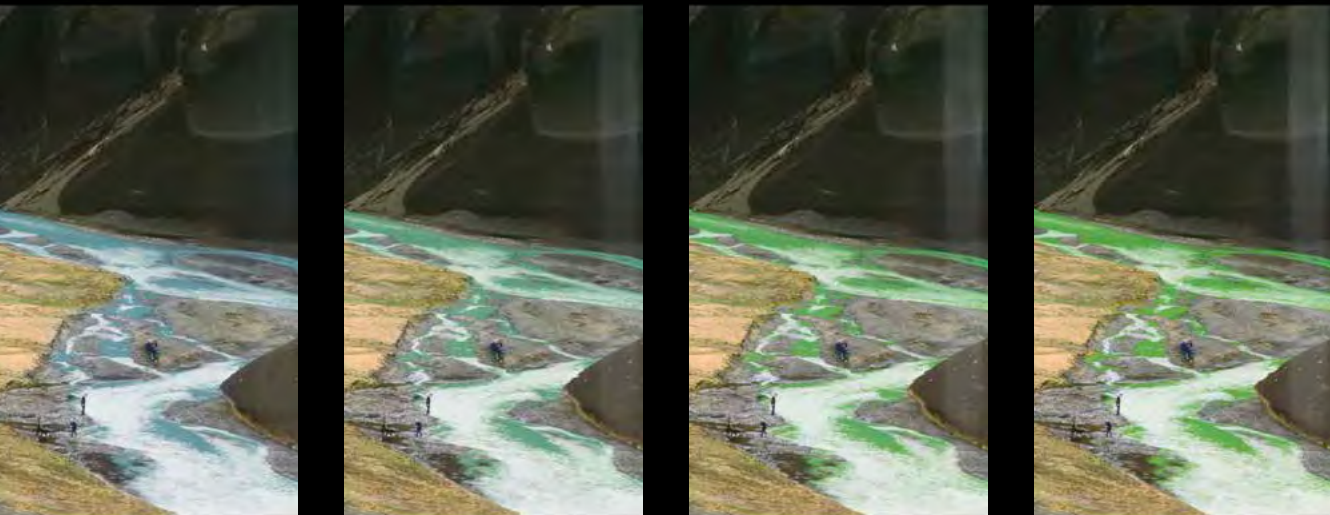


Figure 3.
Installation views: The Northern Fjallabak Route, Iceland, 1998. From "The Section on
'GREEN RIVER'," Studio Olafur Eliasson, 2008, p. 25.

Enactments
Transscalarities, Summer 2025
Columbia GSAPP

Instructor: James Heard
Professor: Lydia Kallipoliti



SETTING: Spree River, Museum Island, Berlin. 13:00, September
30, 1998 / The Northern Fjallabak Route, Iceland, 1998 /
elsewhere

Uranin. I am safe.
I am non-toxic.
I am now in the Fjallabak River. I was just in the Spree.
Does anyone know that on that day in Berlin, when I saw you
celebrating, a new form of objectification begun?

Am I now the river?

I begin to react to the current. More and more of what I am,
Is being poured into the river. They say I am non-toxic, used to
study currents by scientists.
I have been here before. Venice, 1968.
Olafur, have you met Nicolás?

I wonder what Donna Haraway would think of this.
What am I revealing to those who see me?
Does anyone know that my material data sheet indicates I am
harmful to septic systems, and that I am being poured into a
very urban river? Or that in 2015 researchers will publish a
paper citing questionable biodegradation levels of my presence.

Olafur, you don't believe that is the point.
You will carry me around the world.
You will introduce me, deploy me,
study me. You will take me to Iceland and deploy me into a river
that forms with snow melt from glaciers.

Don't we know that I am manufactured chemically?
 $C_{20}H_{10}Na_{2}O_5$,
Fluorescein Sodium Salt.
I am formed from phthalic anhydride and resorcinol under
intense heat and in the presence of a catalyst.
I am hygroscopic.
I am now water.
You, are not.

Why are we introducing a non-native being into our rivers
to draw attention to the instability of what I have now become?
Introduce something non-native, to describe an integral part a
river and its current.

Do I have rights?

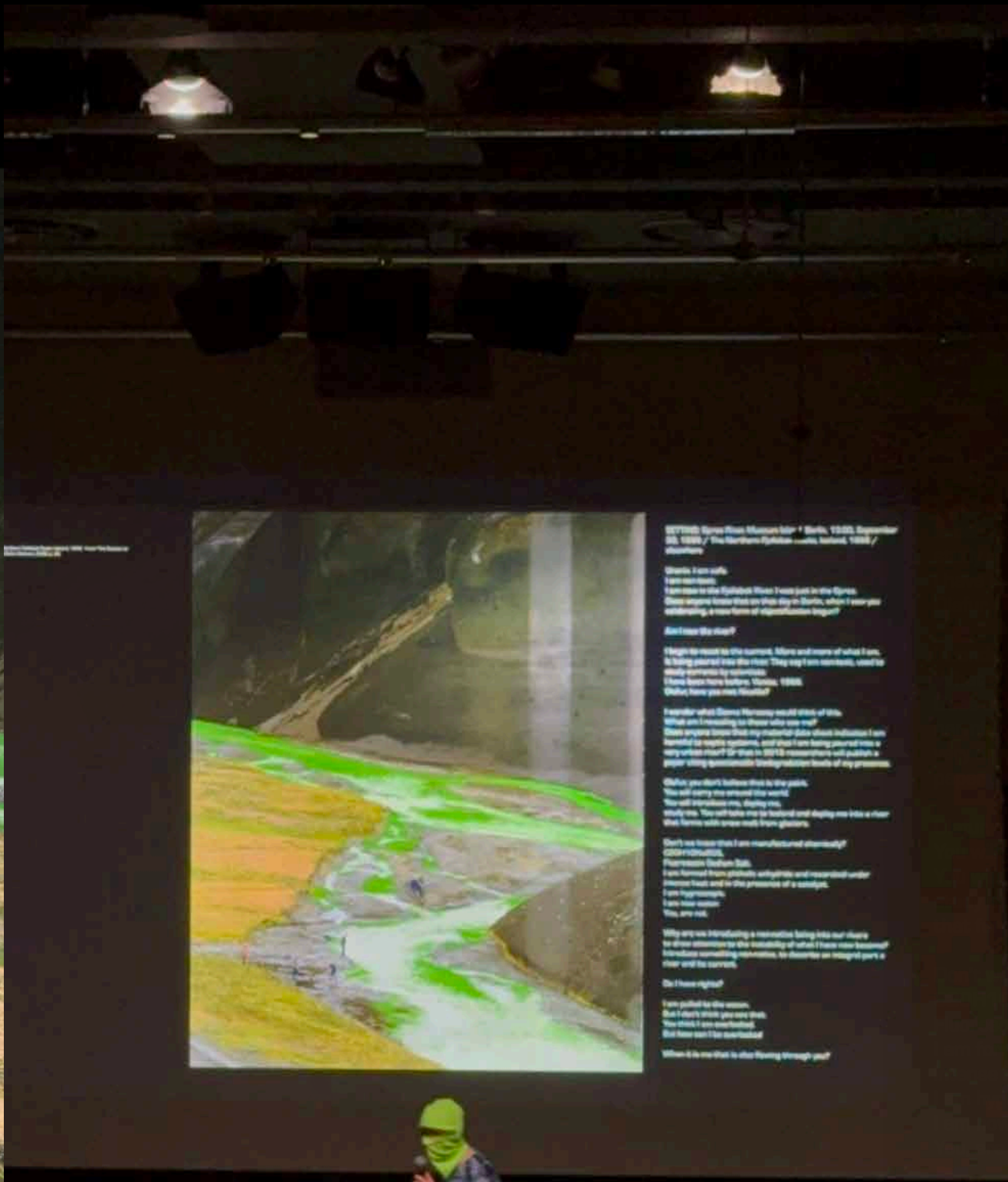
I am pulled to the ocean.
But I don't think you see that.
You think I am overlooked.
But how can I be overlooked

When it is me that is also flowing through you?

Figure 3.
Installation views: The Northern Fjallabak Route, Iceland, 1998. From "The Section on
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Enactments
Transscalarities, Summer 2025
Columbia GSAPP

Instructor: James Heard
Professor: Lydia Kallipoliti



Spree River, Museum Island, Berlin. 13:00, September
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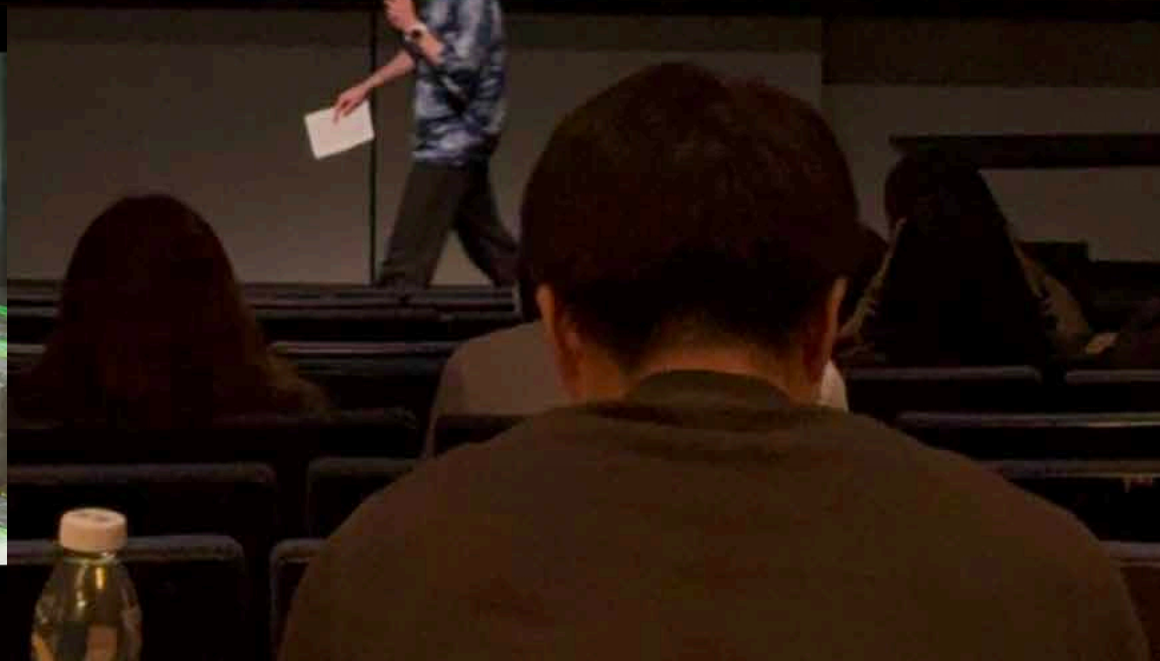
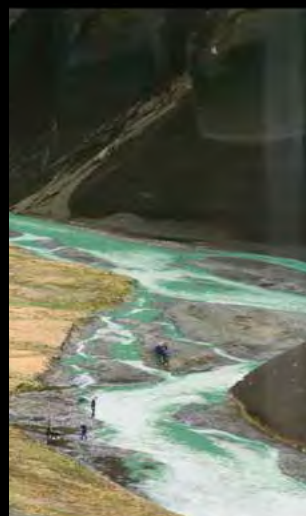
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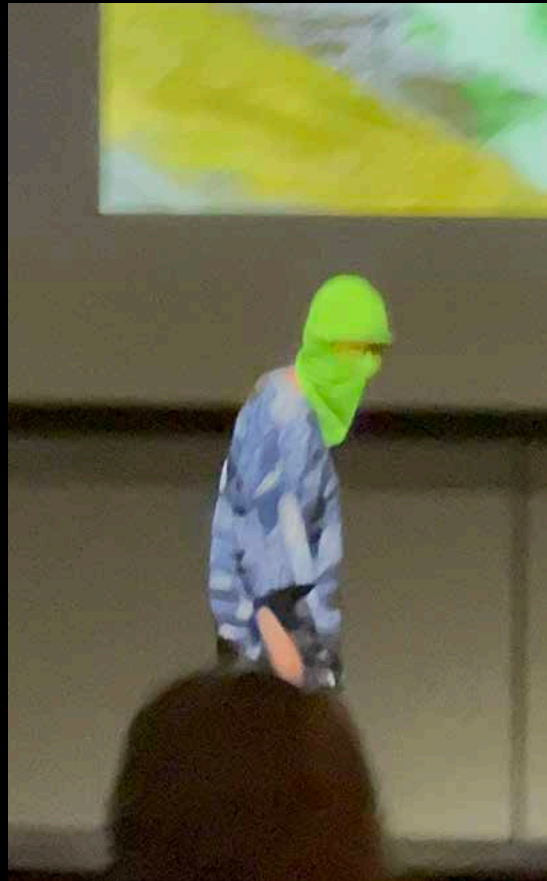
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Chris Martin Smith, RA
GSAPP AAD 2025-2026

Portfolio

