Volume 1

ARVIN TANG

NORTH FACADE

NORTH FACADE

The north façade typically receives indirect, diffuse daylight throughout the day, which creates a stable interior light quality and minimizes solar heat gain. Because it rarely gets direct sun, this façade often focuses on strong insulation and controlled glazing to maintain comfortable interior temperatures. Architects use it strategically for workspaces or galleries where consistent lighting is ideal. Large windows can frame views without worrying about glare, while shading is minimal. The north façade can also act as a calm, neutral backdrop in a building's overall composition, balancing more expressive sun-facing façades. In colder climates, careful detailing prevents heat loss, making this façade essential for energy performance, thermal comfort, and establishing a clear architectural rhythm within the building's envelope

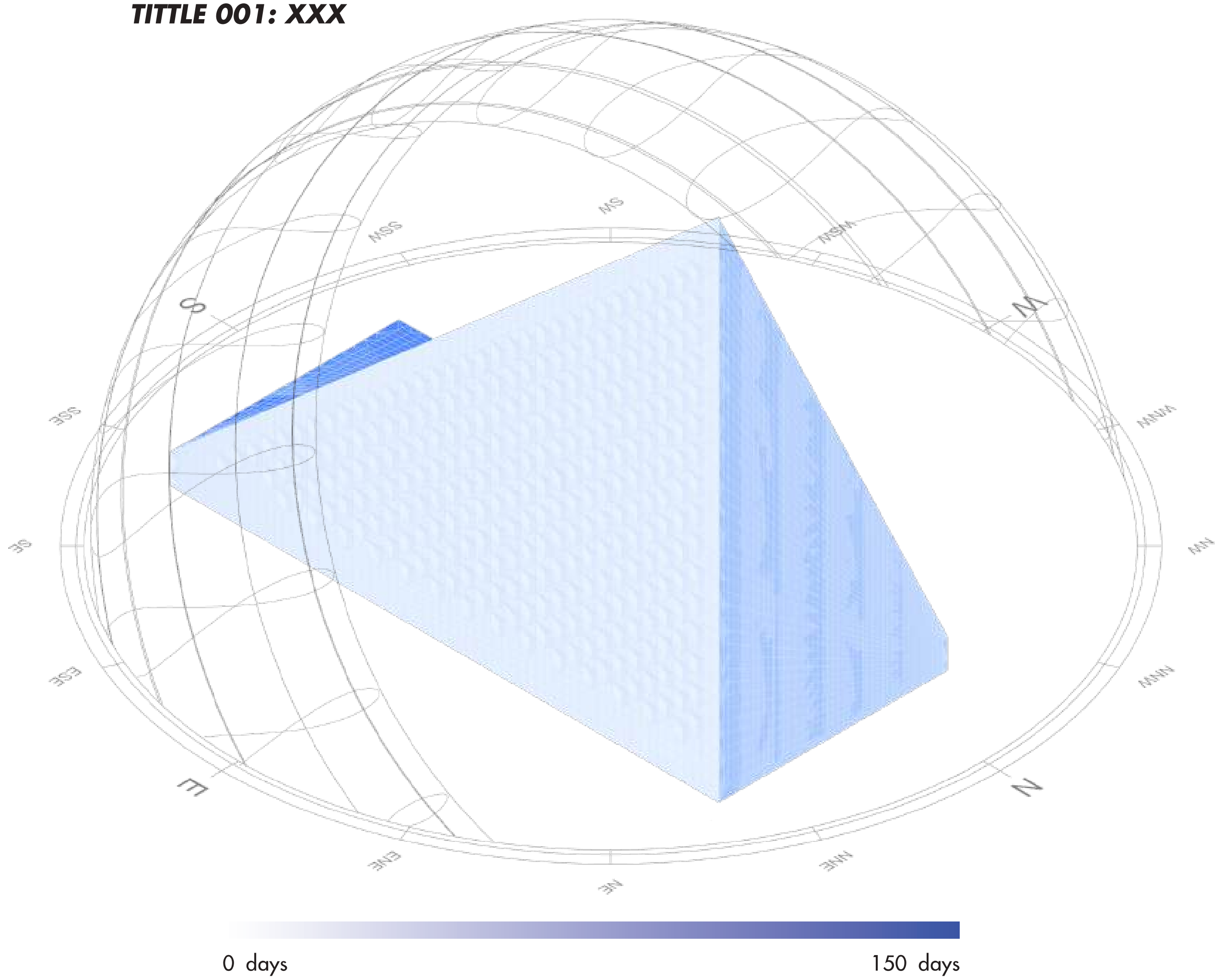
- Arvin Tang

VIA 57 WEST

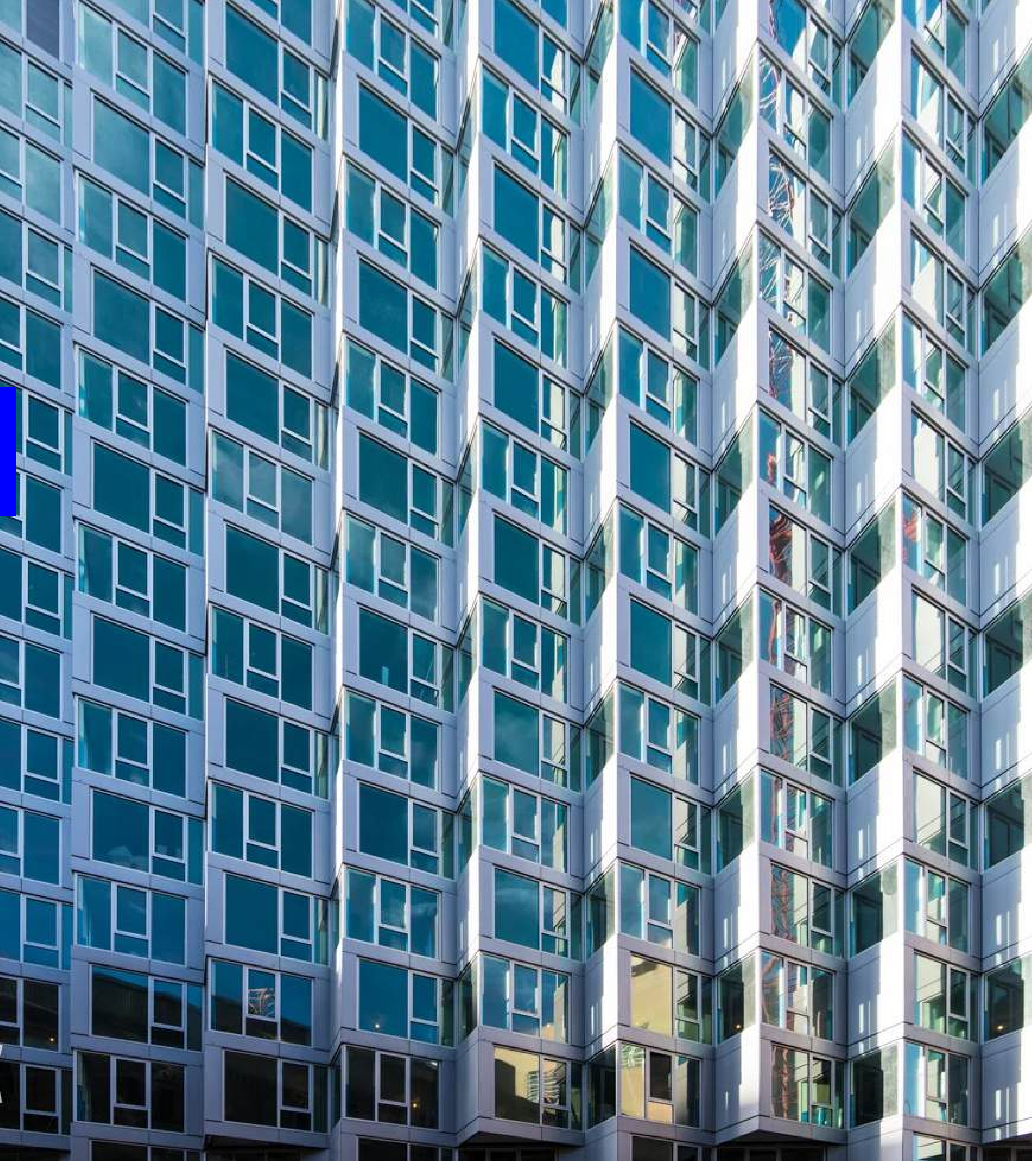
New york, United States
Architect: BIG

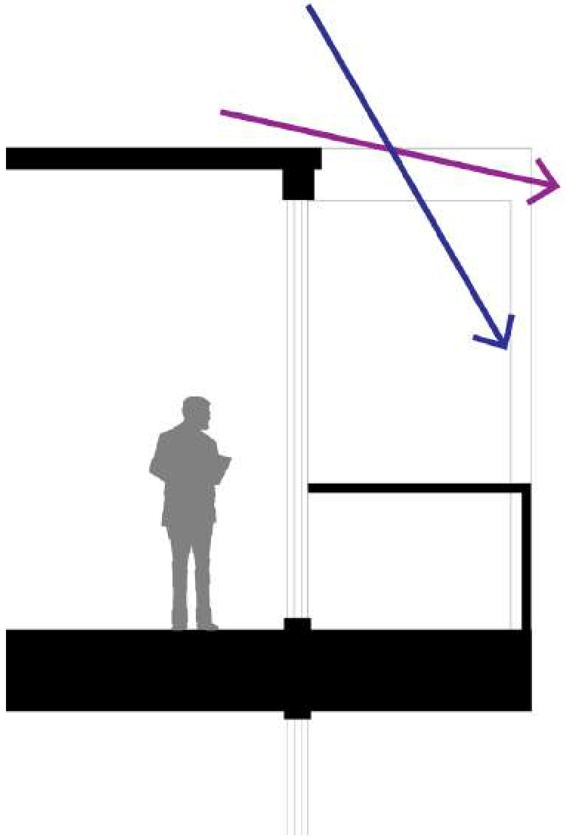
The VIA 57 West building in New York, designed by BIG, features a distinctive hybrid form that responds to its urban context and climate. On the north façade, the triangular slope frames views toward the Hudson River while minimizing direct sunlight. Its fishbone-patterned glazing balances daylight, insulation, and visual impact, creating a bold yet environmentally responsive urban face.

TITTLE 001: XXX

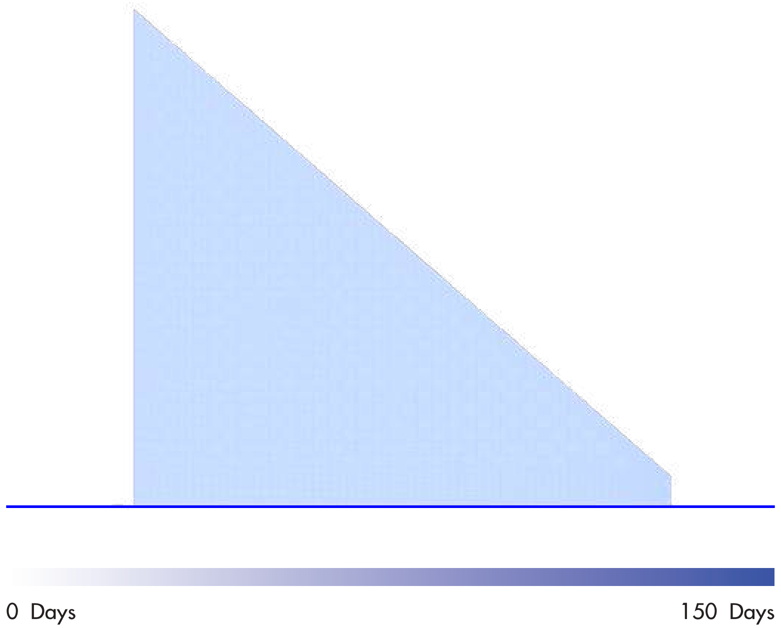


The triangular building's north façade receives very limited direct sunlight. Because the sun's trajectory stays mostly to the south, this surface remains shaded for nearly the entire year. Only during peak summer, when the sun reaches its highest altitude, does diffuse light briefly touch the façade, creating cooler, stable conditions and reducing thermal gain

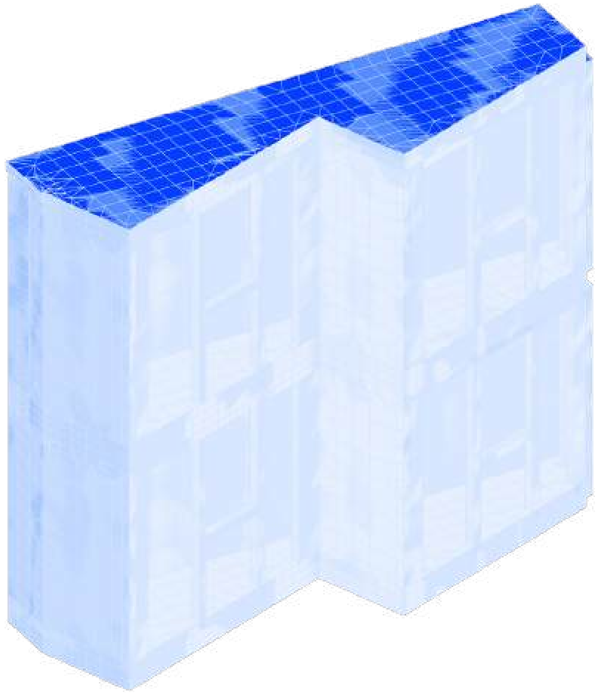




The glass façade is paired with a deep horizontal overhang that blocks high summer sun while allowing lower winter rays to enter. This passive shading strategy reduces overheating during summer and improves daylight penetration in winter. The structure uses the overhang as both a solar control device and an architectural frame that defines the building edge. It creates balanced light conditions inside, improving comfort without mechanical shading



This triangular north façade receives minimal direct sunlight, indicated by the pale blue shading. Its sloped geometry channels diffuse northern light evenly across the surface, stabilizing interior lighting through roughly 120–150 days annually. The fully glazed structure enhances brightness while minimizing solar gain, improving thermal comfort. Its clean planar surface also plays a role in reflecting ambient light deeper into interior spaces.

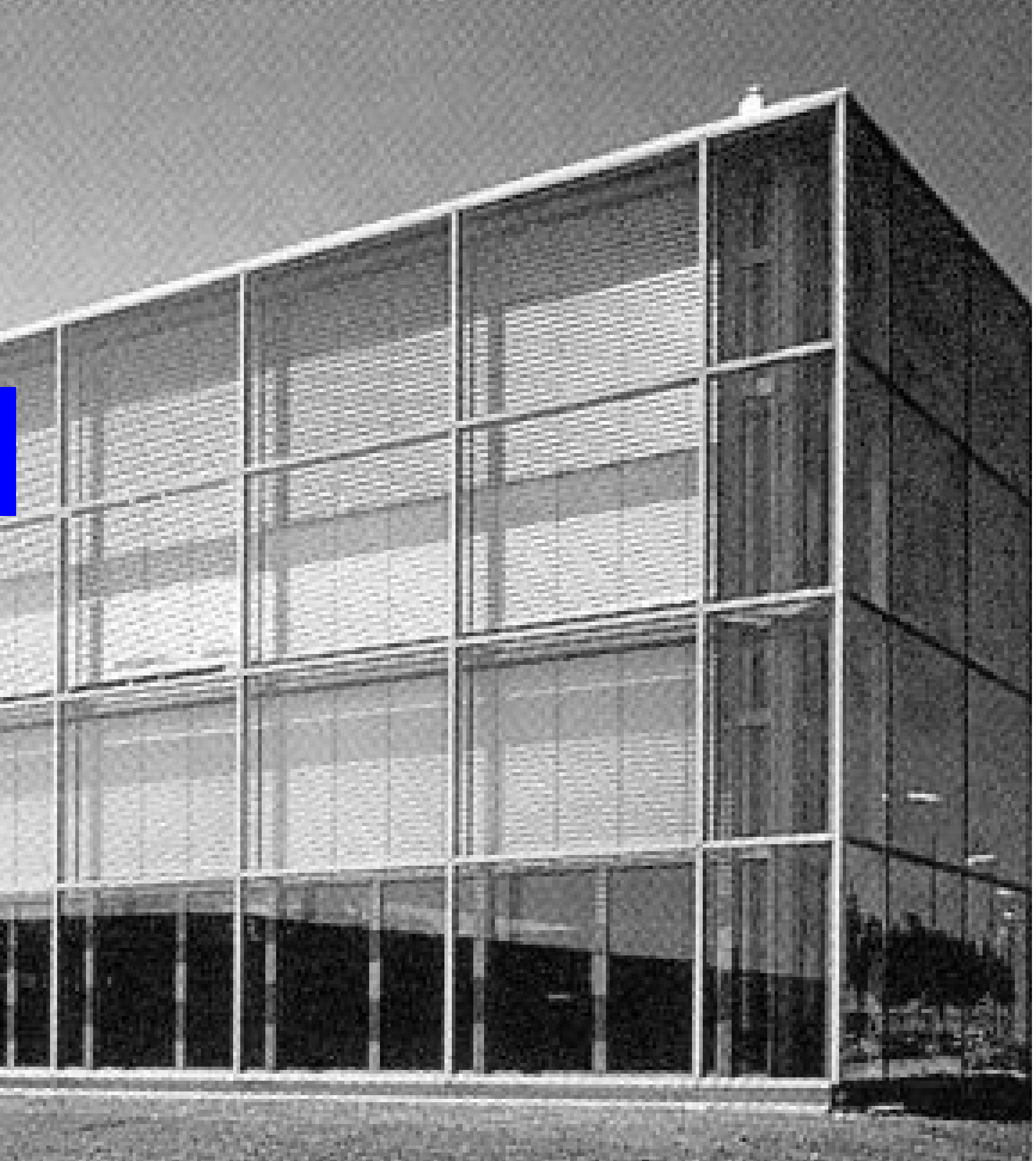


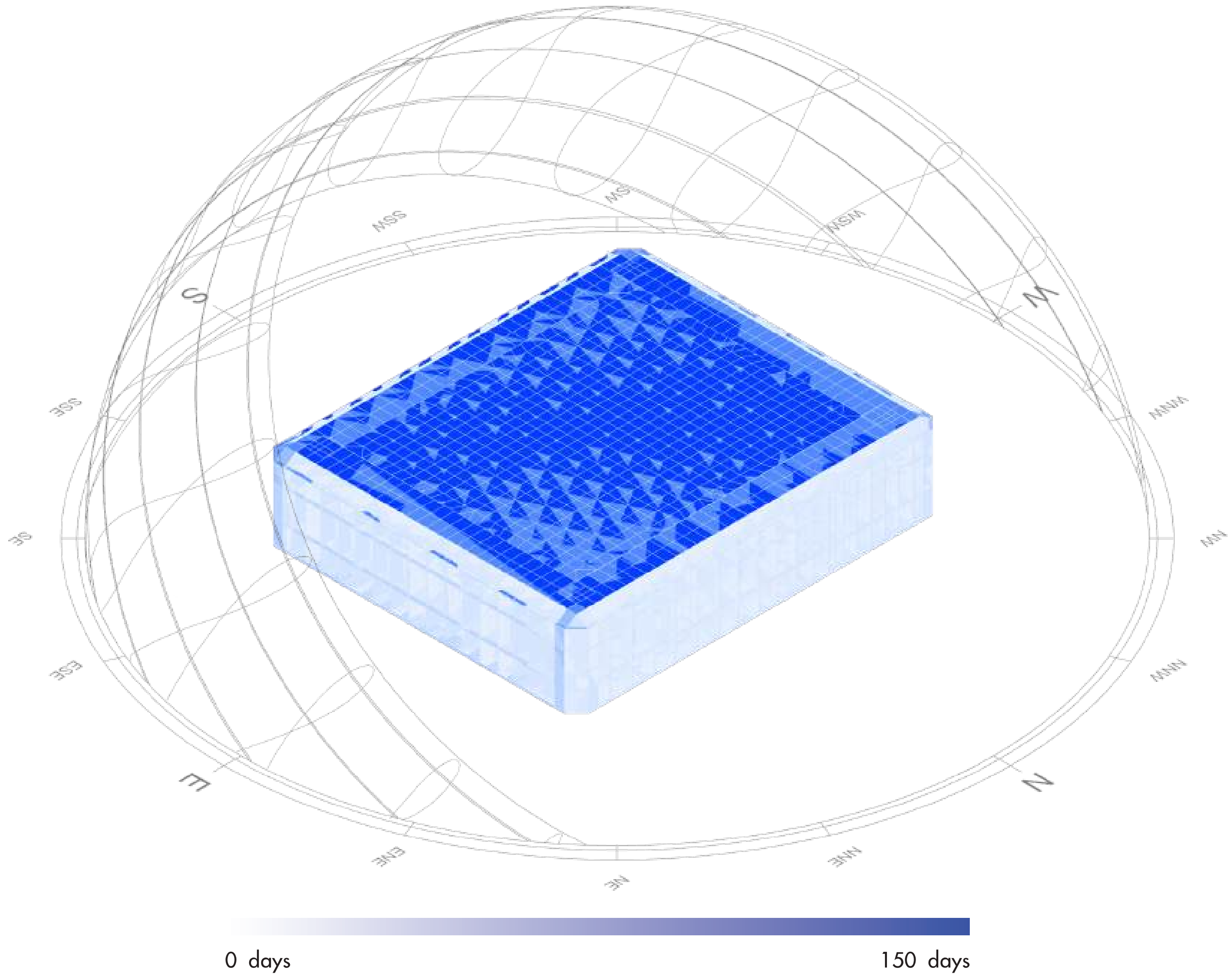
The zigzag façade is composed of angled glass panels that create alternating planes of reflection and light penetration. This geometry increases façade depth, enabling dynamic light modulation across the surface. Direct sunlight strikes the upper roof intensely, while angled sections diffuse and scatter daylight inward, improving illumination quality and reducing glare through passive geometric control

GÖTZ HEADQUARTERS

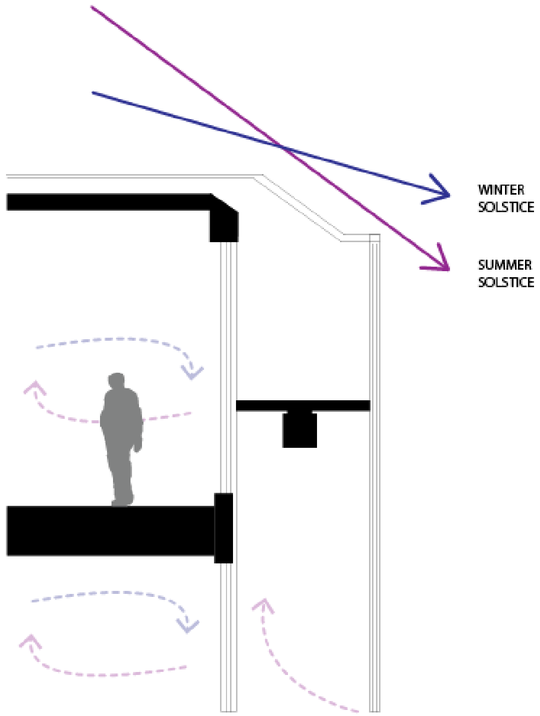
Würzburg, Germany
Architect: Webler + Geissler

The Götz Headquarters in Würzburg, designed by Webler + Geissler, combines functional clarity with environmental sensitivity. On the north façade, large glazed surfaces bring in diffuse daylight while avoiding overheating. The design emphasizes insulation and visual openness, creating bright interior spaces and a calm exterior expression that reflects the building's precise, modern architectural character.





For the flat-roofed block, sunlight primarily concentrates on the roof plane, while the north façade remains shaded for most of the year. The sun paths arc southward, resulting in very few sunlight hours on the vertical north surface. This configuration maximizes solar gain on the roof while maintaining a thermally consistent, shaded façade below.



This section integrates a glass façade with a ventilated cavity. Solar angles guide light deep into the interior in winter, while in summer the extended façade deflects direct rays. The cavity enables warm air to rise and escape, pulling cooler air in from below—enhancing passive ventilation. The structure acts as both environmental buffer and shading layer, optimizing daylight and airflow for seasonal adaptation.

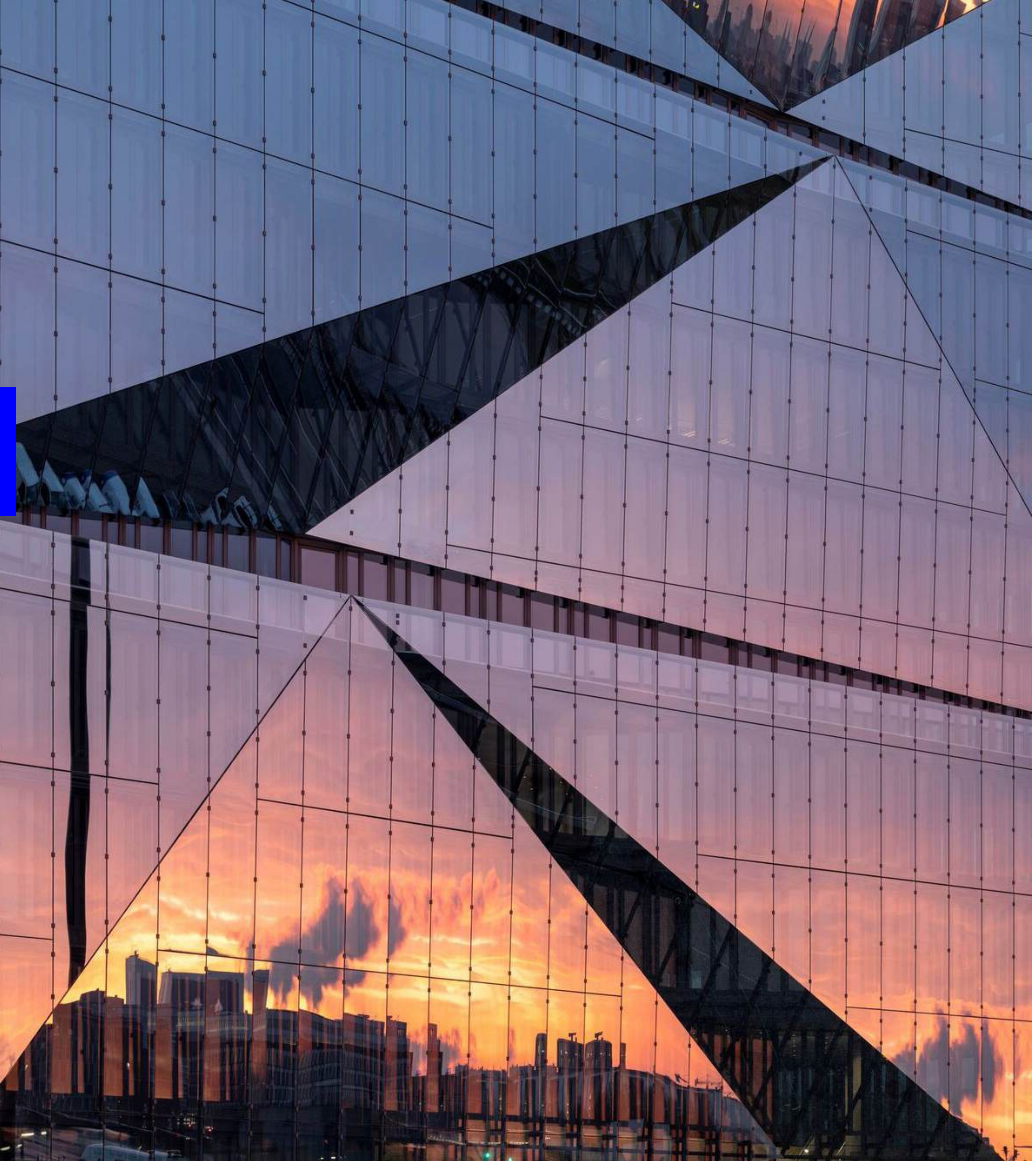
This long horizontal north façade experiences uniform diffuse lighting throughout the year, with very low direct solar exposure. The extended glazing surface collects soft light consistently across approximately 100–140 days, supporting energy-efficient interior illumination. The simple planar glass structure minimizes heat gain, while the façade's length emphasizes even daylight distribution and a balanced relationship between transparency and environmental control.

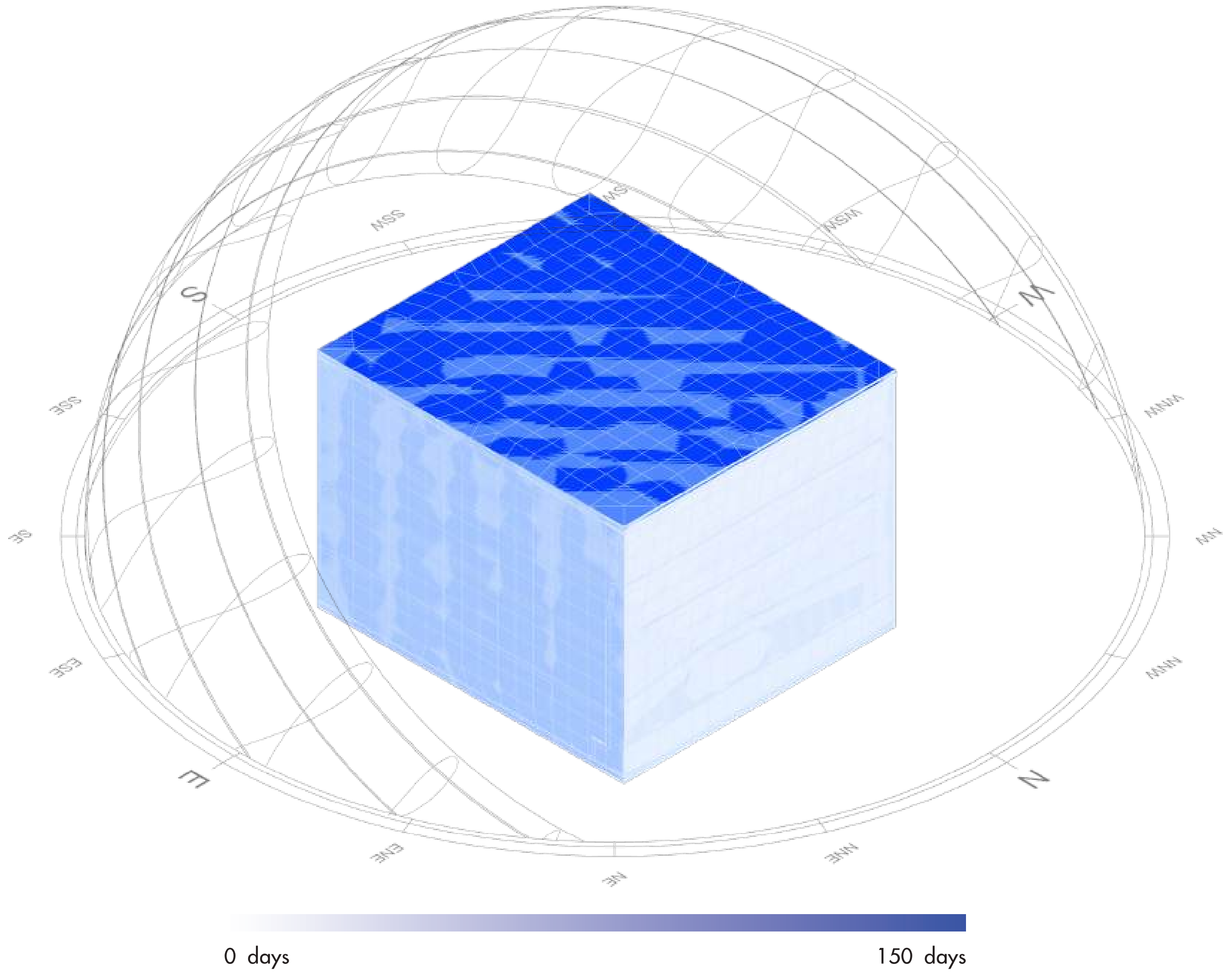
This structure features stacked glass panels with deep horizontal slabs that act as overhangs. The stepped section allows sunlight to reach different levels unevenly, with the roof planes receiving the strongest exposure. Lower interior spaces benefit from softened, indirect light. This configuration enhances solar shading, daylight distribution, and passive thermal regulation throughout the building.

CUBE BERLIN

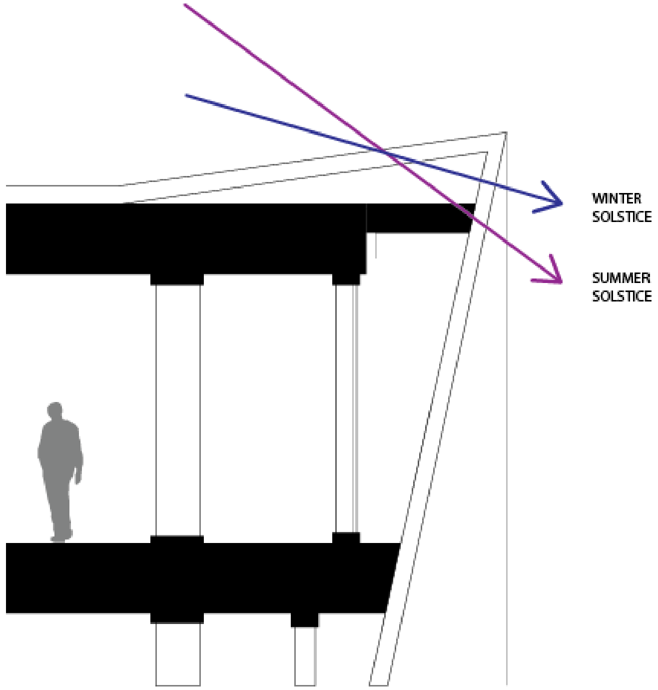
Berlin, Germany
Architect: 3XN studio

The Cube Berlin is a contemporary office building emphasizing transparency, performance, and urban identity. On the north façade, a sleek glass curtain wall brings in soft, even daylight while minimizing solar gain. Its precise geometric detailing and high-performance glazing enhance energy efficiency, support interior comfort, and create a refined, crystalline architectural presence along the Spree River.

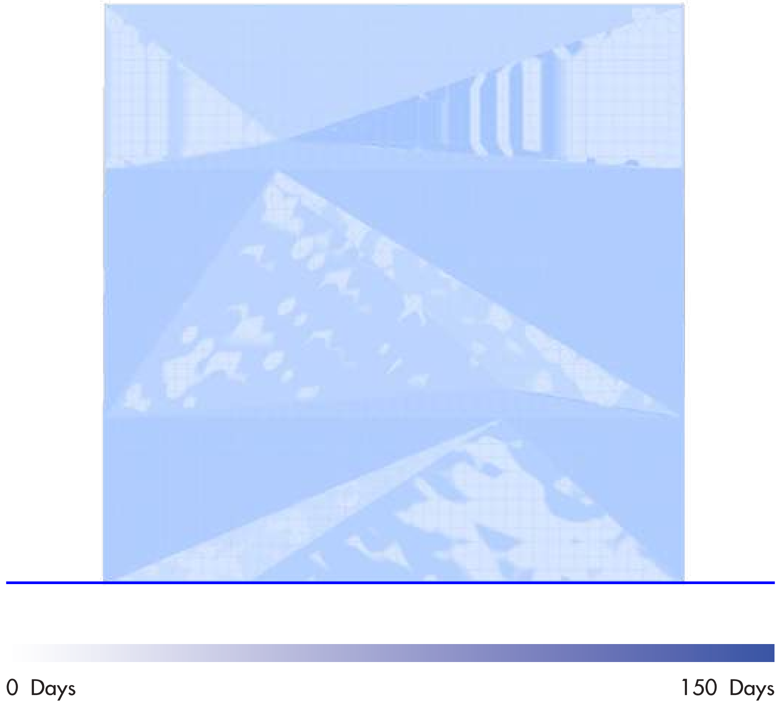




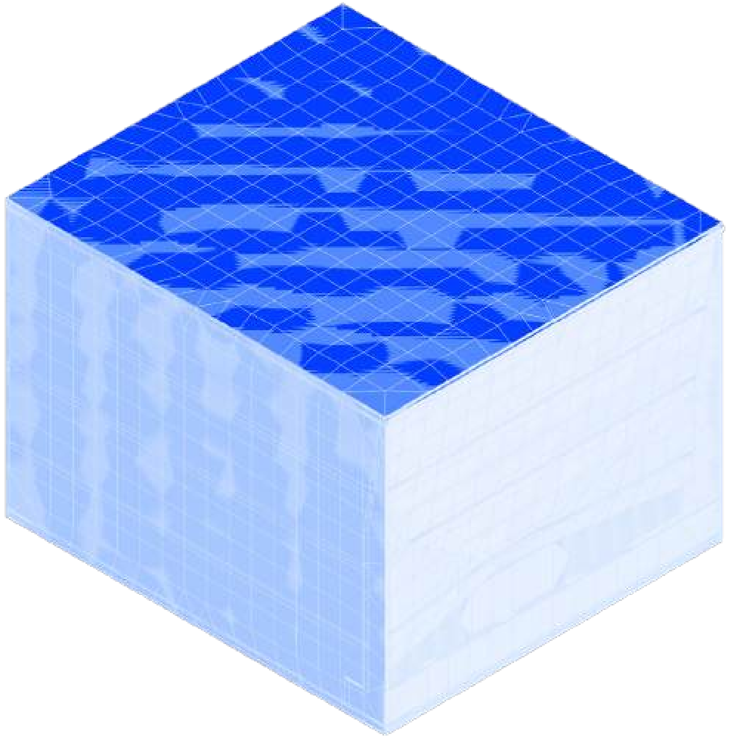
The cubic building illustrates clear solar distribution differences: its roof receives the majority of solar exposure, while the north façade experiences nearly zero days of direct sunlight annually. The sun's seasonal paths trace consistently toward the south, leaving this vertical surface in shade. This orientation provides excellent thermal stability and controlled natural lighting, making the north façade an important environmental regulator within the building's overall passive design strategy.



A tilted glass façade supported by columns creates an angular shading geometry. The extended façade shields the interior from high summer sun while allowing lower winter sun angles to penetrate. Structurally, the façade acts as both enclosure and shading device, with the tilt increasing solar protection efficiency. The space between structure and glass improves thermal performance and frames views outward.



This folded glazed north façade combines triangular geometries to catch and scatter diffuse sunlight. Over roughly 130–150 sunlight days, the angled planes create varied lighting effects while avoiding harsh direct rays. The structural system integrates glass and framing in a way that maximizes reflection and depth, enhancing both thermal stability and interior daylight quality without excessive solar gain.

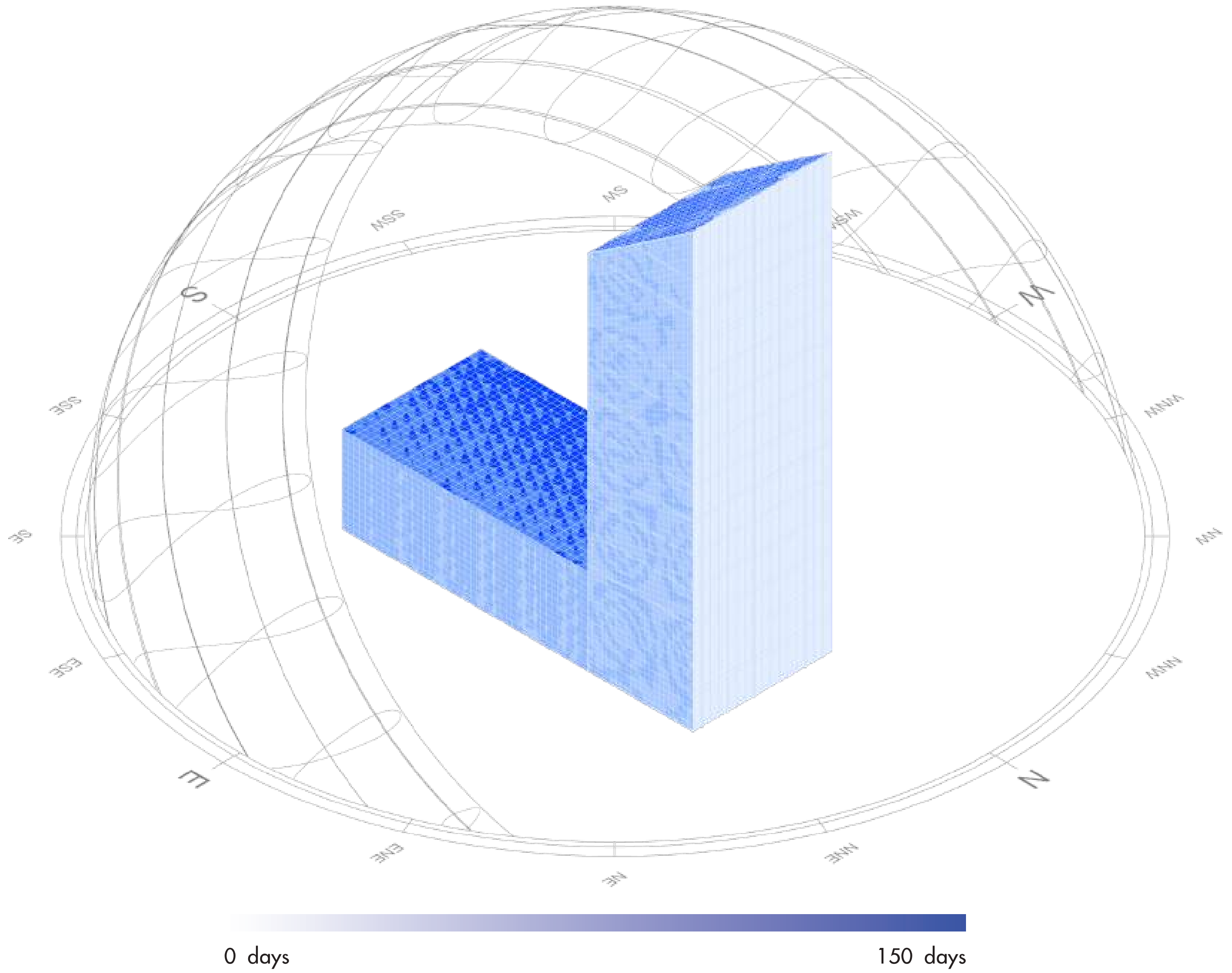


The cubic form employs a continuous glass curtain wall paired with a large flat glass roof. The roof surface captures maximum solar radiation, while vertical façades receive diffuse sunlight. This clear geometry emphasizes solar exposure contrast between horizontal and vertical planes, supporting natural illumination and enabling strategic shading or photovoltaic integration for energy use.

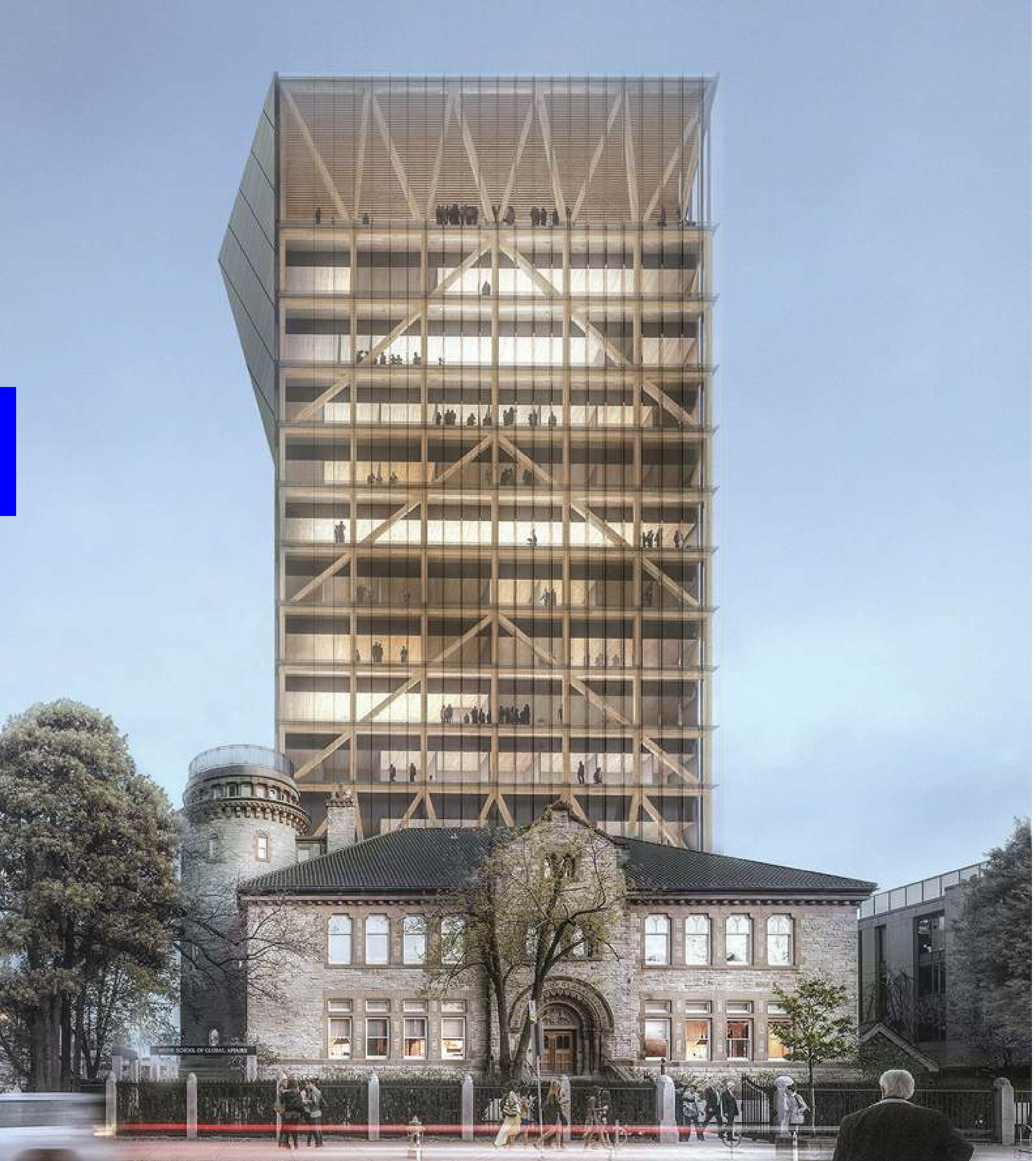
UT ACADEMIC WOOD TOWER

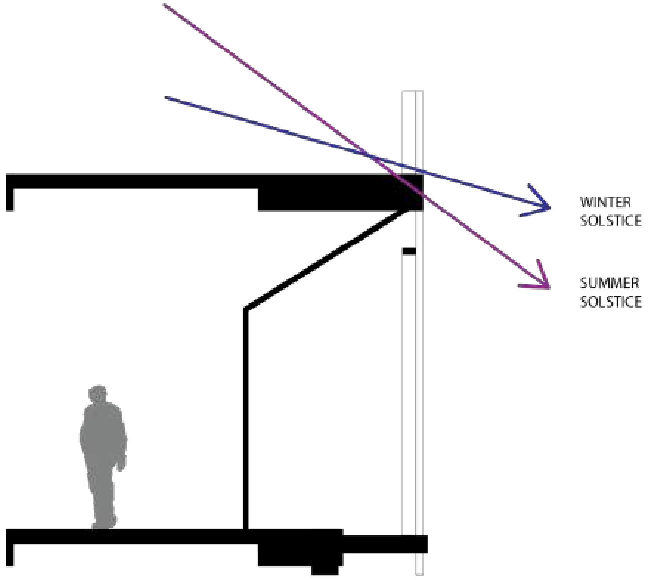
Toronto, Canada
Architect: Patkau studiox

The UT Academic Wood Tower in Toronto showcases sustainable timber construction with façades designed for energy performance and urban presence. On the north façade, vertical wooden elements and carefully placed glazing manage diffuse light while maintaining strong insulation. This approach minimizes heat loss, enhances interior comfort, and highlights the building's warm, natural material expression in the cityscape

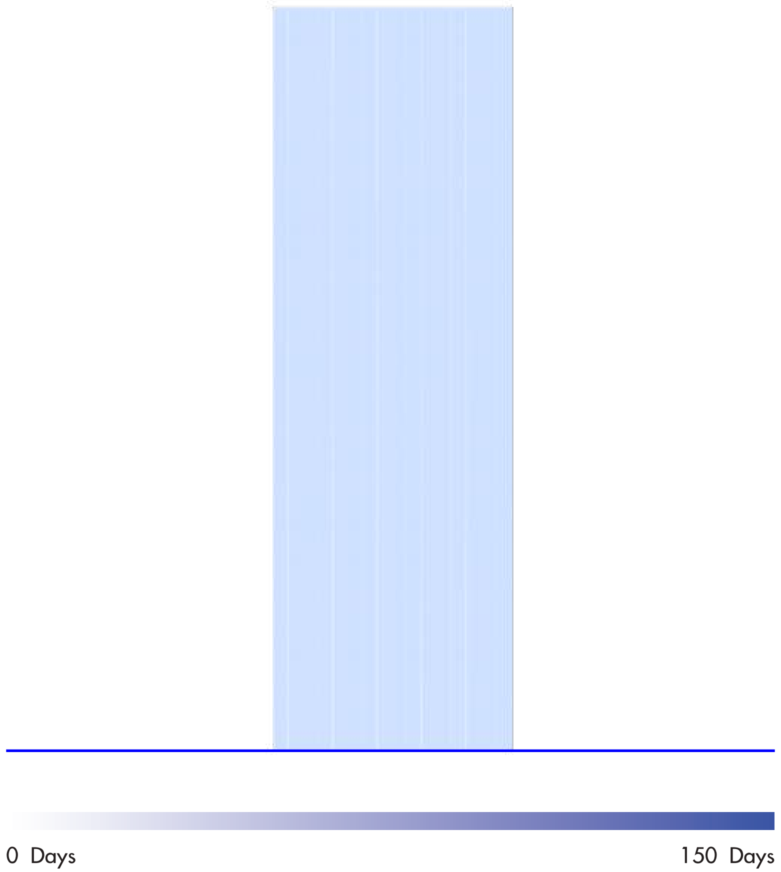


In the L-shaped building, the taller vertical block shades the lower volumes, intensifying the north façade's limited exposure. Because the sun's paths arc southward through all seasons, these façades remain in shadow for almost the entire year, with very few days of diffuse light. This arrangement stabilizes internal temperatures, minimizes overheating and glare, and creates soft, indirect lighting—characteristics that are ideal for workspaces and galleries requiring steady environmental control.

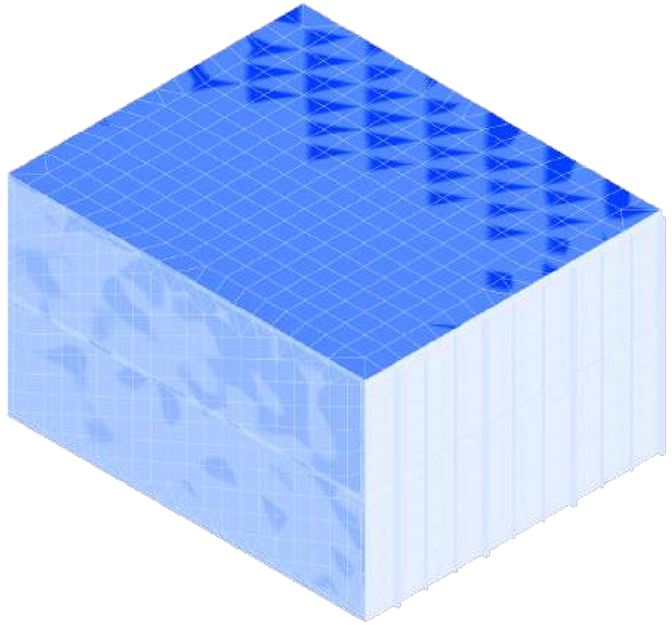




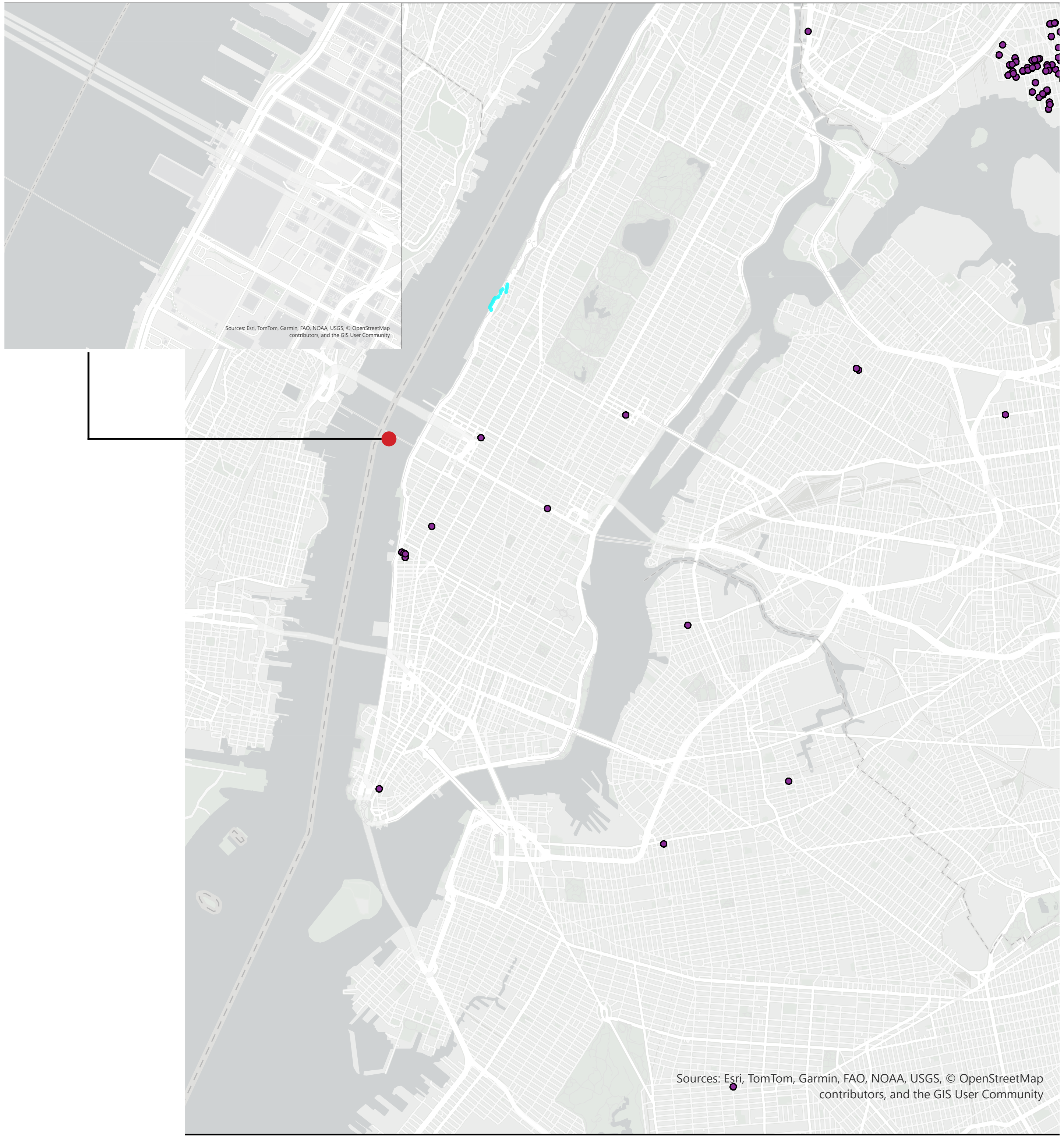
This section uses a folded shading element aligned with the glass façade. The fold deflects summer rays while directing lower winter sun deeper inside. Structurally, the angled element works as both shading device and support frame, creating a controlled light buffer zone. It enhances daylight quality, reduces glare, and maintains transparency while adapting seasonally to solar angles



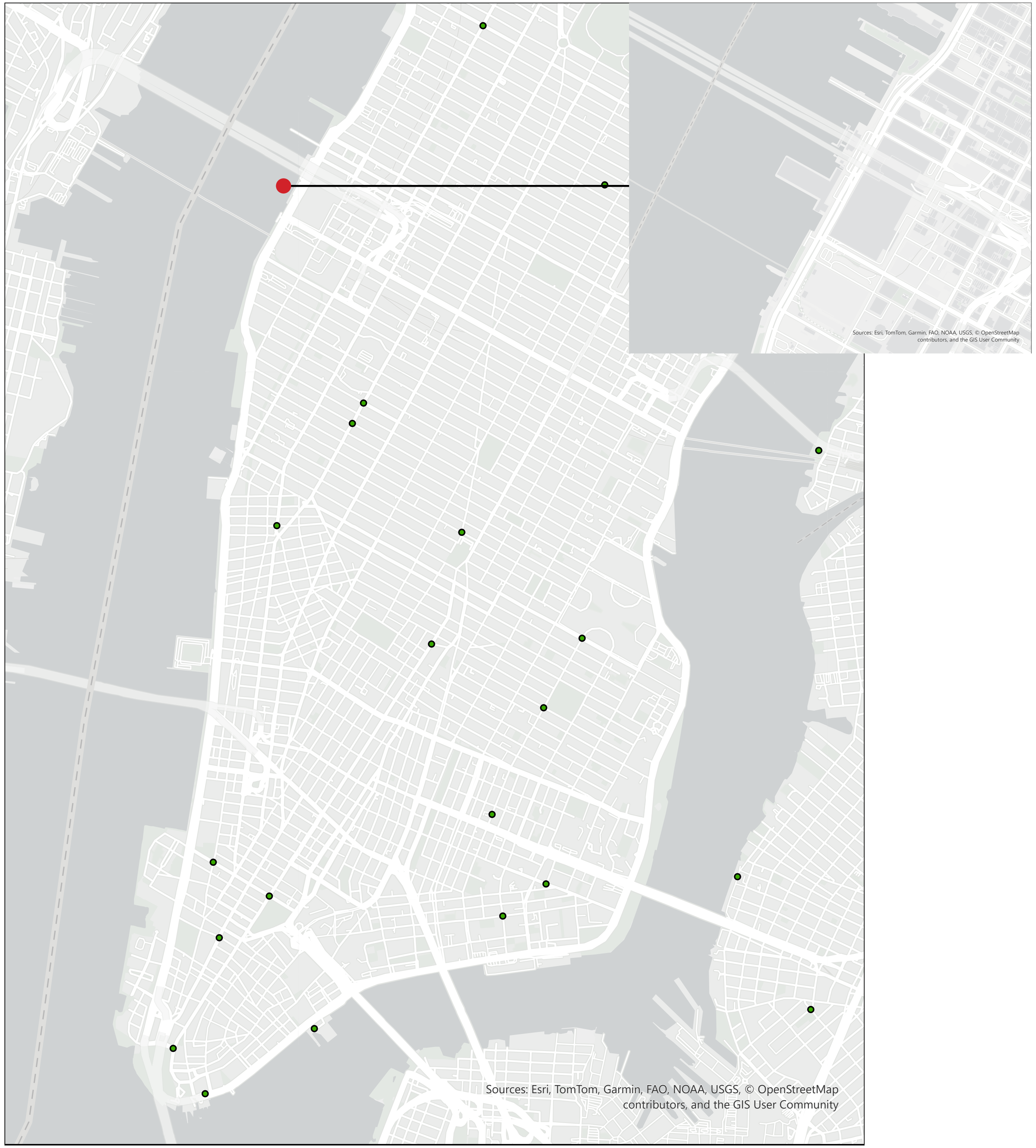
The tall vertical north façade acts as a uniform light filter, receiving mostly diffuse sunlight throughout the year. Over about 110–140 days, the consistent exposure brightens interior spaces gently without overheating. The structural clarity of the glass wall emphasizes transparency and verticality, while the glazing system helps maintain steady lighting and insulation performance across the entire elevation.



This building uses a simple rectangular glass wall structure with flat roof planes. The horizontal surfaces are fully exposed, gathering sunlight for long durations, while vertical façades rely on scattered daylight. The minimalist form demonstrates how planar glass walls manage solar gain differently by orientation, informing daylighting strategies and thermal performance optimization over time

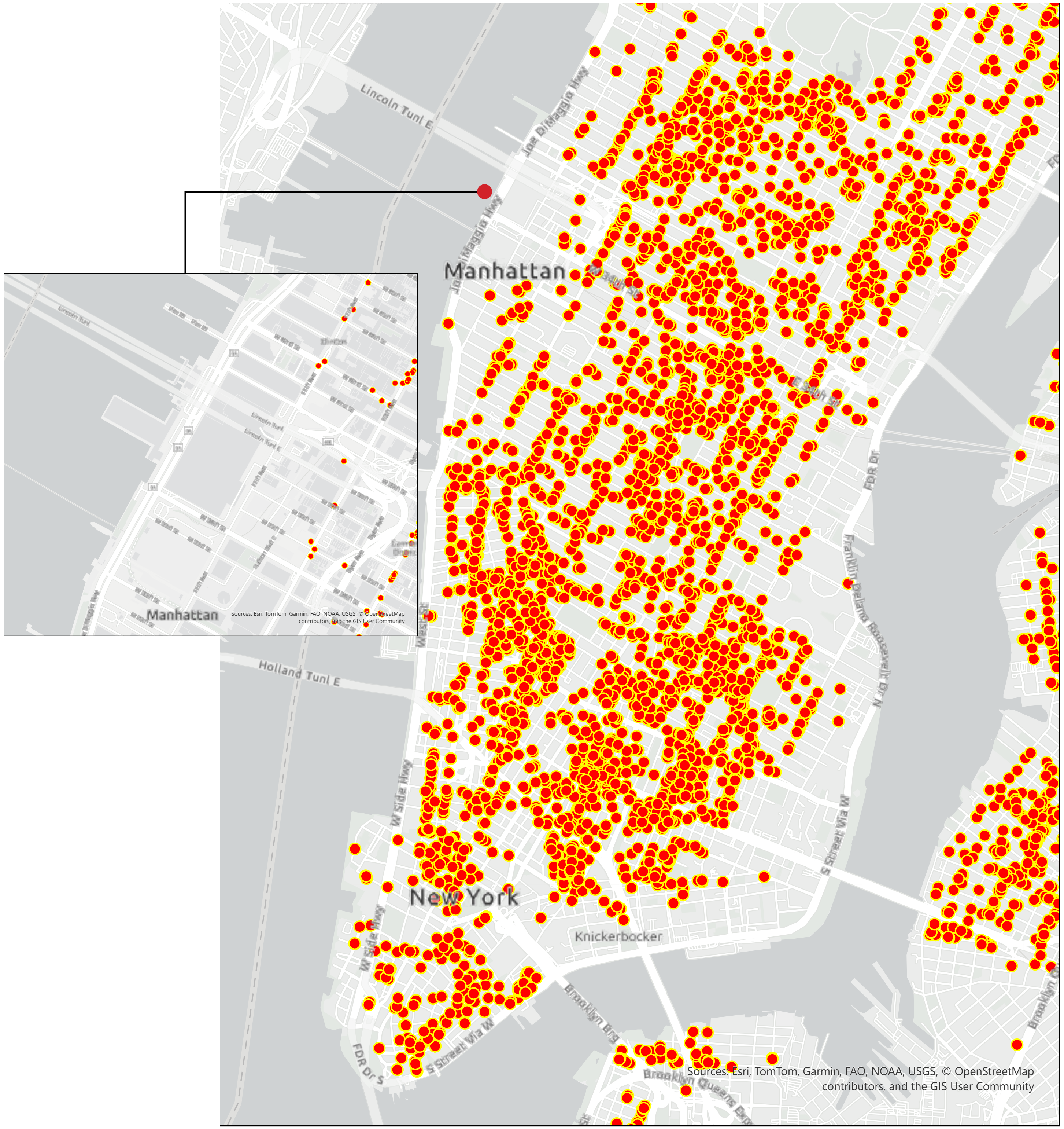


Wholesale_Markets_20251105_Layer



Legend

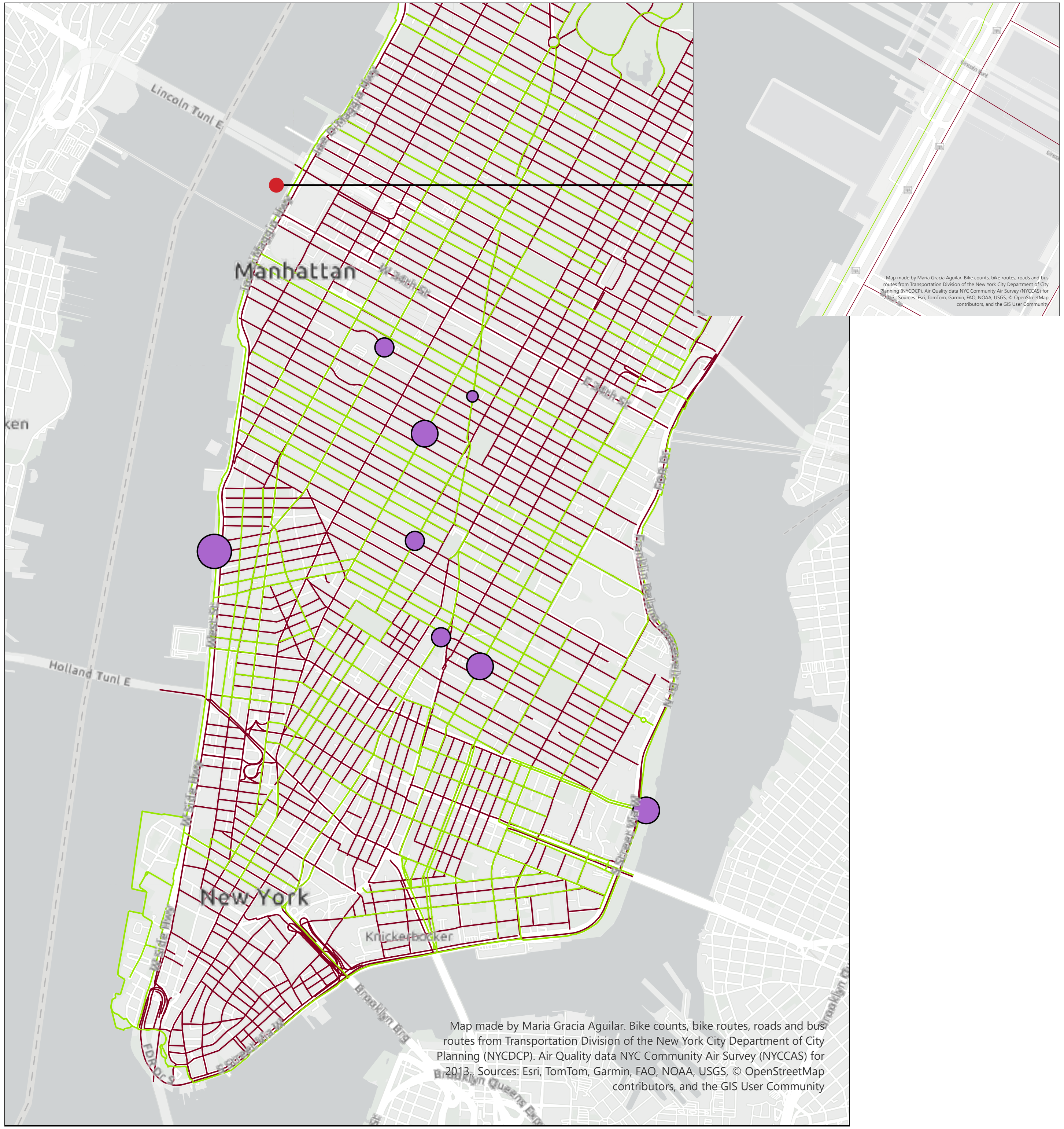
Greenmarket



Legend

NYC Open Restaurants Application (JS)

Survey Data Locations



Legend

Bike Count (2015)
TotalUsers

1,433 - 2,371

2,372 - 3,379

> 3,379

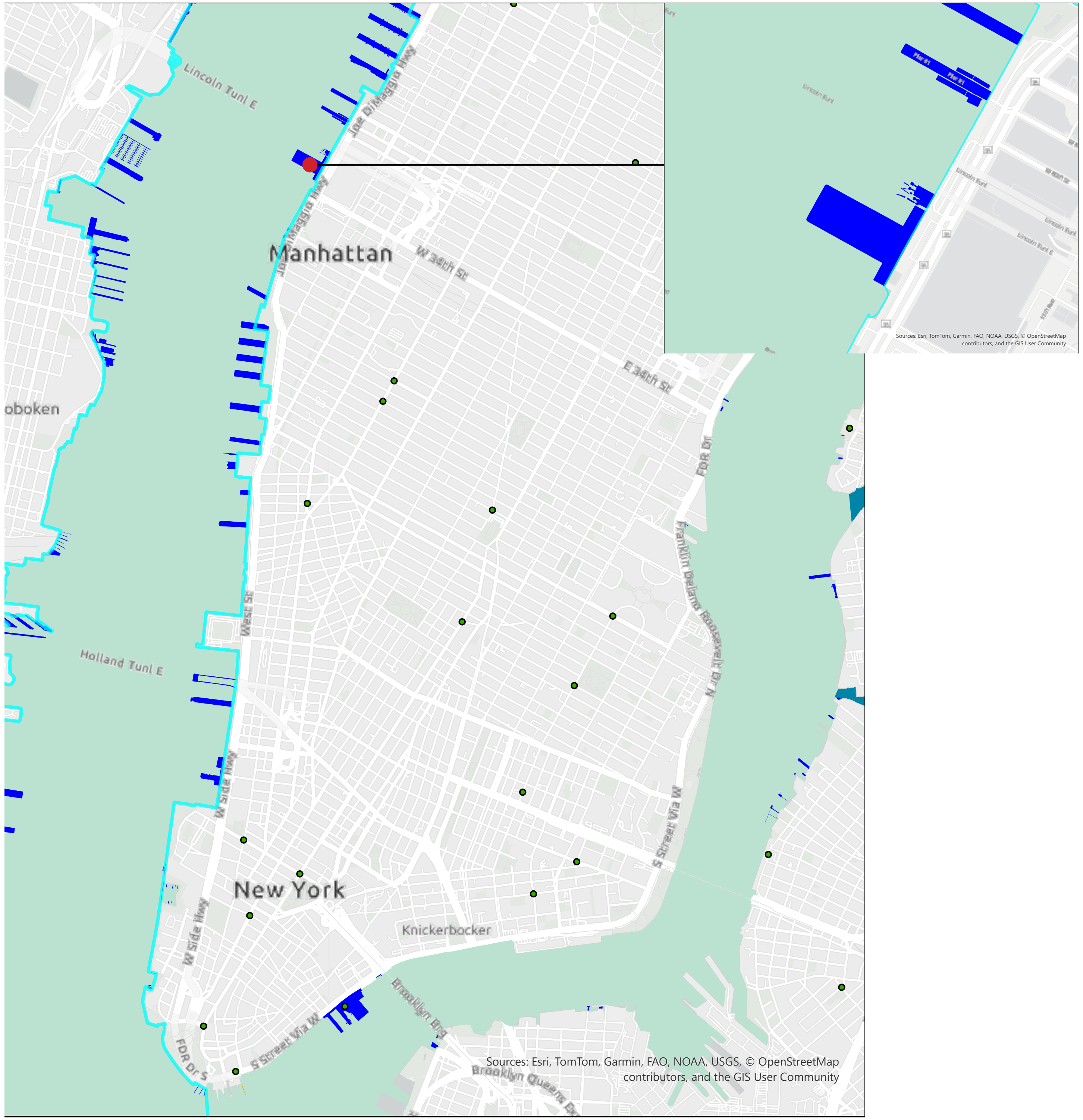
Bike Routes

Bus Routes (2017)

Roads

Legend

Truck Routes



Legend

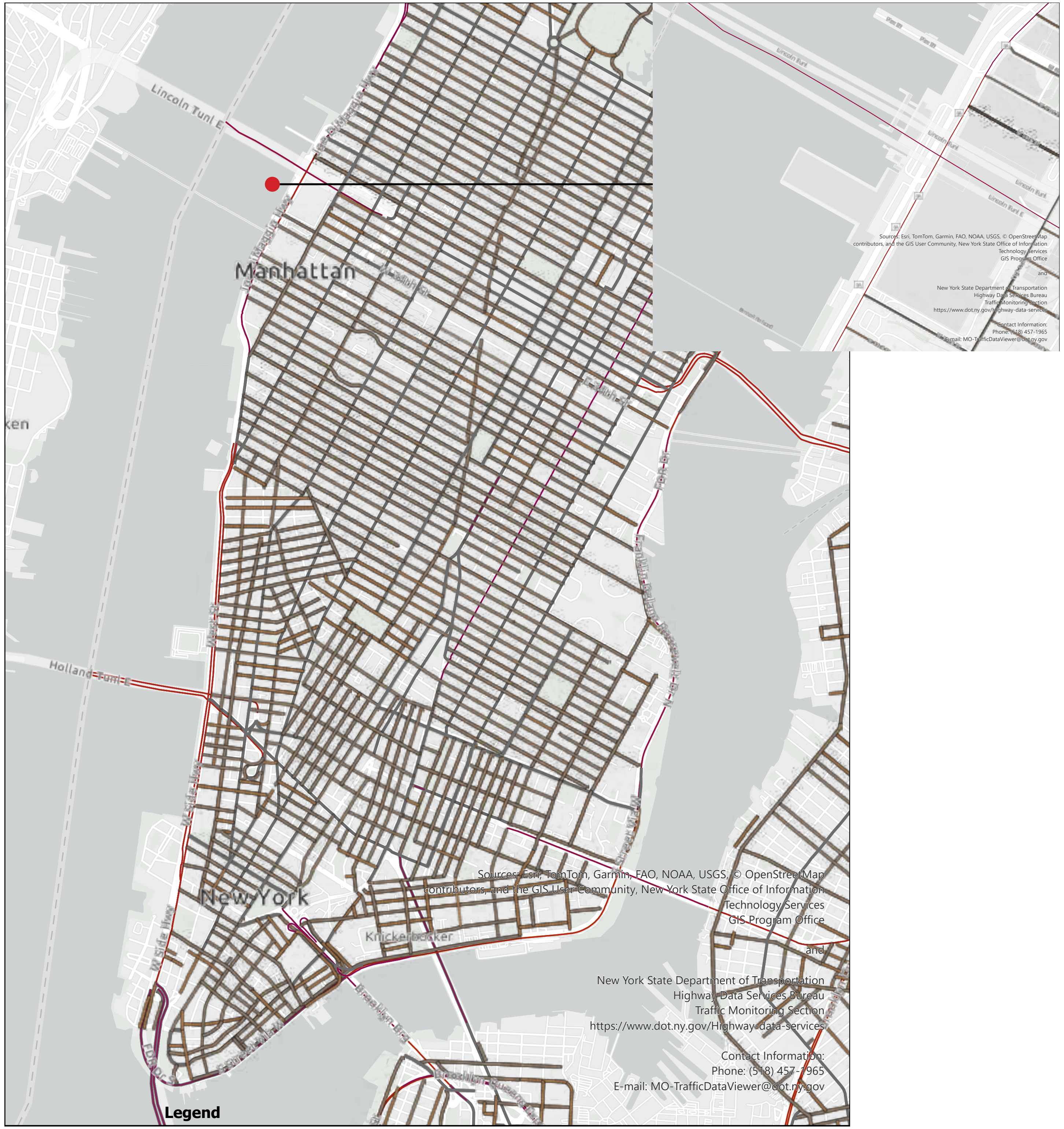
Greenmarket
Parks Bike Paths

Hydro Structures
- JETTIE
- PIER
- SEAWALL
- <all other values>

Hydro Region
- 2610 - Pond
- 2620 - River
- 2640 - Wetland
- 2660 - Bay/Ocean
- 2600 - Lake
- 650 - Beach/Shoreline
- 2630 - Stream wider than 8 feet
- <all other values>

Legend

High Resolution Waterbodies



Legend

Annual Average Daily Traffic

AADT

≤10696.000000

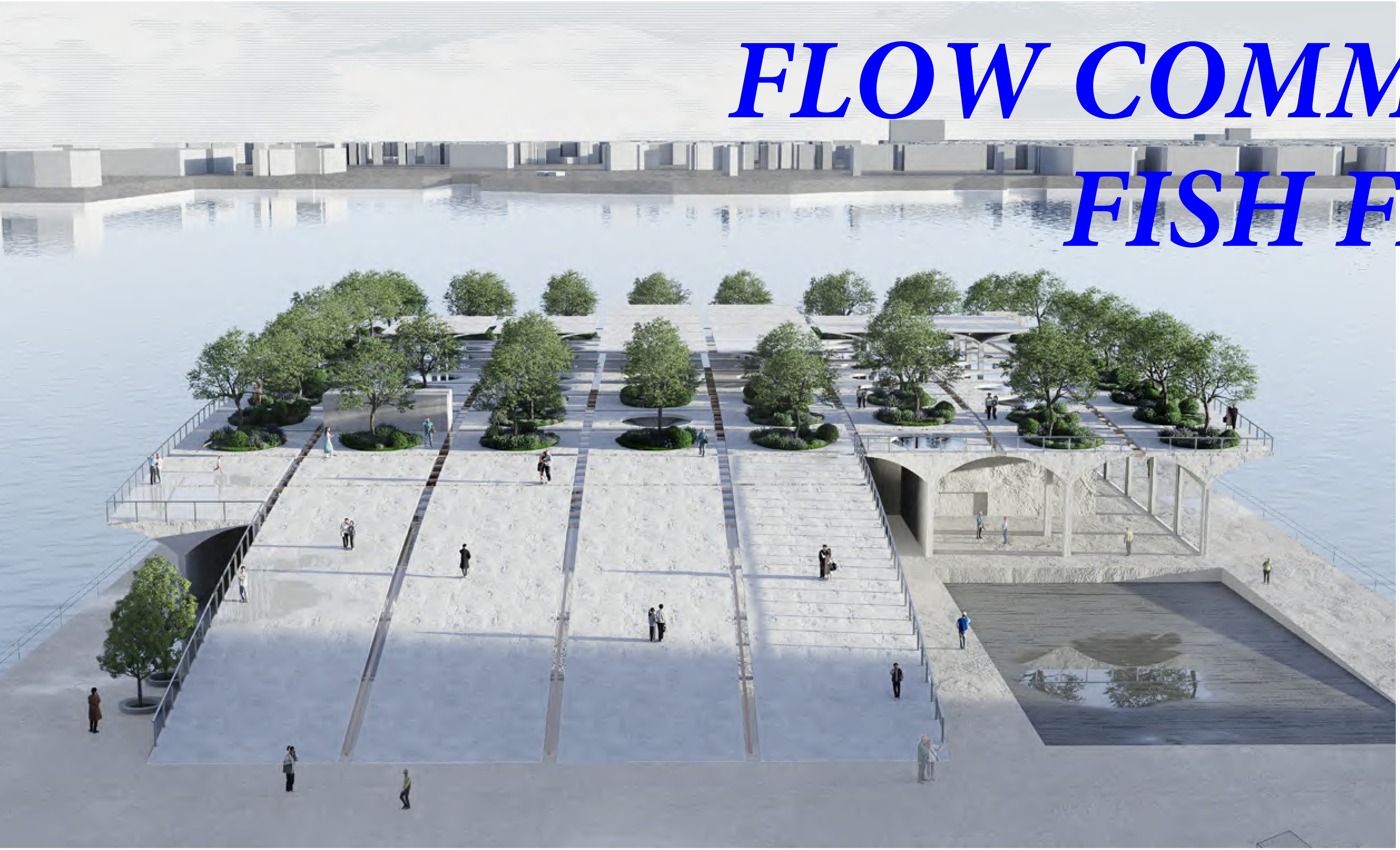
≤32751.000000

≤66562.000000

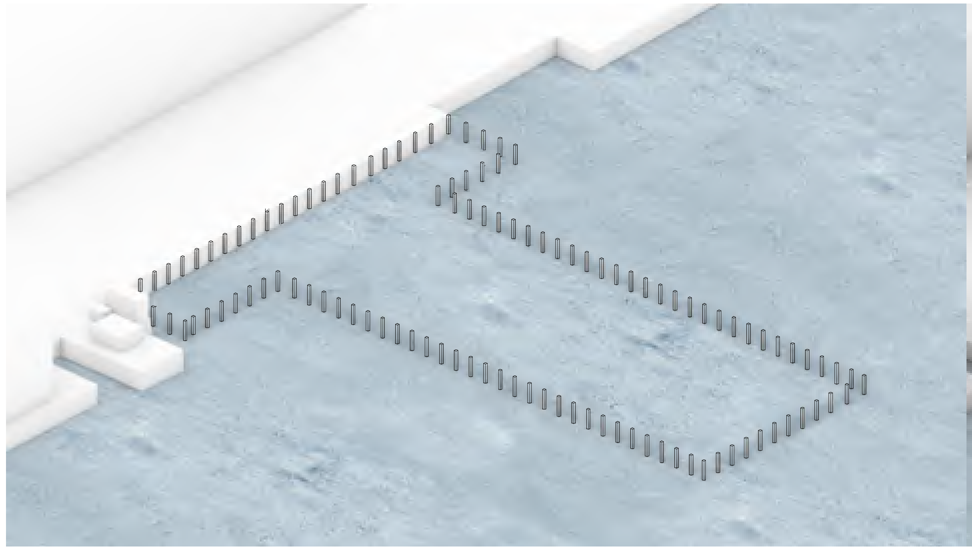
≤118661.000000

≤285440.000000

FLOW COMMONS FISH FARM

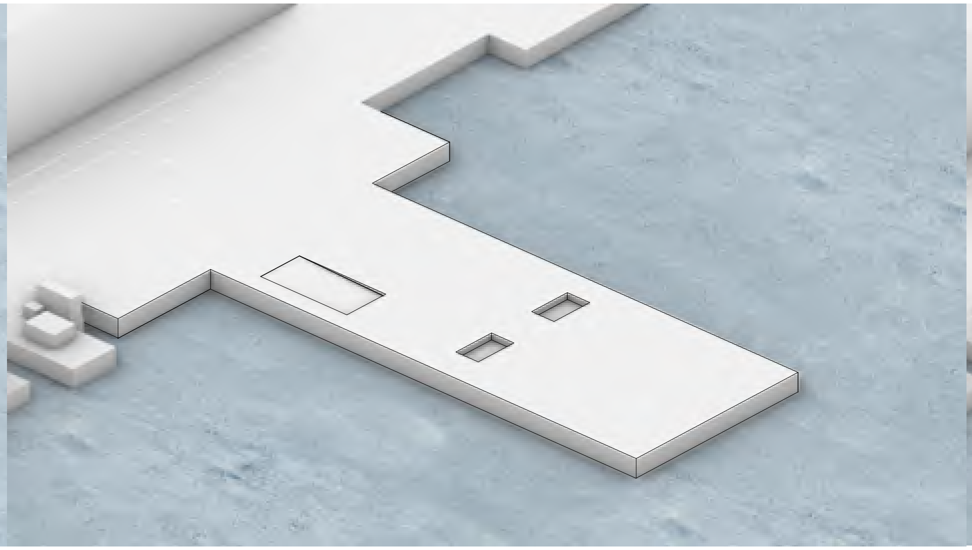


This Pier 76 fish-farming complex blends public space with aquatic production. A sloping rooftop landscape creates an open park where visitors walk among tree-lined islands overlooking the Hudson River. Beneath, vaulted spaces house a fish factory connected directly to the river for filtration and breeding. The design merges ecology, industry, and recreation into one urban waterfront infrastructure.



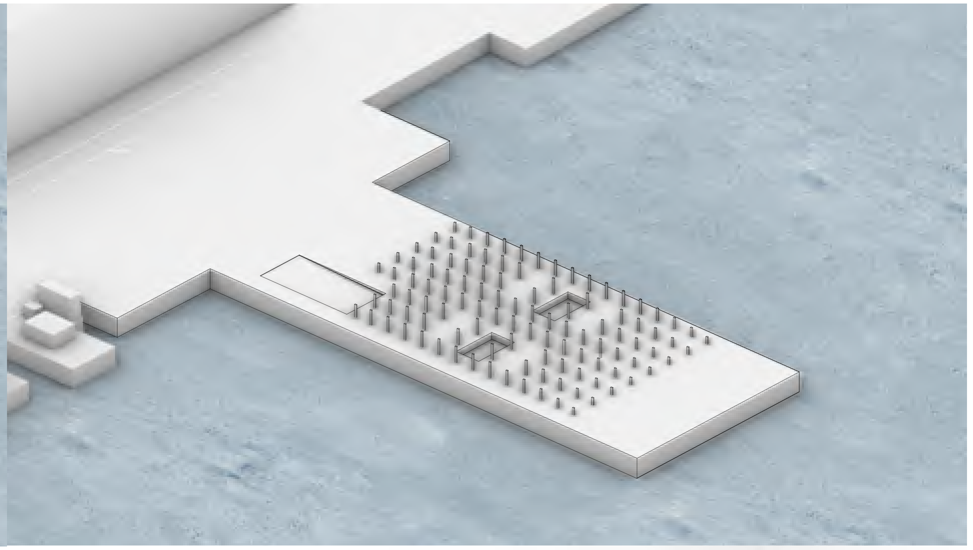
Original Column Grid

Shows the existing column layout of Pier 76, forming the structural basis of the project.



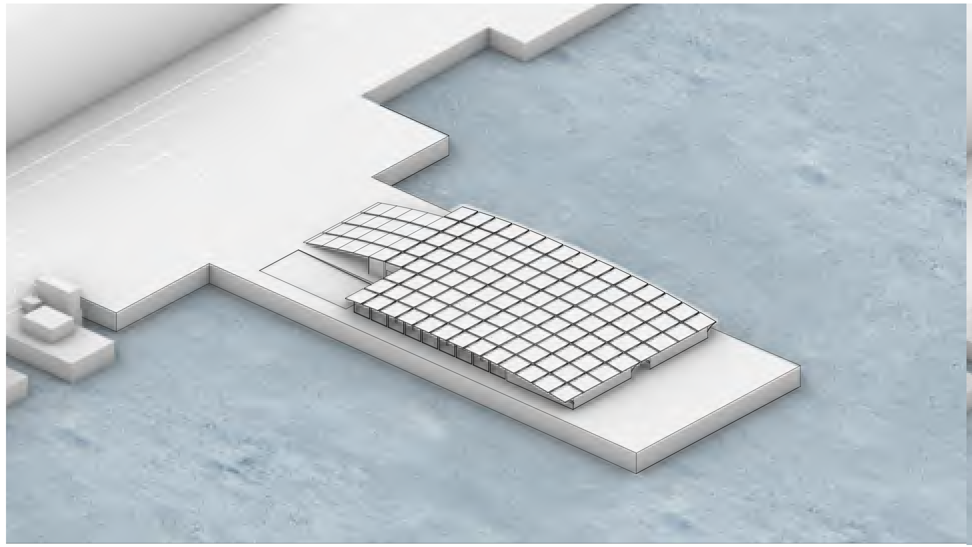
Modified Site: Loading Dock + Filter Zone

Redefines the site by adding a loading dock and filtration area to support fish-farm operations.



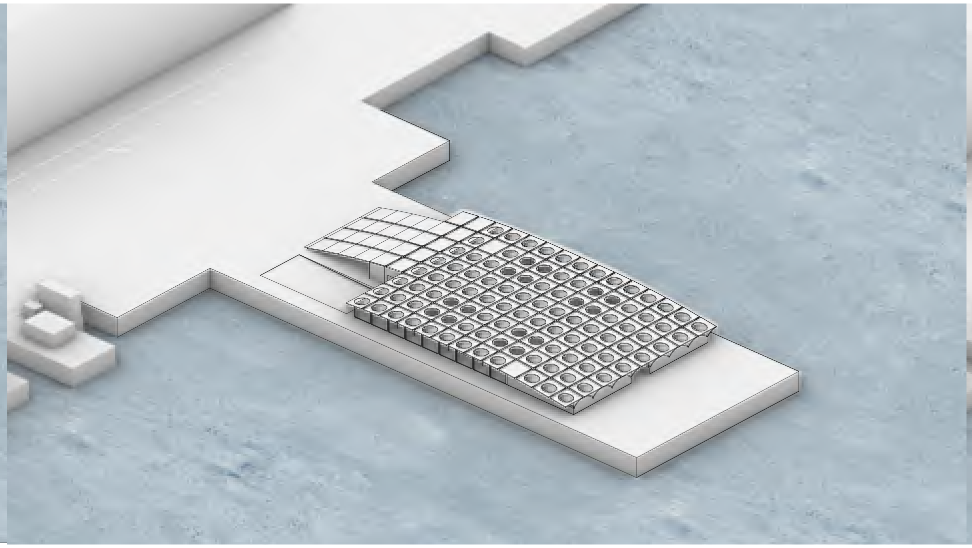
New Column System

Introduces new functions and establishes a revised column grid to support the building.



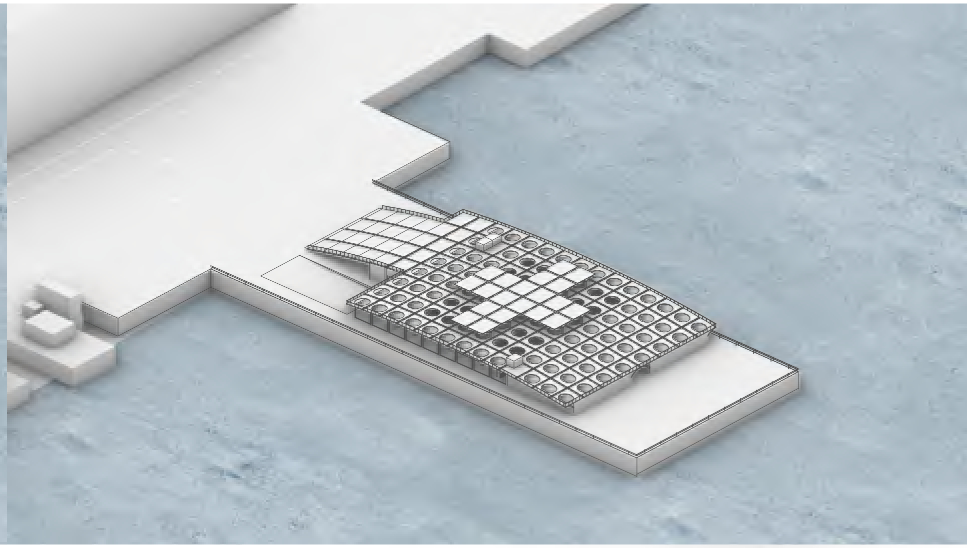
Initial Building Skin

Generates a sloped surface over the columns, forming the first layer of the public roof.



Modular System Development

Applies a modular grid that organizes openings, tanks, and structural bays.public roof.



Final Building Form

Integrates structure, skin, and program into a complete fish-farm facility with a public rooftop landscape.public roof.

ROOF

Soil under the roof floor and planting trees on the roof. Some circle material is glass.

CONNECTION

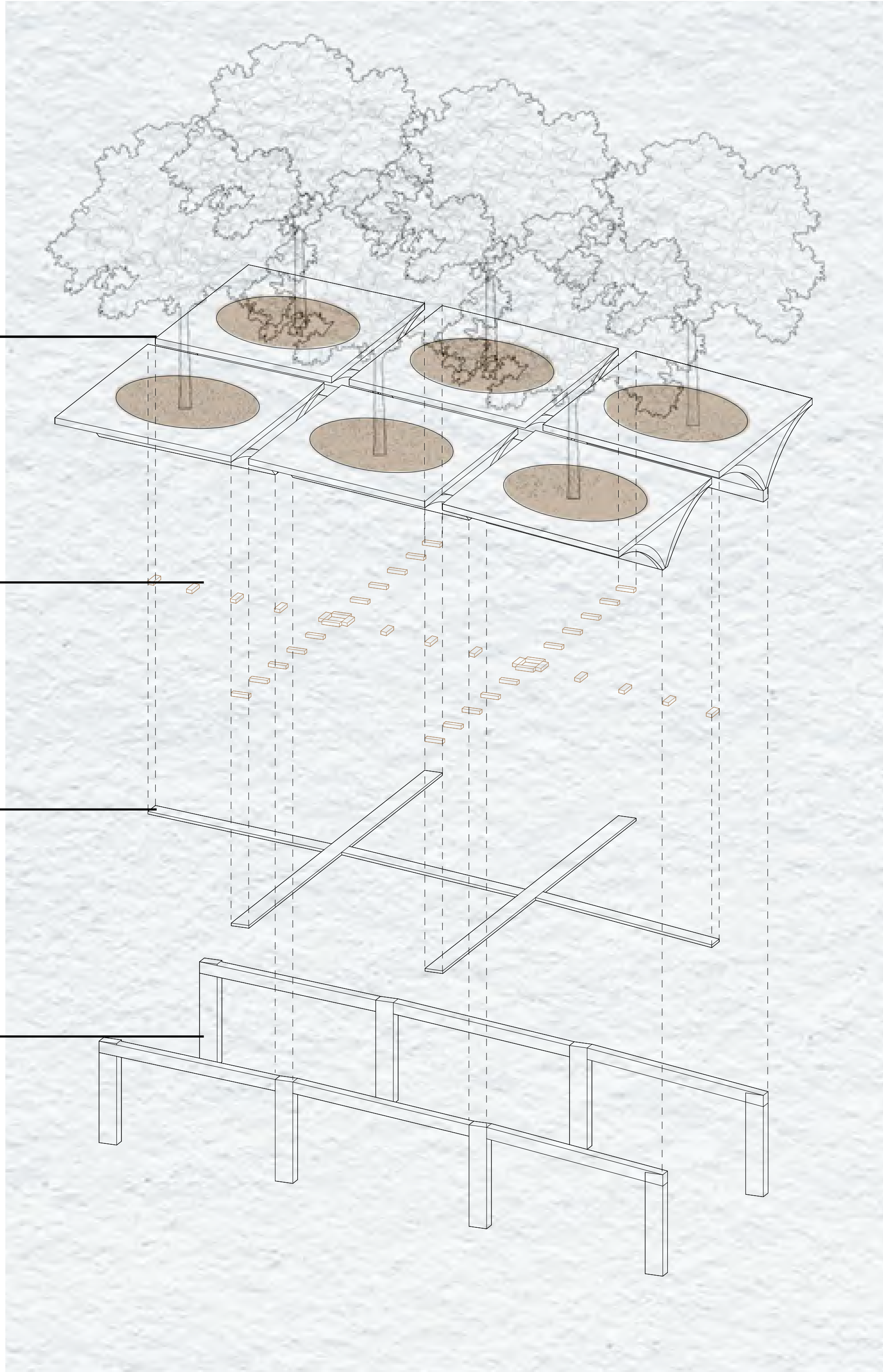
It connects each part of the roof and is made by wood.

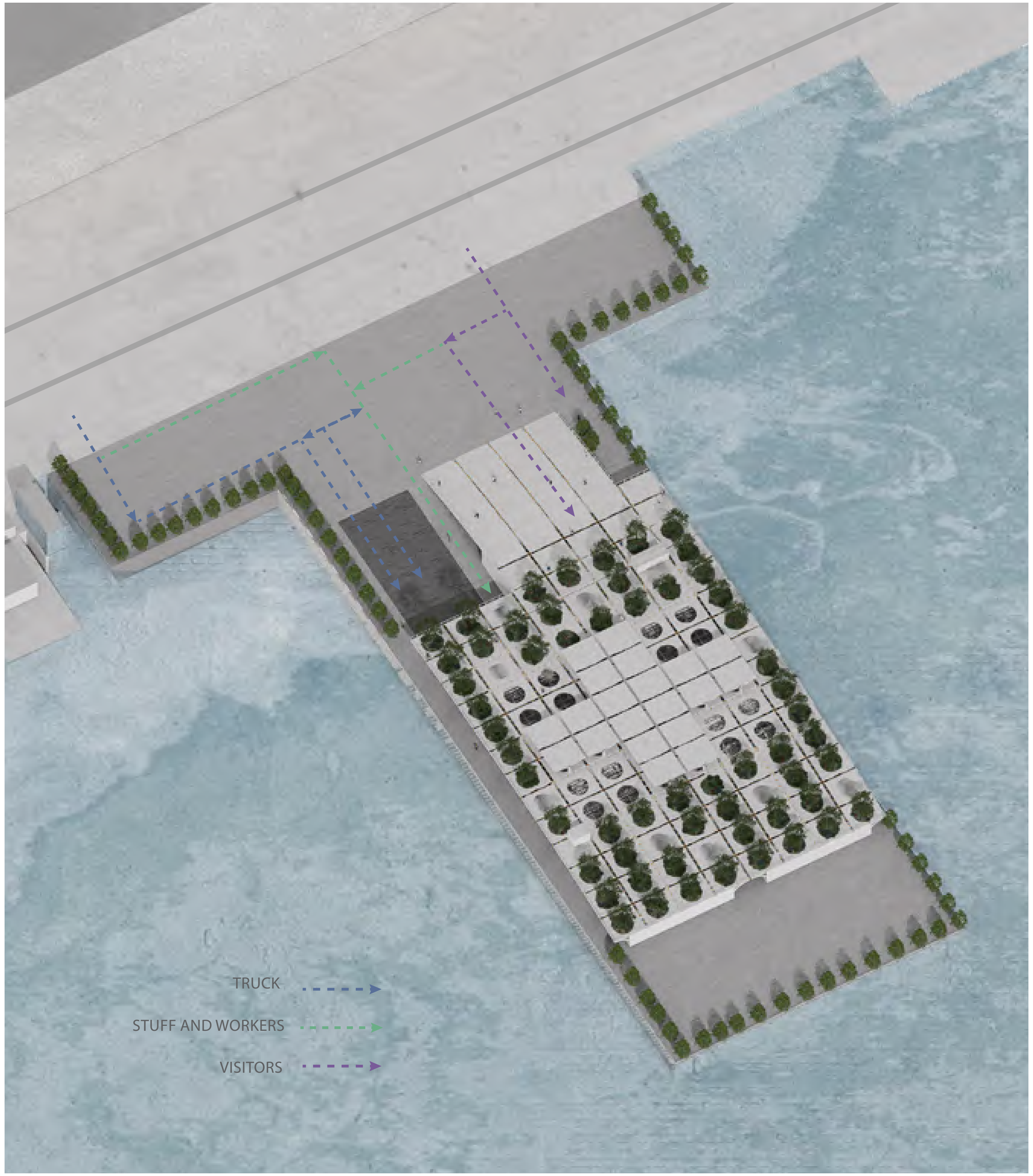
GLASS

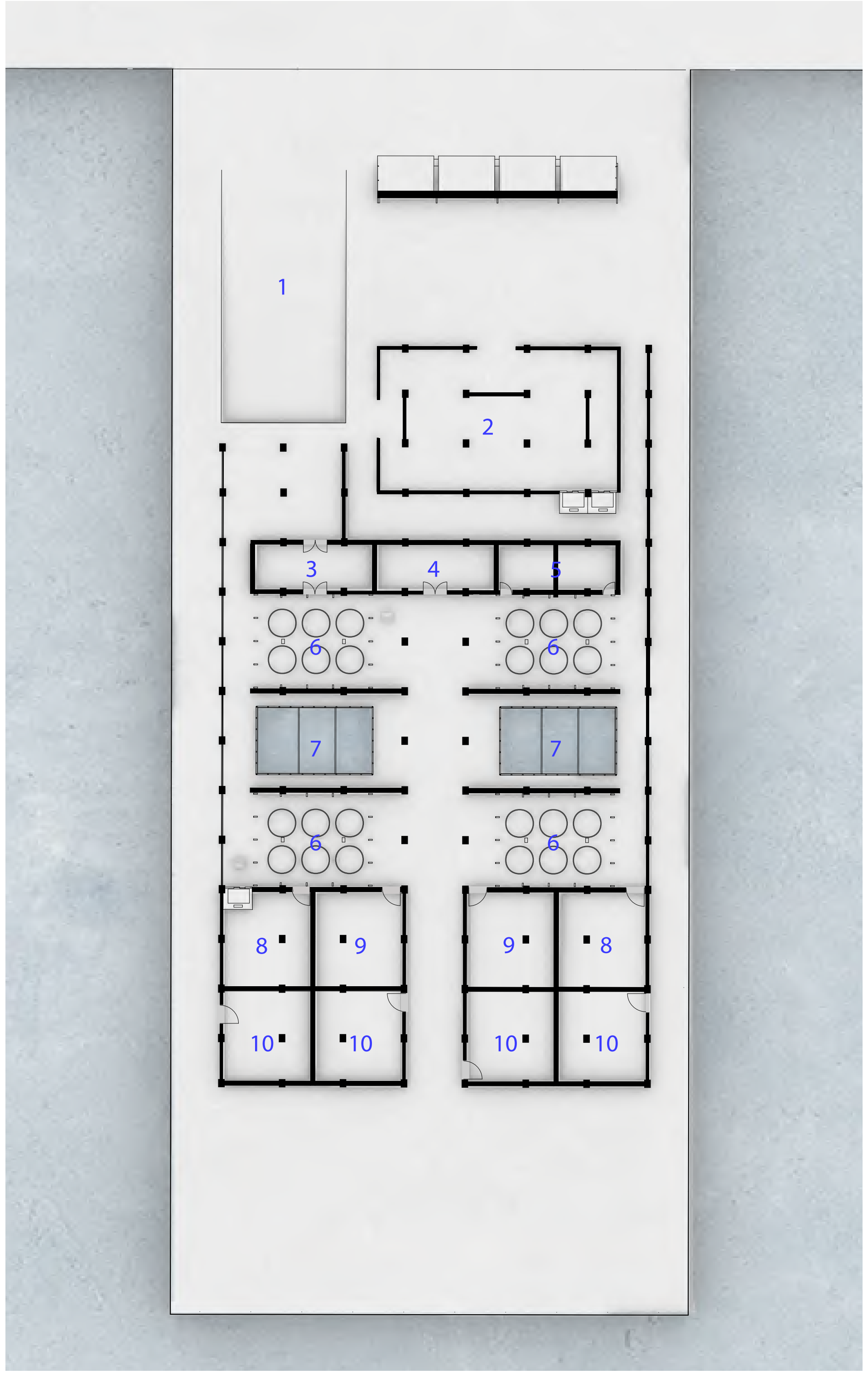
Fill the gaps in the roof

COLUMNS AND BEAMS

Support the entire roof structure.







1. Lodaing doc
2. Visitor Center
3. Cold Storage
4. Havesting Space
5. Bath room
6. Fish Tank
7. Filter System
8. Storage
9. Laboratory
10. Office

Filter System

The filter system includes sedimentation tank, mechanical filtration and bio filter.

Intake pump

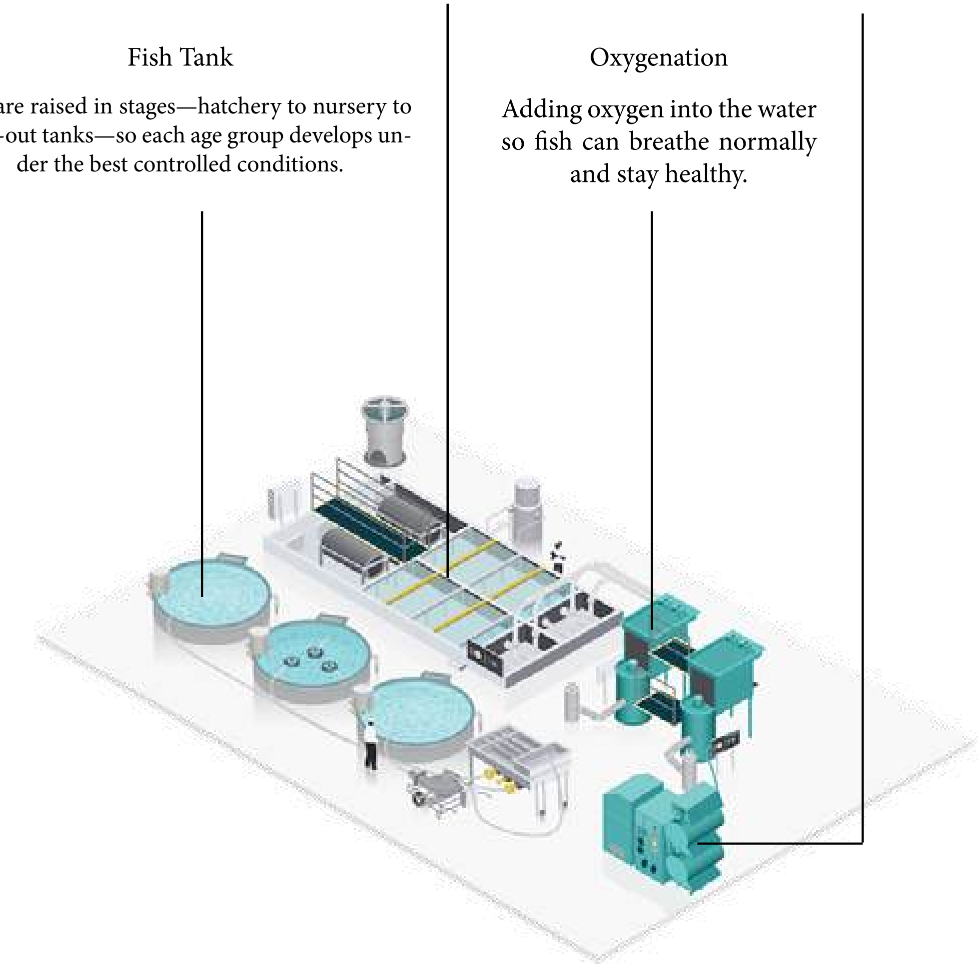
An intake pump is the machine that draws water from the river or sea into the fish farm,

Fish Tank

Fish are raised in stages—hatchery to nursery to grow-out tanks—so each age group develops under the best controlled conditions.

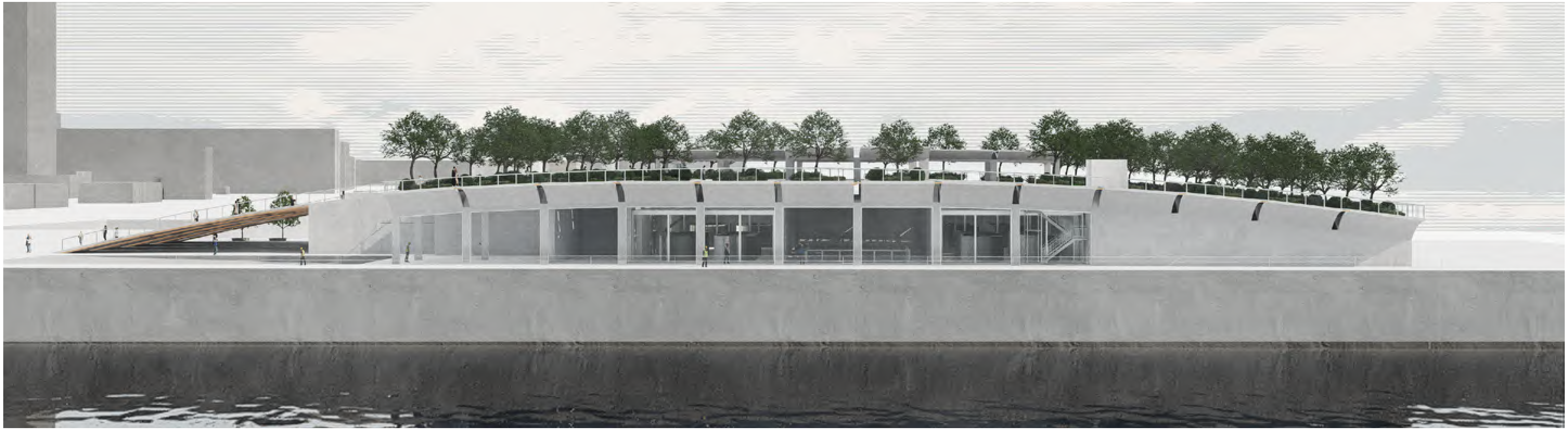
Oxygenation

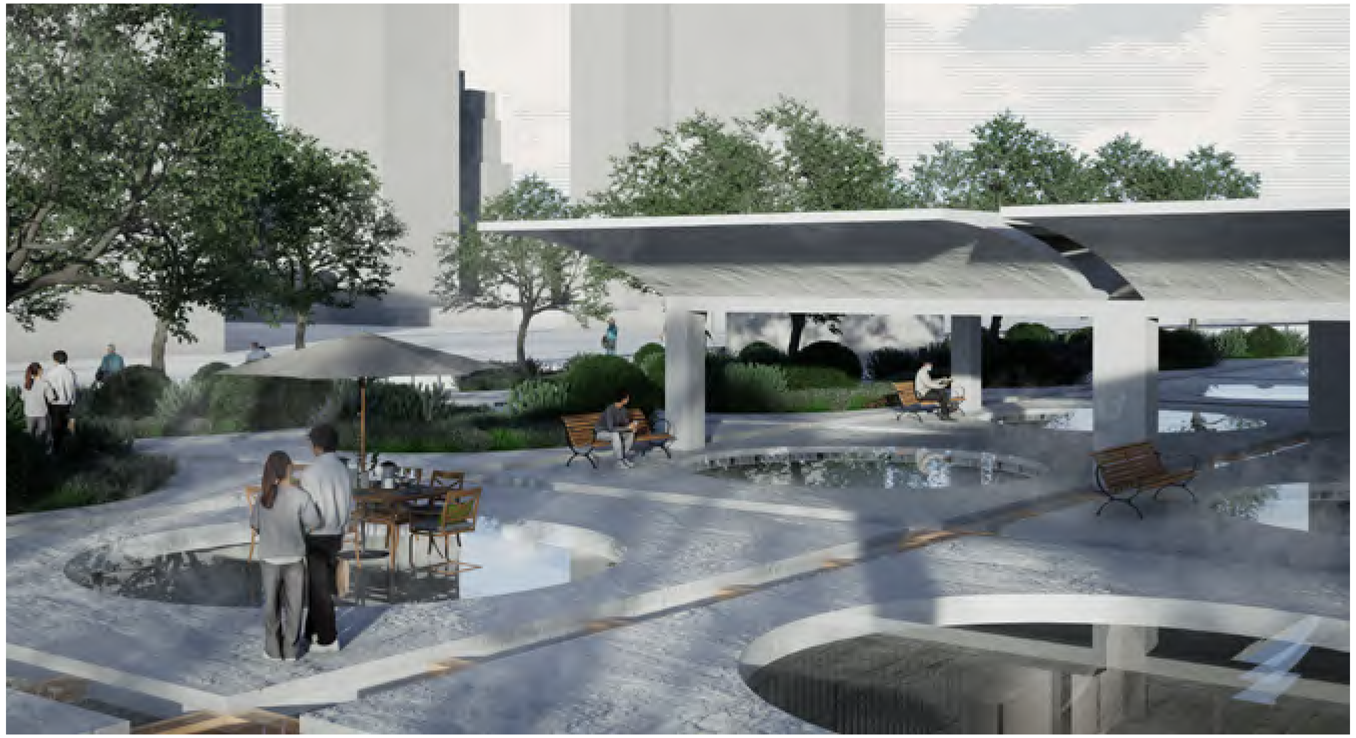
Adding oxygen into the water so fish can breathe normally and stay healthy.



This section shows a terraced public landscape built above a working fish-farm facility. The sloped roof becomes a walkway with trees and planting, while the interior below houses aquaculture tanks and research spaces. A central demonstration pool anchors the section, supported by a dense piping and filtration system in the basement that circulates, treats, and pumps water throughout the fish-farm operations.

The building uses exposed concrete as its primary structure, giving it a solid, monolithic presence along the waterfront. Large glass façades open the interior aquaculture spaces to light and view, contrasting the heaviness of concrete with transparency and precision. Above, a thick planted soil layer forms a gentle green roof that integrates trees, pathways, and public gathering spaces. The elevation reveals how the fish-farm laboratories, filtration rooms, and research facilities are embedded beneath this landscape. The project merges ecology, science, and public engagement, transforming an industrial program into a civic terrain where materiality and environment work together.





Exposed concrete vaults and large glass panels create a clear, durable interior. Soft light and structural shadows form a clean environment suitable for fish-farm research and continuous operational work..

Circular openings expose reflective water surfaces beneath a light concrete canopy. Trees, planting, and seating create a calm public landscape that blends leisure with subtle visibility into the fish-farm infrastructure below.

Sunlight enters through overhead openings, washing across exposed concrete walls and walkways. The central water basin sits below a clean, industrial platform, where railings and clear circulation support safe, efficient fish-farm operations

Soft light washes across exposed concrete vaults as the interior opens directly to the waterfront. The arched structure supports the planted roof above while framing views outward, creating a calm, durable promenade that links research spaces with the public shoreline.

ERASING THE SHORELINE

Sea Silk Group

Runyu Tang(Arvin)

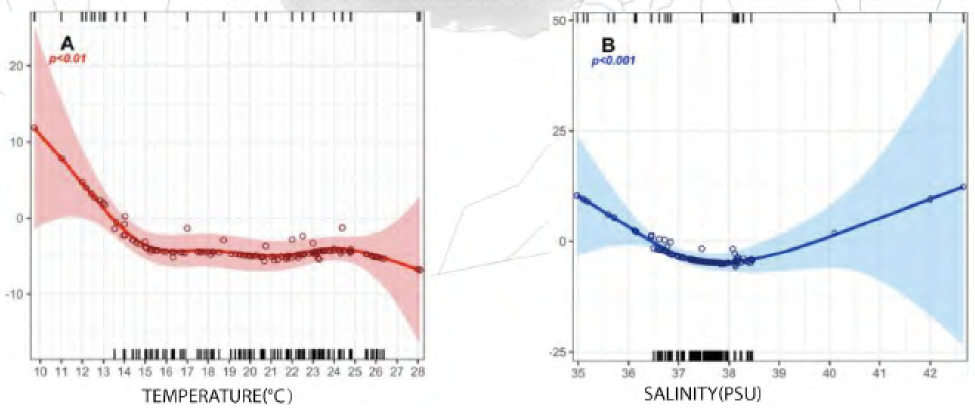
DISEASE DISPERSION BY SURFACE CURRENTS

The parasite Haplosporidium pinnae has probably dispersed regionally by currents

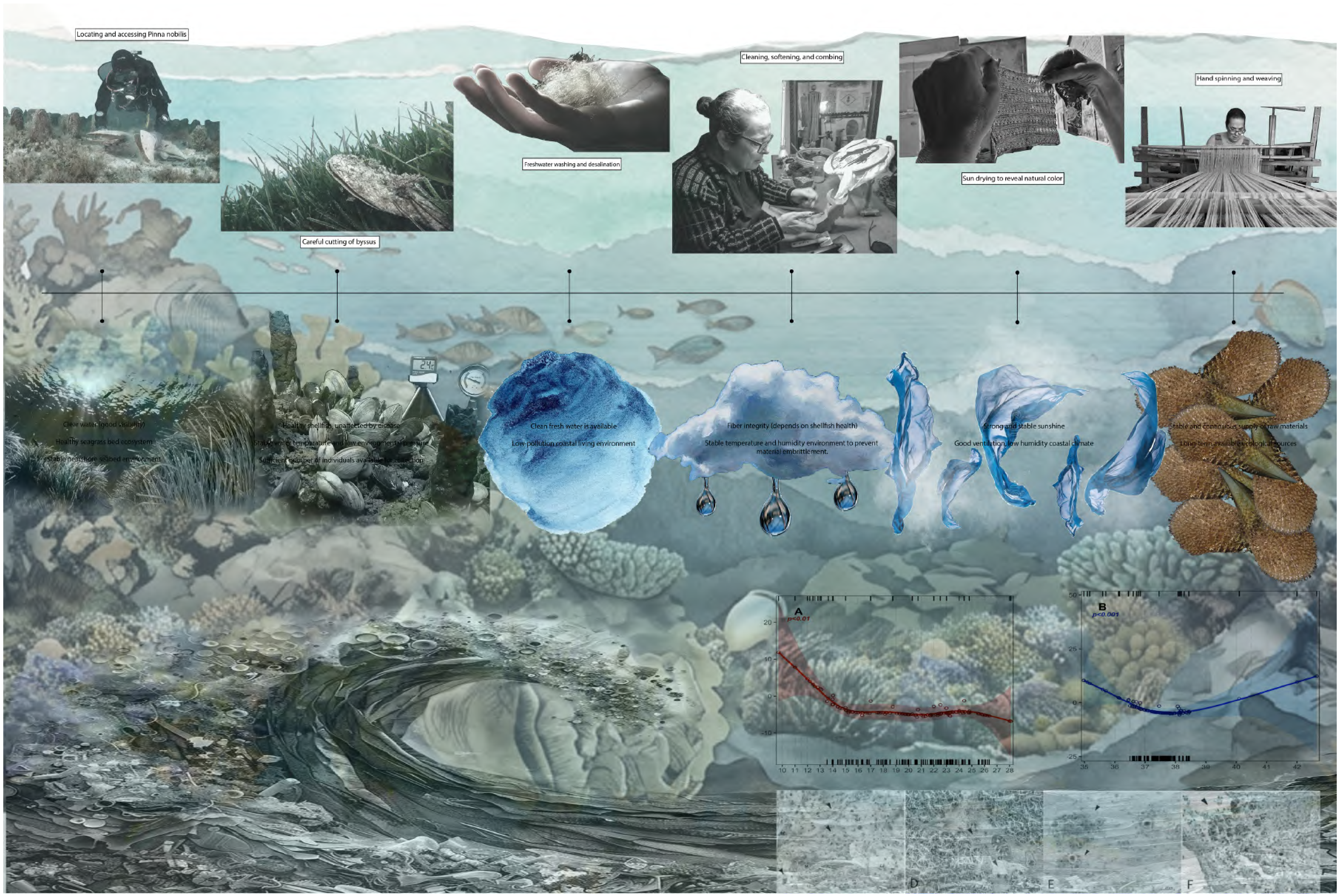
Observed vs. estimated dates for the arrival of particles subset at buffer areas in the three drift simulations conducted

Simulation	Area	LonLat p_1	LonLat p_2	$Omme_f$	AEt_f	FEt_f	LEt_f
Backward	*Balearic Islands*	2.45°E 39.50°N	1.44°E 38.91°N	2016/09/28	2016/09/29	2016/09/09	2016/10/16
Forward	*L'Ametlla de Mar*	1.42°E 41.14°N	0.87°E 40.91°N	2017/07/14	2017/07/11	2017/06/25	2017/07/24
Forward	*North Catalonia*	2.99°E 41.71°N	3.22°E 42.05°N	2017/12/07	2017/11/11	2017/11/07	2017/12/04

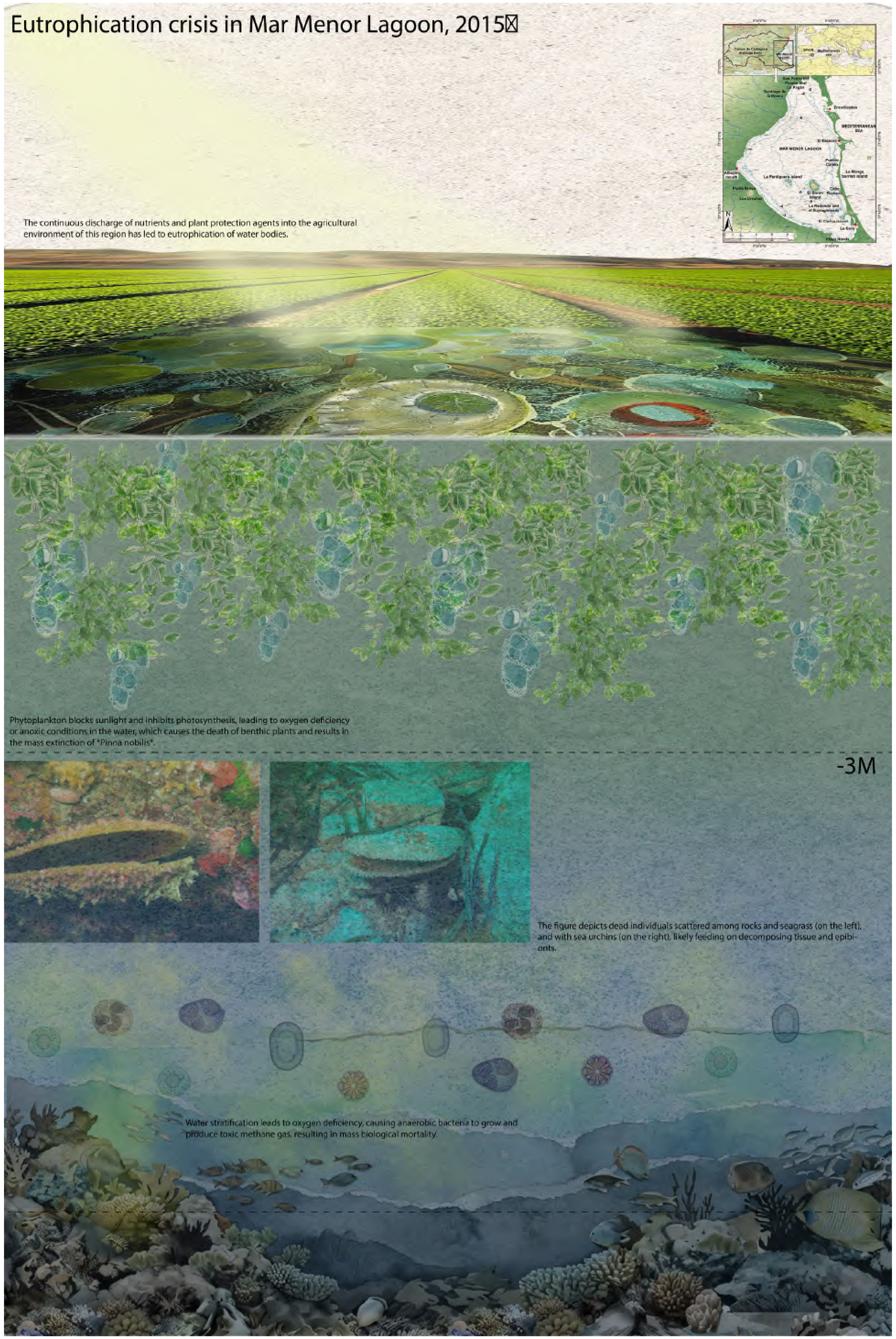
TEMPERATURE AND SALINITY APPEAR TO BE DECISIVE IN THE DEVELOPMENT OF THE DISEASE



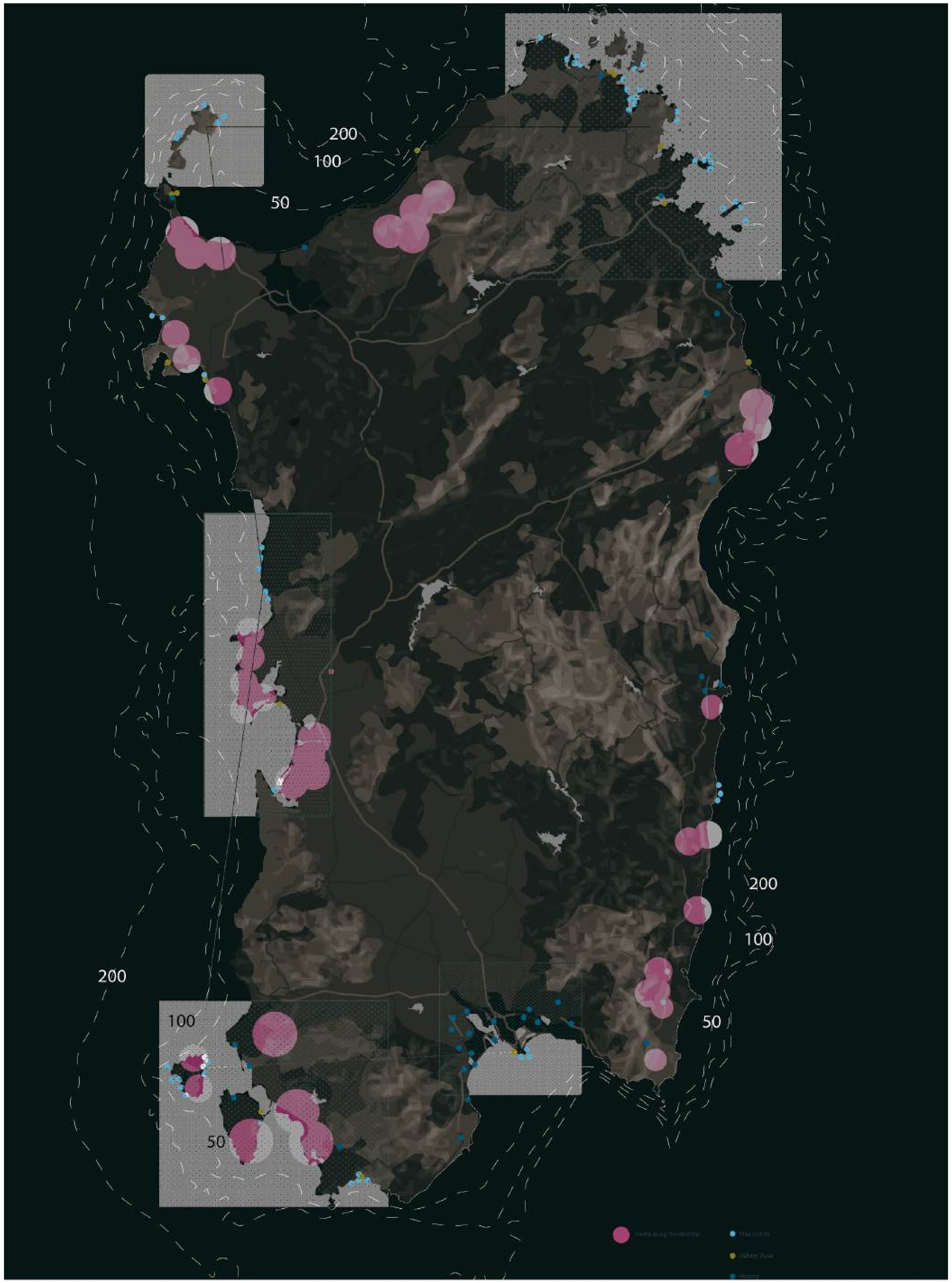
This map explains how the decline of Pinna nobilis is not only a local problem, but also a regional crisis shaped by Mediterranean currents. The red points show infected or affected populations, while the highlighted areas indicate simulated disease movement between coastal sites. Surface currents may transport the parasite Haplosporidium pinnae across long distances, connecting distant habitats through water flow. The diagrams also suggest that temperature and salinity influence disease development. By combining species distribution, current simulation, and environmental data, the drawing shows how ocean movement can accelerate infection, habitat loss, and the wider extinction risk of Pinna nobilis.



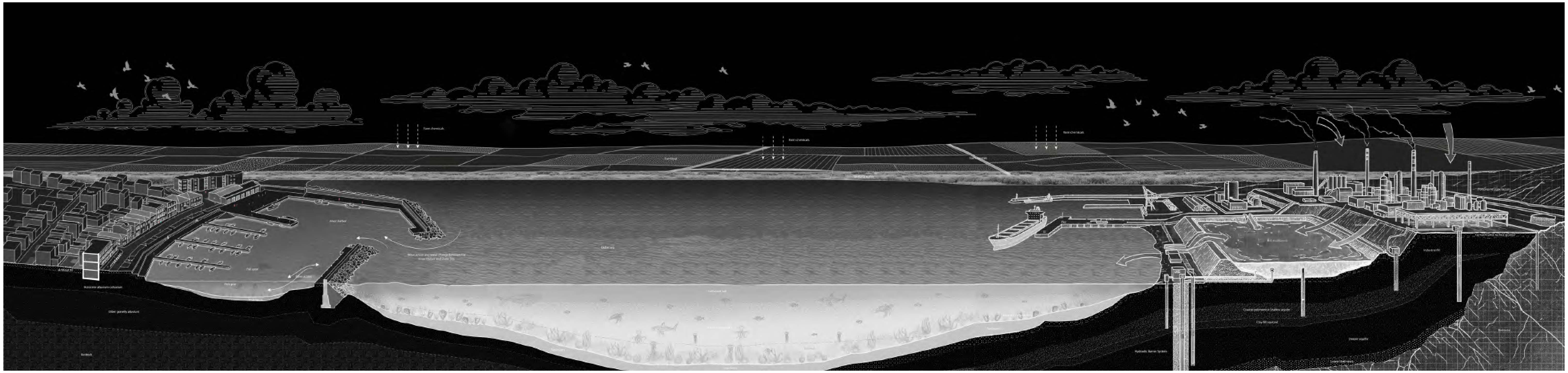
This drawing explains the traditional process of making sea silk and the environmental conditions behind each step. It begins with locating *Pinna nobilis*, carefully cutting the byssus, washing and desalinating the fibers, then cleaning, softening, combing, spinning, and weaving them into fabric. Each stage depends on specific ecological conditions, such as clean seawater, stable temperature, healthy seagrass habitats, and low pollution levels. The image also shows how marine pollution disrupts this relationship. When water quality declines and the shellfish habitat is damaged, both *Pinna nobilis* and the cultural practice of sea silk production become endangered.



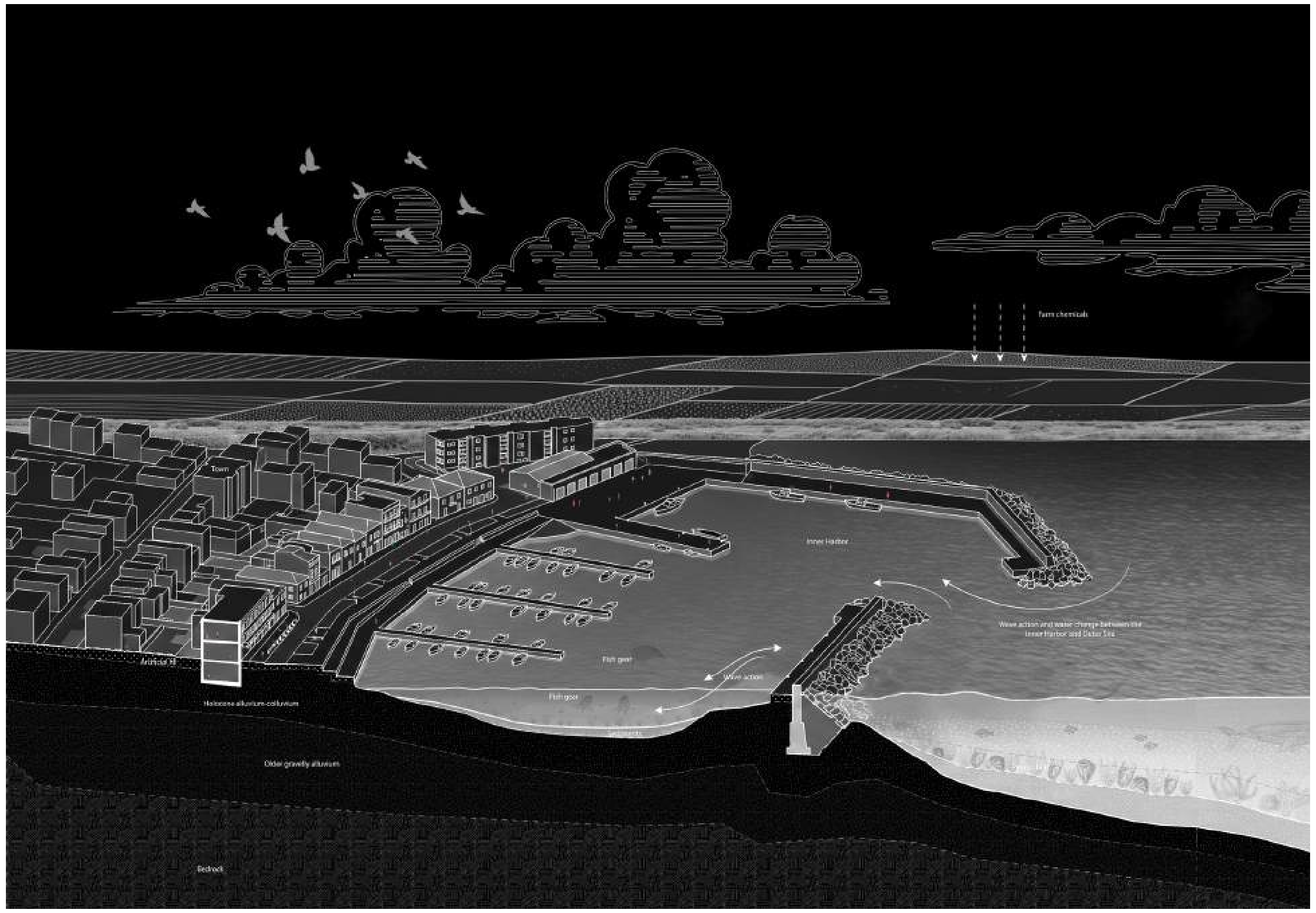
This drawing uses the Mar Menor Lagoon eutrophication crisis as a reference to explain how agricultural pollution can destroy a coastal ecosystem. Fertilizers and plant-protection chemicals from nearby farmland enter the lagoon through runoff and groundwater. These nutrients cause rapid phytoplankton growth, turning the water cloudy and blocking sunlight. As photosynthesis decreases, oxygen levels drop, creating anoxic conditions in the water. The diagram shows how this process affects different layers of the lagoon, from floating algae to dying seabed habitats. For species such as Pinna nobilis, which depend on clean water, oxygen, and stable seagrass environments, eutrophication can accelerate habitat loss and extinction.



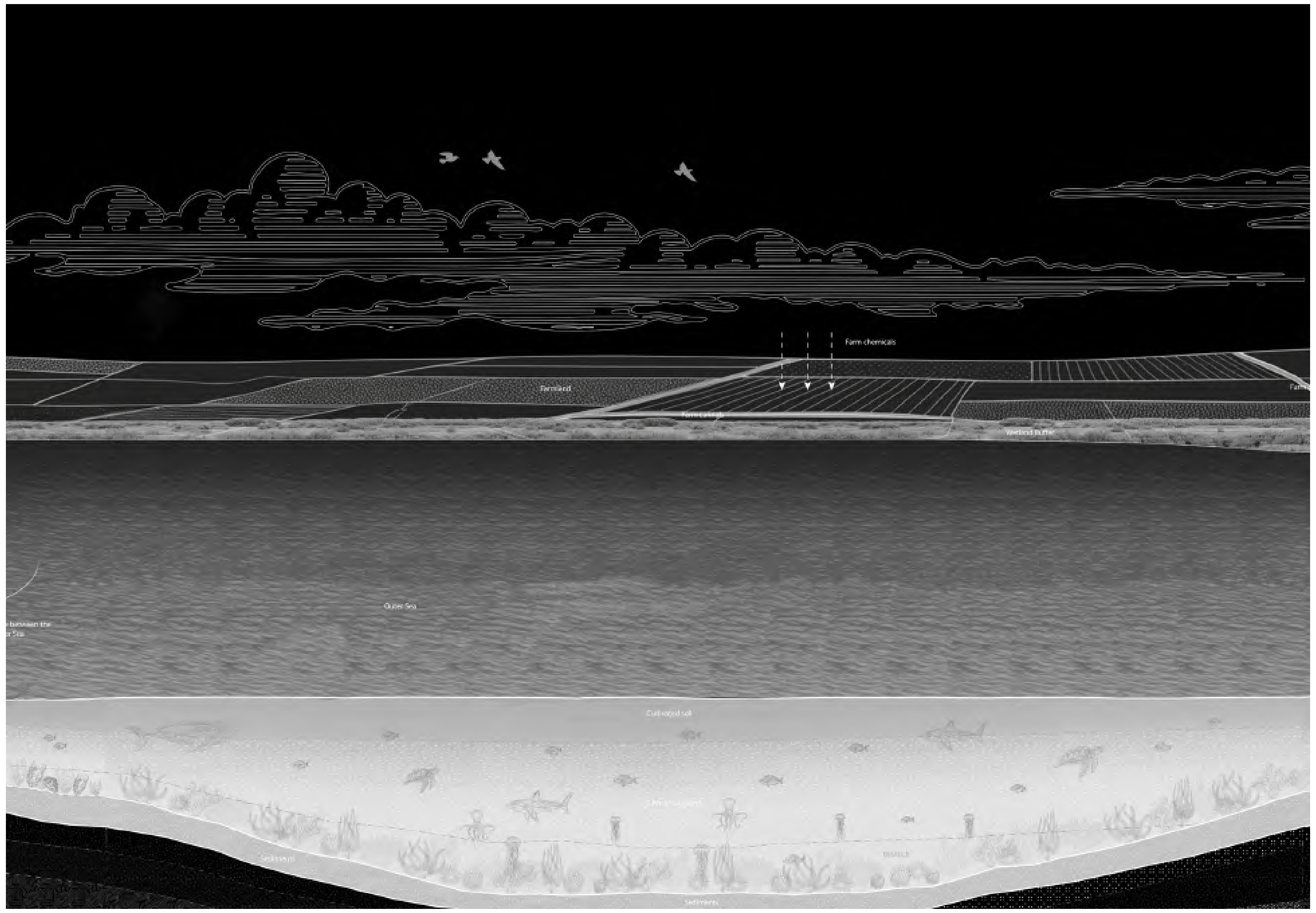
This plan maps Sardinia's coastal environment and the overlapping human activities that affect the habitat of *Pinna nobilis*. The dark landmass shows the island's terrain, while the surrounding white flow lines suggest sea currents moving around the coast. Pink circles mark areas of farming or human land use, and blue dots indicate the distribution of *Pinna nobilis* along the shoreline. The highlighted rectangular zones zoom into sensitive coastal edges where agriculture, fisheries, factories, and marine habitats meet. The drawing shows how inland activities and coastal development are connected to underwater ecological change, especially through water movement, pollution, and habitat disturbance.



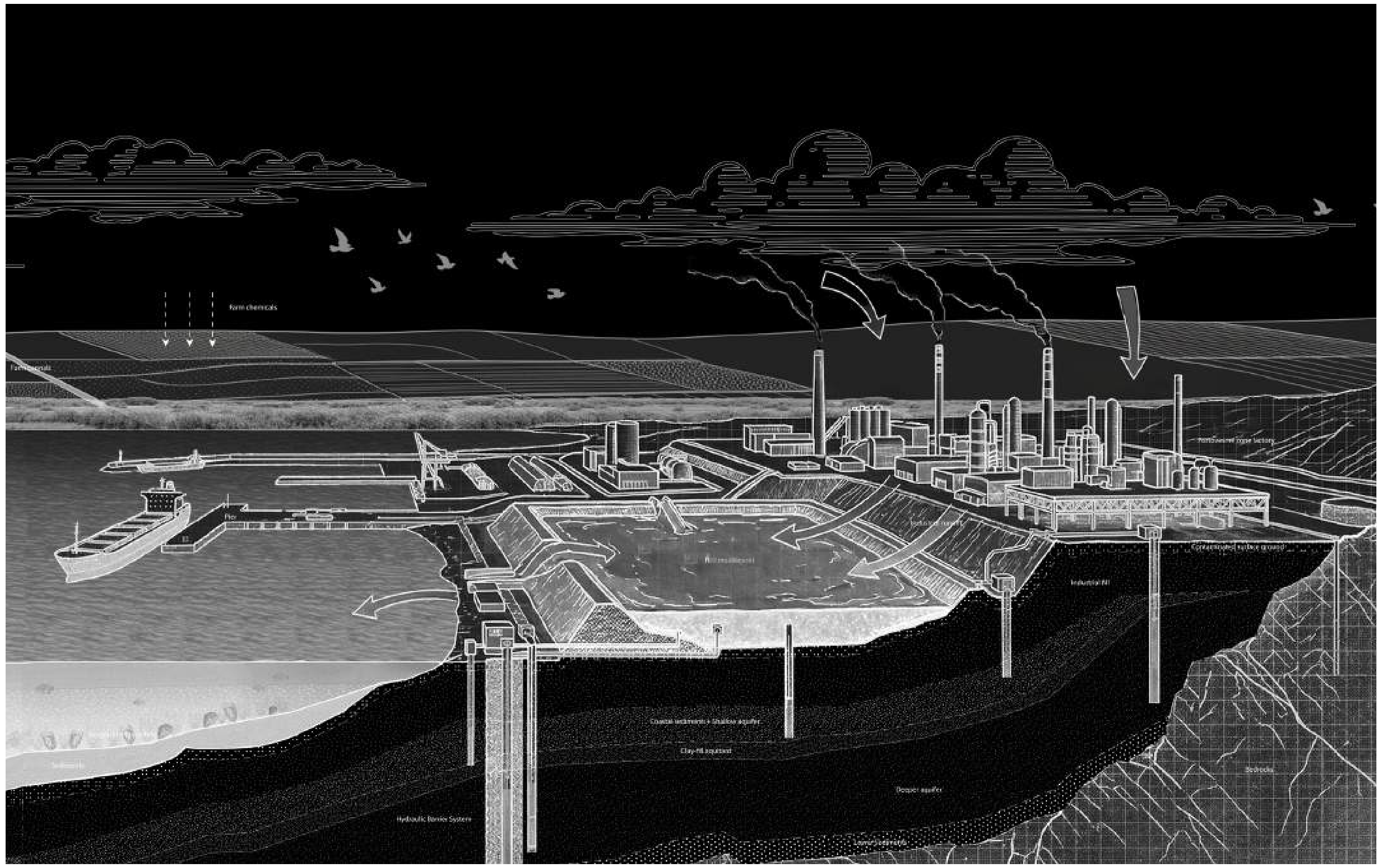
This section illustrates how human activities reshape the coastline and gradually destroy the habitat of Pinna nobilis. Urban development, harbors, agriculture, fisheries, and industrial infrastructure all alter the coastal edge, both above and below ground. These interventions change the shoreline's form, disturb underwater ecosystems, and affect water movement, sediment conditions, and pollution levels. As a result, the marine environment becomes less suitable for Pinna nobilis, a species that depends on stable and healthy coastal habitats. The drawing reveals the connection between human occupation of the coast and ecological degradation, showing how these cumulative changes accelerate the species' decline and possible extinction.



This drawing focuses on the urban and harbor edge of the coastline, showing how human intervention transforms both land and sea. The construction of marinas, breakwaters, roads, and dense urban blocks replaces the natural shoreline with hard infrastructure. These changes alter water circulation, sediment movement, and the ecological balance of the coastal zone. Agricultural land in the background further contributes runoff and pollution, which travel toward the sea. Together, these visible and invisible transformations degrade the marine habitat of Pinna nobilis. By tracing the connection between coastal development and environmental change, the section reveals how human activity accelerates the species' decline toward extinction.



This part of the section shows the agricultural landscape behind the coastline and its connection to the marine habitat below. Although the farmland appears distant from the sea, its irrigation, fertilizer use, and surface runoff can gradually move toward the coastal water system. These land-based processes change the quality of seawater by increasing nutrients, chemicals, and sediment flow. Beneath the water, the section reveals a fragile ecological zone where Pinna nobilis depends on stable seabed conditions and clean coastal water. The drawing shows that even indirect human activities inland can reshape the shoreline environment and contribute to the decline of this species.



This part of the section focuses on the industrial coastline, where factories, ports, and infrastructure heavily transform the natural edge. Industrial buildings release smoke and waste, while docks, roads, and ground excavation reshape the shoreline into a controlled production zone. These activities affect both surface water and underground systems, changing pollution levels, sediment movement, and groundwater conditions. The arrows show how contaminants and altered flows move from land toward the sea. Below the surface, the section reveals disturbed soil and unstable coastal layers. Together, these changes damage the habitat of Pinna nobilis and accelerate the species' ecological decline.