Our Stories begins with a *Seed*
Library-City, a place to nurture, play and learn

Our Stories begins with a *"seed"*

a Public Condenser where we nurture, learn, and grow.

Ferrari (Tzu-Shou) Huang

Content:

Chapter 1. Defining the Seed

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Chapter 2. Site Research – The Challenges of Sundholm

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Chapter 3. The Solution – Building Hard and Soft Power

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Chapter 4. Three Research Frameworks
Learning through play
Nature as Therapy for Mental Health
Nurture as a Habitat for Biodiversity and Nonhuman Life

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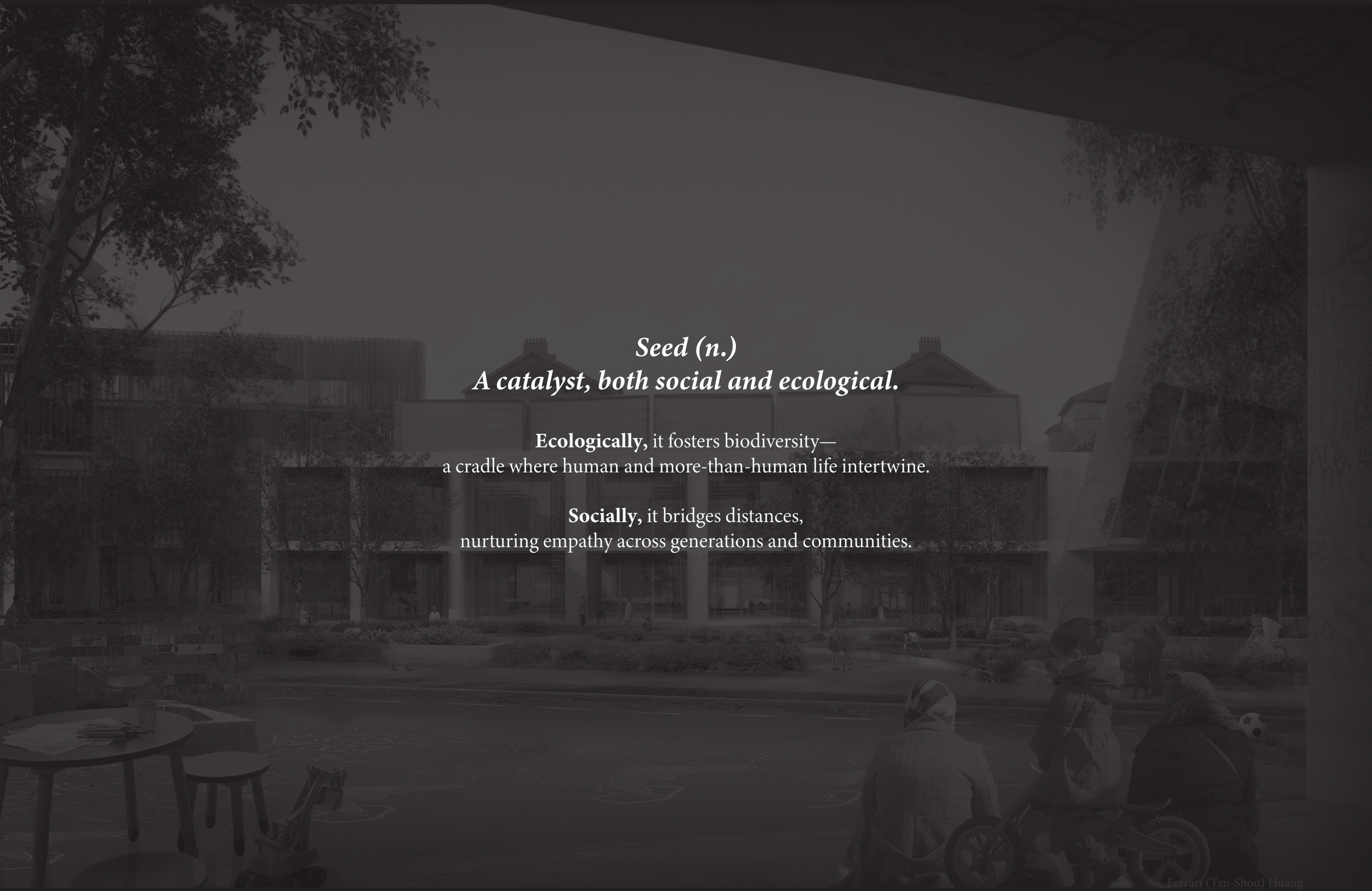
Chapter 5. Architecture Across Scales – L, M, S, XS
L – The Triangle Site: Spatial division and urban strategy
M – The Five Typologies
S – Inbetween
XS – The Prototype and the architectural integration



Seed (n.)
A catalyst, both social and ecological.

Ecologically, it fosters biodiversity—
a cradle where human and more-than-human life intertwine.

Socially, it bridges distances,
nurturing empathy across generations and communities.

Ferrari (Tzu-Shou) Huang

*How do we plant the **seed**, together? By **designing with Empthy**.*

Ferrari (Tzu-Shou) Huang

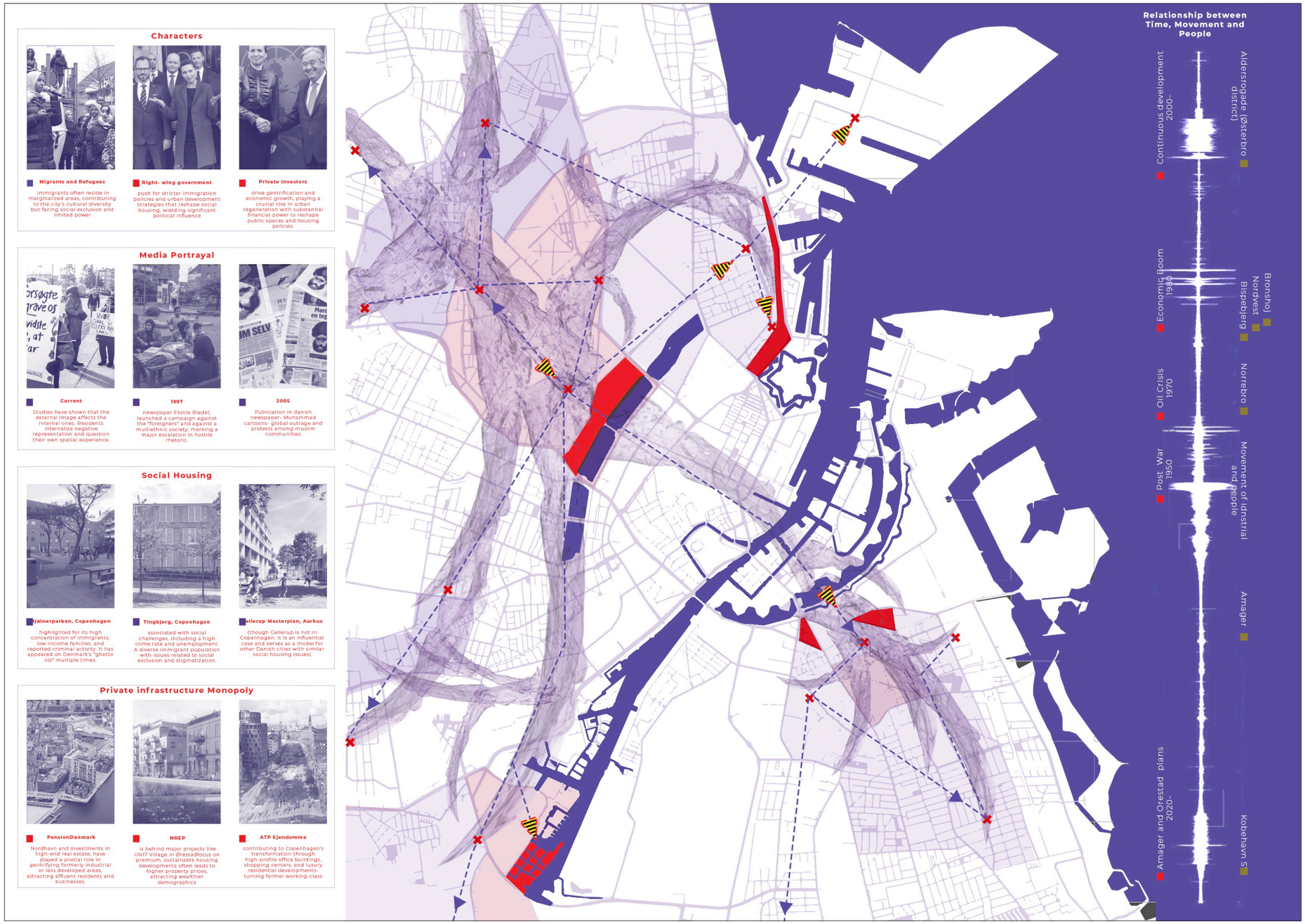
Site Research

“Ghetto”- Parallel Society

Ferrari (Tzu-Shou) Huang

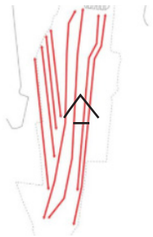
Mapping power: Main Characters, Protests and Media Portrayal

The transition of power; from Welfare state to Neo-Liberalism

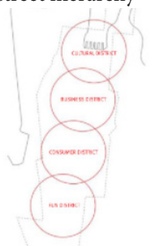


What are the current problems and potentials of the site?

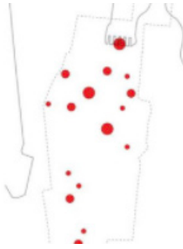
Problems



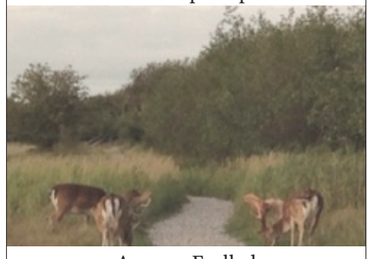
Lack of street hierarchy - Vertical



A mono-functional city



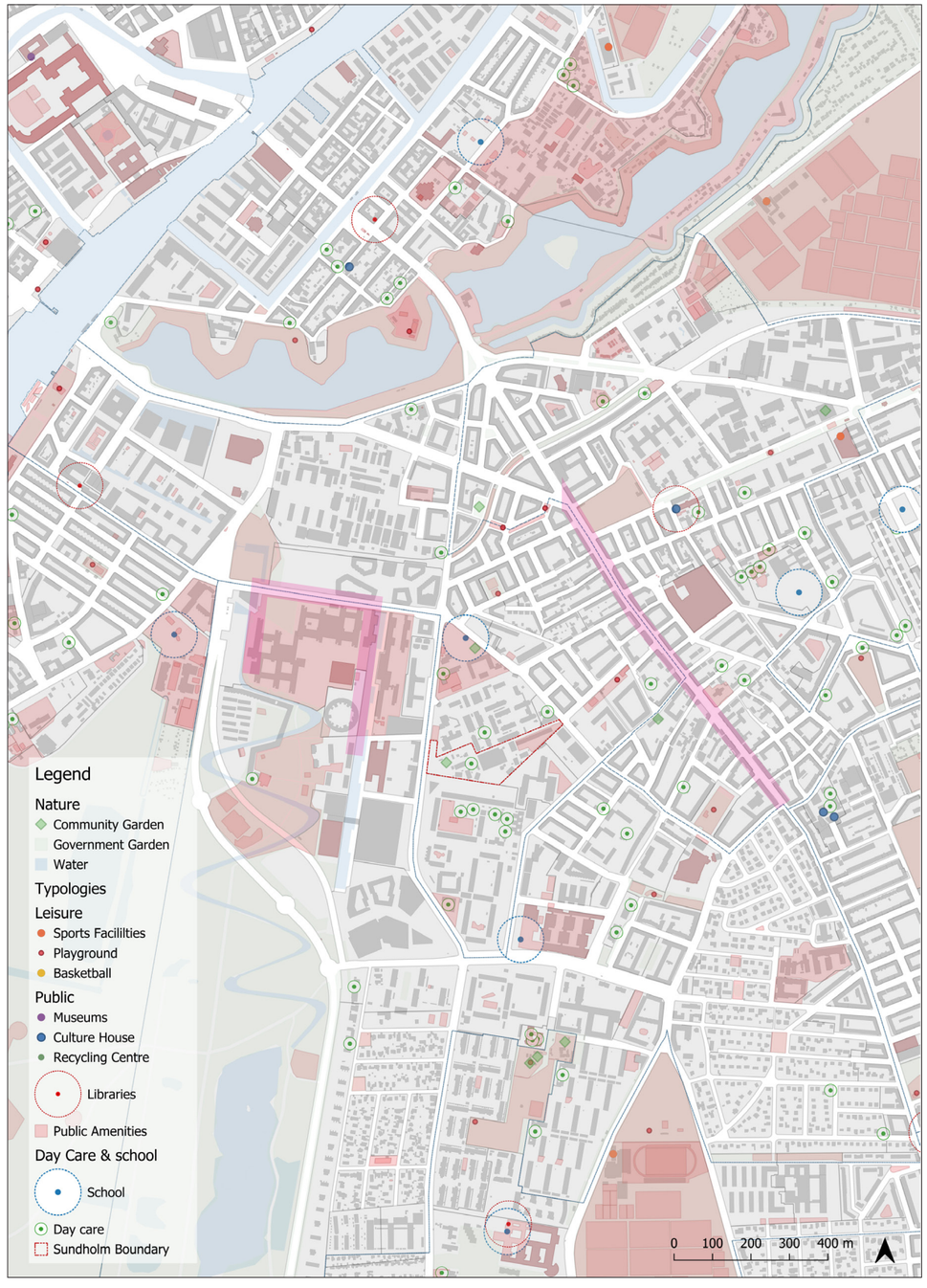
Scattered Open Spaces



Amager Faelled

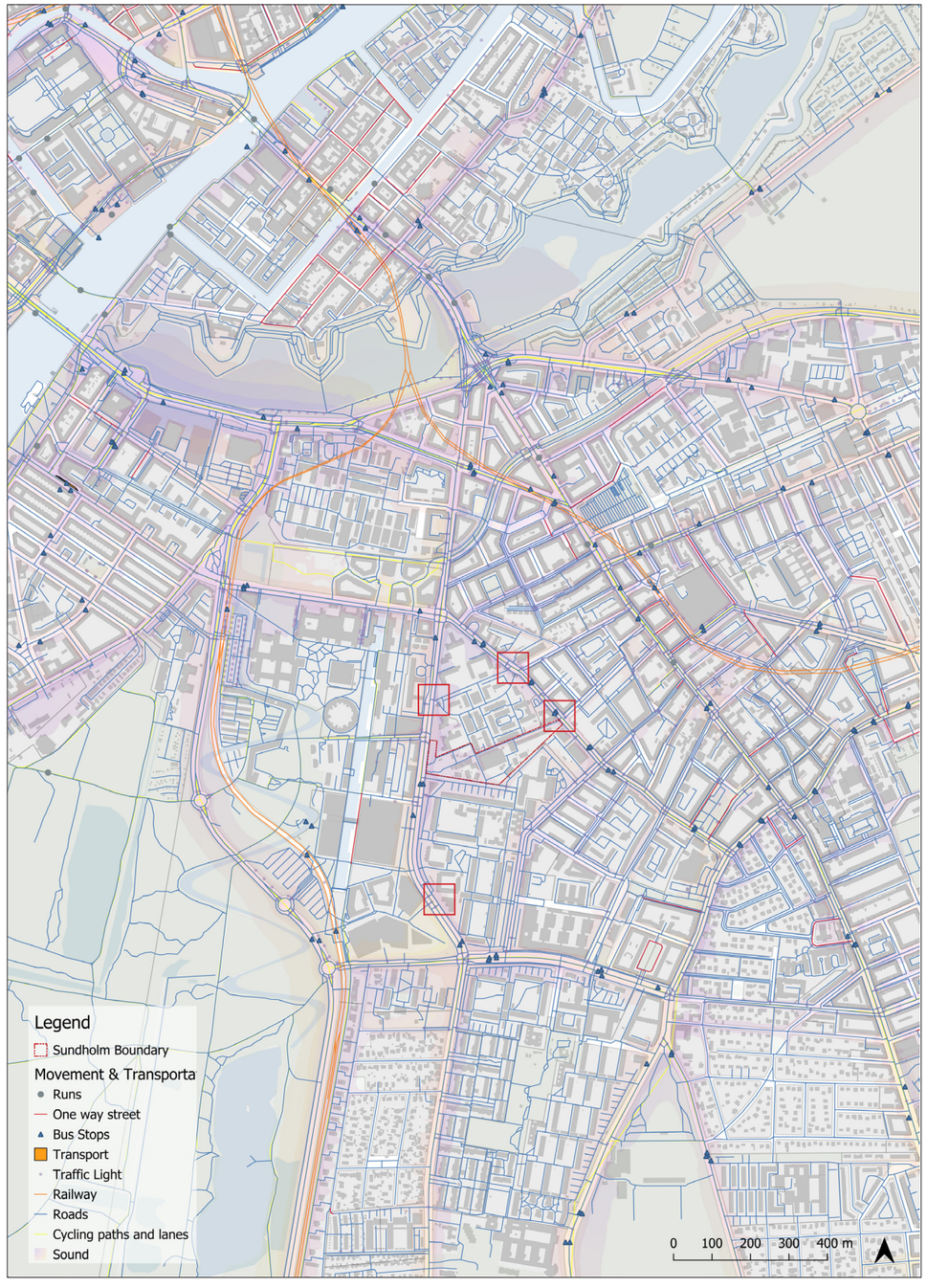
IT University Kobehavn

Typology and function



Mapping out connections between play, learn and nature

Movement and Circulation

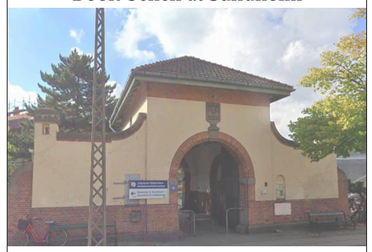


Government isolate Sundholm from the grid. Vertical access and lack of Horizontal. Thresholds/ Barries

Introduction to 'Hostile Architecture'

Hostile Architecture

Book-bench at Sundholm



Tunnel leading to Sundholm

Motorized fence with spike

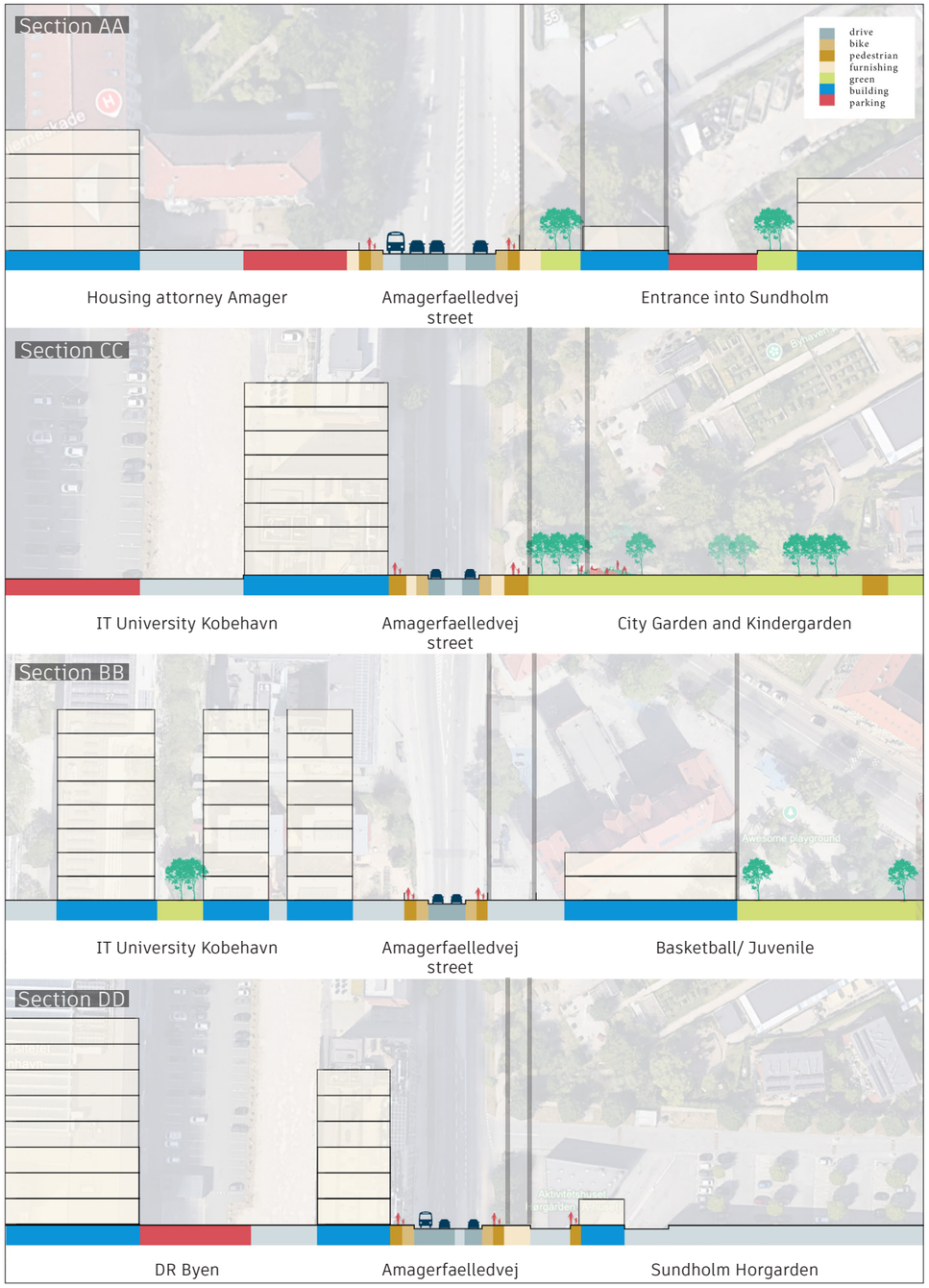
Slanting bars over heating vent

Bench outside food hall

Site Analysis - connecting opportunities

How to change the Introverted Sundholm to a inviting streetscape?

Site Analysis throu Section



Pointing out thresholds and barriers. No Streetfront and entrances? An Inner world

The Marginalized Community in Sundholm

Parallel Society characters includes:

Homeless Individuals

Migrants and Refugees

Drug Addicts

People with Alcohol Dependence

People with Mental Health Issues

Marginalized Families

Ex-Prisoners

Socially Excluded Youth

Long-Term Unemployed

Elderly People without Support Systems

Interviews conducted at site

Children from Sundholm:
" all my friends live here and they play out a lot and school is 20 minutes away"

"kids roam on the streets in their free time - 6-7th grade and further on - SPORTS, football is the national sport (also handball, badminton, volleyball) lack of skating areas"

Media Portrayal of Sundholm
"This place is doomed - drugs and alcohol."

"not a nice area"

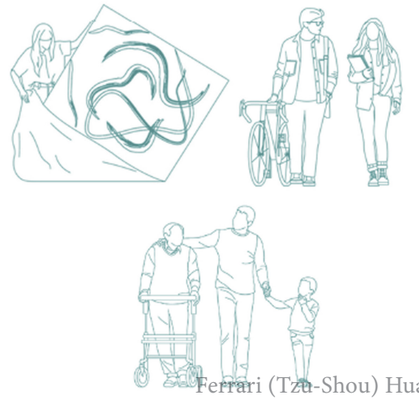
"does not want to live here"

University Students
"Personally never been but heard about it, seen the documentaries. People who live there suffer from mental health, addictions. Never felt in danger in the area. If you study here you don't really know the sundholm - they don't mix."

"they might behave according to the relation they have to the people - kind of a role model."

Communities from Sundholm:
"They characterized the people in the area as a mix of different groups: "the crazy," children, and fellow artists.
Despite the variety of residents, there is a feeling of community. The artists appreciate the vibrancy and uniqueness of the space, highlighting it as an important aspect of the area's identity""

"politicians stigmatize people living in ghettos, making them feel more excluded and unstable"



Our Stories begins with a *Seed*
Library-City, a place to nurture, play and learn

Building hard & soft power

How Can we dismantle the “Ghetto” connotation?

Ferrari (Tzu-Shou) Huang

How to reconstruct negative Media Portrayal?

Joseph Nye's book 'Power and Interdependence"

Hard Power

Coercive control through force or tangible resources, such as housing, education, healthcare, job opportunities, transportation, gated communities, surveillance systems, or urban planning that enforces segregation.

Identity

Soft Power

Persuasive influence through culture, values, and ideas, like designing community centers, inclusive public spaces, or murals that reflect the identity and aspirations of marginalized communities.

A Home for humans and non-humans

The Methodology behind this concept.

Education
Learn through Play

How can different targeted groups perceive play and learning?

Healthcare and Wellbeing
Heal through Nature

Architecture qualities experiences. Introversion and Extroversion

A Public Condenser

Job opportunity
Biodiversity a place to nest

Sustainability movement, green corridors and biodiversity connection.

The 3 phase research framework

Ferrari (Tzu-Shou) Huang

The 3 Phase Research framework

Phase 1: Hybridity and Multiplicity

Education
Learn through Play

Learn and Play theorists determine the building's circulation and function. How can different targeted groups perceive play?

Functions and Circulation

+

Phase 2: Healthiness

Hospital- Heal through Nature

Architecture qualities experience is through biobased ecological materiality, facade and indoor/ exterior experience

+

Phase 3: Sustainability

Job opportunity
Biodiversity a place to nest

Sustainability movement, green corridors and biodiversity connection.

Biophilic design- Materiality and Spatial Qualities

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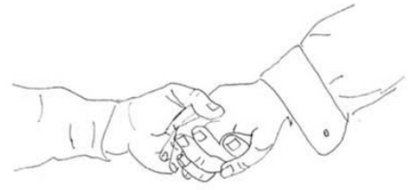


TheNest. The Home

A series of characters within Sundholm and surrounding site, working together as a network like biofilms

Learning city, Fields, and Learning Devices

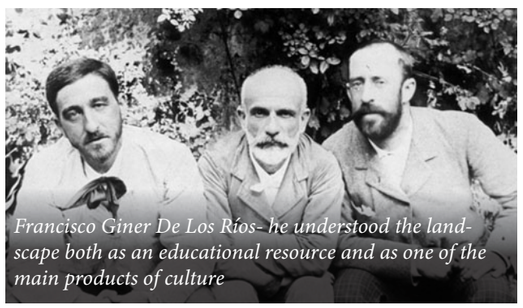
Towards a Playful City → **Play & Learning** → **Where does play happen? Introduction to Intersection** → **Play as a Methodology**

Lefebvre
Lefebvre's notion of the street as a place of 'disorder'. He writes, The street is a place to play and learn. The street is disorder. All the elements of urban life, which are fixed and redundant elsewhere, are free to fill the streets and through the streets flow to the centers, where they meet and interact, torn from their fixed abode. This disorder is alive. It informs. It surprises.

Play is identified as an instigator for creative social encounters, one which redirects and vitalizes the diversity of urban life and values.

Johan Huizinga
Johan Huizinga in Homo Ludens: A Study of The Play-Element in Culture as one of the innate conditions for cultural development. play serves as a medium for learning and cognitive development in the classroom environment.

Andrzej Zieleniec
Andrzej Zieleniec identifies these characteristics as the: functional delineation of spaces and people in the city, a homogenous experience of the environment, and a dominance of traffic over walking and possibilities for lingering in space.



Francisco Giner De Los Ríos- he understood the landscape both as an educational resource and as one of the main products of culture

Johan Huizinga
Johan Huizinga, play is foundational to culture-making Homo Ludens: A Study of The Play-Element in Culture, he argues that the development and generation of culture and civilisation rest upon a 'contested' realm for which the dialectic nature of play is innately present

Reggio Emilia
Reggio Emilia curriculum seeks to playfully engage children with interactive learning experiences in the classroom environment as means to encourage a self-instigated discovery of knowledge. These classrooms are designed to be highly provocative spaces whereby colour, sound, light, and materiality are manipulated to instigate curiosity and creative engagement with learning materials. Social encounters and interactions are also encouraged as part of the students' cognitive development. Therefore, the classrooms are spatially arranged around a central common, referred to as the piazza (the Italian word for the city square)

Paulo Freire
Paulo Freire, an originator of Experiential Education, points to the capacity for learning in developing social consciousness and societal action.

In the Pedagogy of the Oppressed, conscientizacao leads to physical agency in developing and enhancing people's capacities to participate in active citizenships.

he argued current system oppress creativity due to:
1) inherent social hierachy between teacher and student
2) diological approach between teacher and student by allowing an open exchange of dialogue.

play and learning are united by their shared ambitious towards socio-cultural development and transformation against oppresive societal systems and spaces

Quentin Stevens
Quentin Stevens defines what he terms the 'ludic city' as play that does not occur randomly, but at intensifying spaces such as urban intersections which unexpectedly concentrate diverse people and events.

At intersections, proximity, visibility and movement force unexpected social encounters with people of different needs and interests. Dualistically, the vision at intersections can broaden and thereby divert people's attention beyond predetermined routes and objects.

Patricia Hill Colliins and Sirma Bilge
Patricia Hilll Collins and Sirma Bilge in the book, Intersectionality, describe the contemporary notion of 'intersectionality' as an interdisciplinary analytical framework for studying the complexity of human identity and experiences.

When it comes to social inequality, people's lives and the organisation of power in a given society are better understood as being shaped not by a single axis of social division, be it race or gender or class, but by many axes that work together and influence each other.

Play
Play has been implemented across a diverse range of mediums including drawing, collaging, mapping and model making, to investigate and integrate spatial and socio-cultural complexity, or an 'intersectionality', within the built fabric.

Aarti Kanekar
In Architecture's Pretexts: Spaces of Translation, Aarati Kanekar believes that architectural complexity builds through the 'translation' between mediums whereby the richness of meaning accumulates through the "slippages, dislocations, and transformations

It starts with a seed: The diffusion of social innovation in an urban governance context

Urban Gardening as Social Innovation

Case Studies/ Interviews in Copenhagen

Urban Regeneration

Environmental Resilience

Social Resilience

Well-being

Levkoe
Many volunteers in urban gardens mentioned multiple health benefits eg. stress reduction , physical fitness, and an increased understanding of nutrition and healthy eating.

Louv
As cities get denser, community gardens may provide in, some cases, the only opportunity for residents to experience contact with nature and biodiveirsty.

Firth et al.
Urban gardening initiatives provide shared third space and joint atcitivites, inculding among others growing, cooking and eating, which allowed people with different background and ages to interact. the green aspect of garden invite for leisure use. As a result of the diversity of the people involved, it also makes an ideal place to integrate immigrant communities within the local one and provides community access to locally grown food.

Krasny and Tidball
the ability of urban community gardens to gather together individuals holding diverse practical and scieitific knowledfge, thereby adding an element of knowledge exchange and educatino to the gardening experience; foster cross-displinary learning, integrate science, environmental learnings, civic actions, as well as multicultural and integrational understanding.

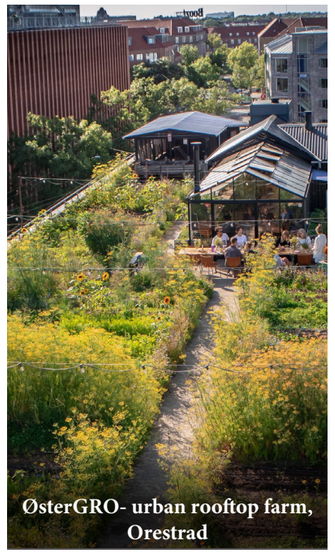
"we have converted an anti-terrorist wall into a beautiful bench on top, that is pleasant to look at" [...] nobody wants Copenhagen to be transformed in a concrete jungle" (Respondent 11); "we make the city greener and more beautiful"

"with drug addicts we wanted to create a sense purpose in their lives" ; "after we started this gardening program, less criminality has been noticed in the area [...] it is really easier to talk to homeless people when all are working in the garden and ask each other for advices"

Byhaven 2200 (Nørrebro's Urban Garden)

"the urban farmers provide people with new connections to food and environment" (Respondent 1); "the municipality loves what we are doing for the city and they are well aware of the immense potential of urban farming for the environment

"we want people to learn about plants and animals so they can start taking care of it now and in the future" ; "gardening and contact with nature and learning about it, changes people mentality for the better" , "We get people the chance to grow things so they become knowledgeable [...] enriching the classroom experience through hands on learning"


ØsterGRO- urban rooftop farm, Orestrad

"close community of people living in the area, by favoring social interactions and engagement in common projects"

see my clients becoming more cohese, more patient and respectful towards one-another"; "in schools, kids learn how to work together to achieve common results, learn that we depend from one another
and need each other"

The Generational Gardens" (Generationshaverne), Valby

"kids are not used to talking to elderlies in their daily lives, but the elderlies see kids and they just want to hug them"; "this is a place where we want everybody to feel welcomed and accepted [...] our recipe is to always create a fun and friendly atmosphere"

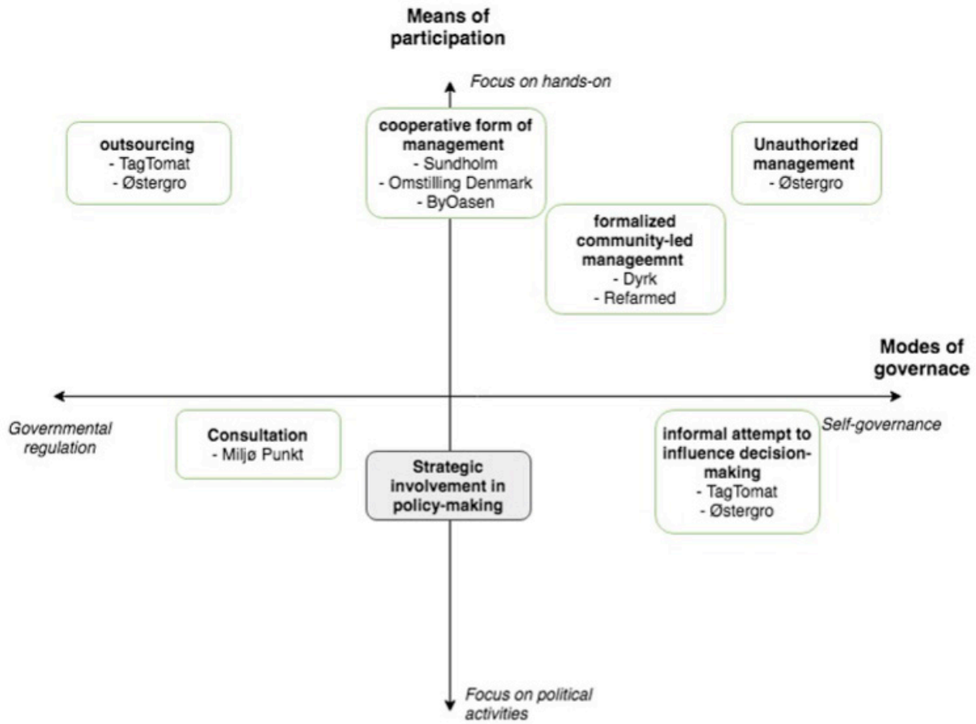
"people are tired of busy lives and to eat things that are produced God knows where, [...] through gardening they learn to develop patience and learn how to exercise care" , "a while after starting to garden in communities you realize that people want to start eating organic and enjoy living "slow""

Sydhavnen Urban Garden (Sydhavnens Haver)

Biophilic Architecture

Participatory Architecture
A balance of top-down and bottom- up architecture

As a result of the wave of liberalization that took place within the 1980s, there has been a progressive shift towards a new model, often denominated as the 'New Public Management paradigm' (Hughes, 2012). Many experts however do not actually consider it as a proper paradigm, but rather as the introduction of new principles and mechanisms of governing that supplemented and created tensions with respect to the classical system of public administration (Torfing et al, 2013:14).



Two-dimensional matrix depicting clusters of participatory govermance practices by mode of govermance and means of participation.

Biophilic Design

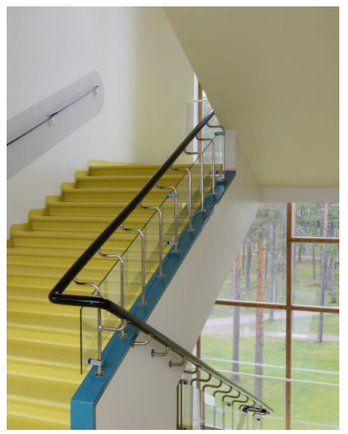
- Biophilic Design: Integrating nature into the hospital environment to reduce patient stress (e.g., Khoo Teck Puat Hospital, Singapore).
- Child-Centric and Family-Friendly Design: Customizing hospital environments to meet the unique needs of children and their families (e.g., Royal Children's Hospital, Melbourne).
- Patient-Centered Design: Creating comfortable, non-clinical spaces with elements that make patients feel more at home (e.g., Maggie's Centres).

Maggie's Centres by OMA

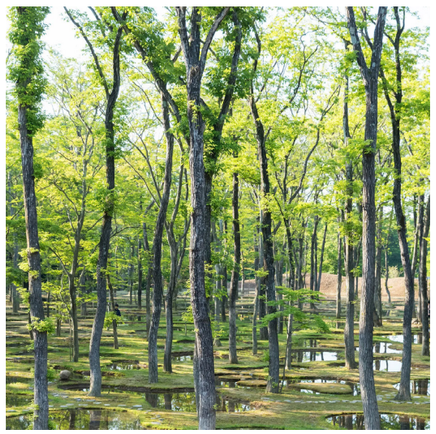
Maggie's Centres by Snohetta

Underwood Family Sonoran Landscape Laboratory

Maggie's Centres by Renzo Piano



Paimio Sanatorium by Alvar Aalto



"Architecture from Someone's Imagination is not Enough", Junya Ishigami

Designing for Biodiversity

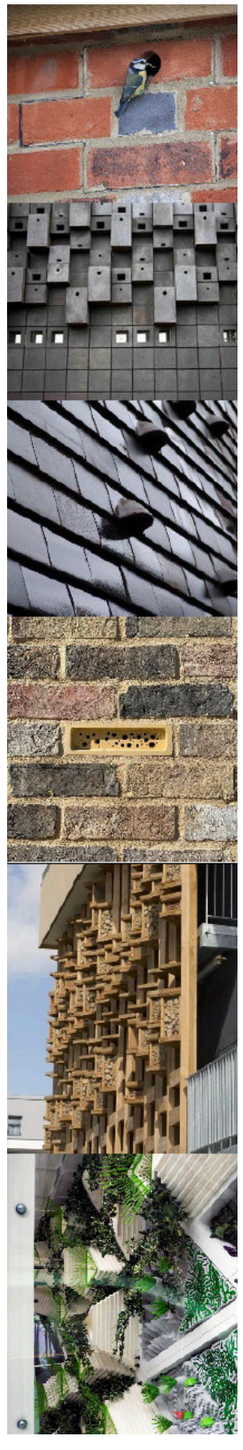
1. Cognitive Development: Enhanced Curiosity and Environmental Awareness
Biodiversity-rich environments promote curiosity, problem-solving, and environmental awareness, helping children learn about ecosystems, life cycles, and interdependencies in nature.

2. Physical Development: Gross and Fine Motor Skills through Natural Play Elements
Playing in varied natural environments enhances motor skills, coordination, and strength, as children navigate different terrains, climb, balance.

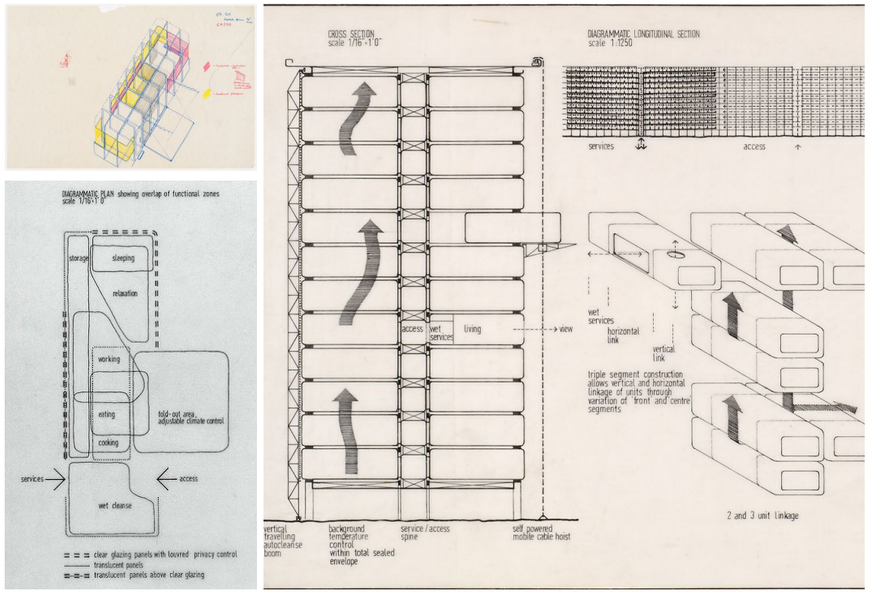
3. Social-Emotional Development: Collaboration and Empathy for Nature
Interaction with natural play spaces encourages teamwork, collaboration, and empathy for living things, fostering positive social skills and emotional resilience.

4. Sensory Stimulation: Rich Multi-Sensory Experiences
Biodiversity offers a multi-sensory experience, with different smells, textures, and sounds that enhance sensory awareness and cognitive processing.

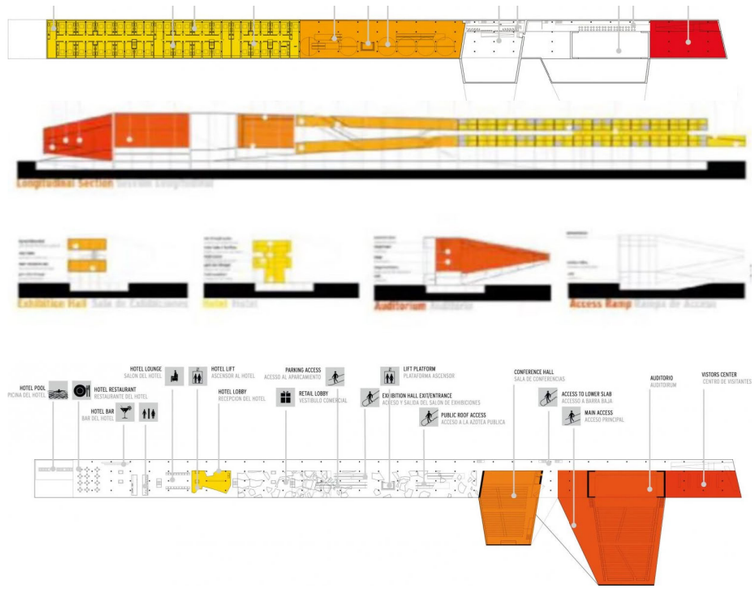
5. Creative and Problem-Solving Skills: Adaptive Play and Nature-Based Learning
Natural environments inspire imaginative play, as children use natural elements in unstructured, open-ended ways, stimulating creativity and adaptability.



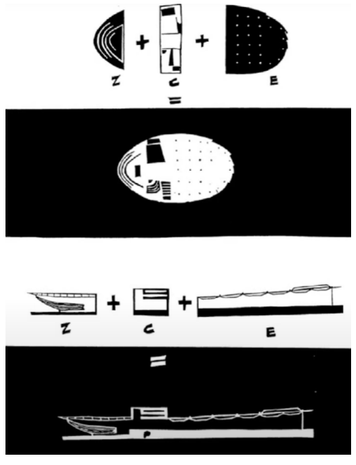
Site Perimeter as a Learning Field.
Architecture as a Social Instrument and the Third Teacher



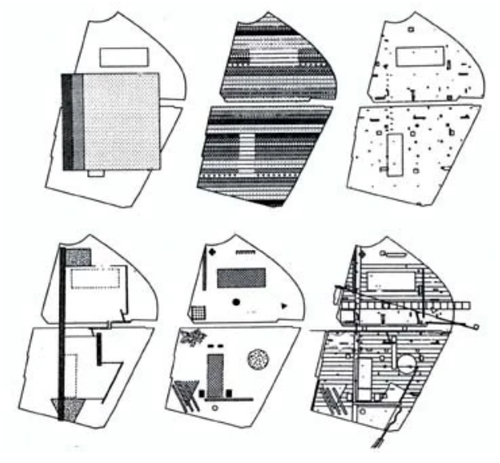
Potteries Thinkbelt, Cedric Price



Cordoba Congress Center, Rem Koolhaas



Parc de la Villette, OMA



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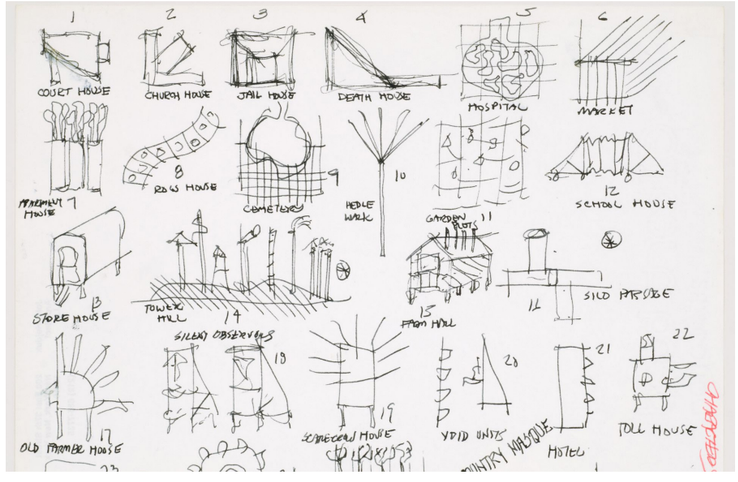

John Hejduk, Masque

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Library-City, a place to nurture, play and learn

The Architecture

L, M, S, XS

Ferrari (Tzu-Shou) Huang

L- the site

M - the typologies “environment is the third teacher”

S- inbetween spaces

XS - biodiversity tracking prototype

Site Perimeter

Barriers become the seedbeds of innovation

Maskinhallen

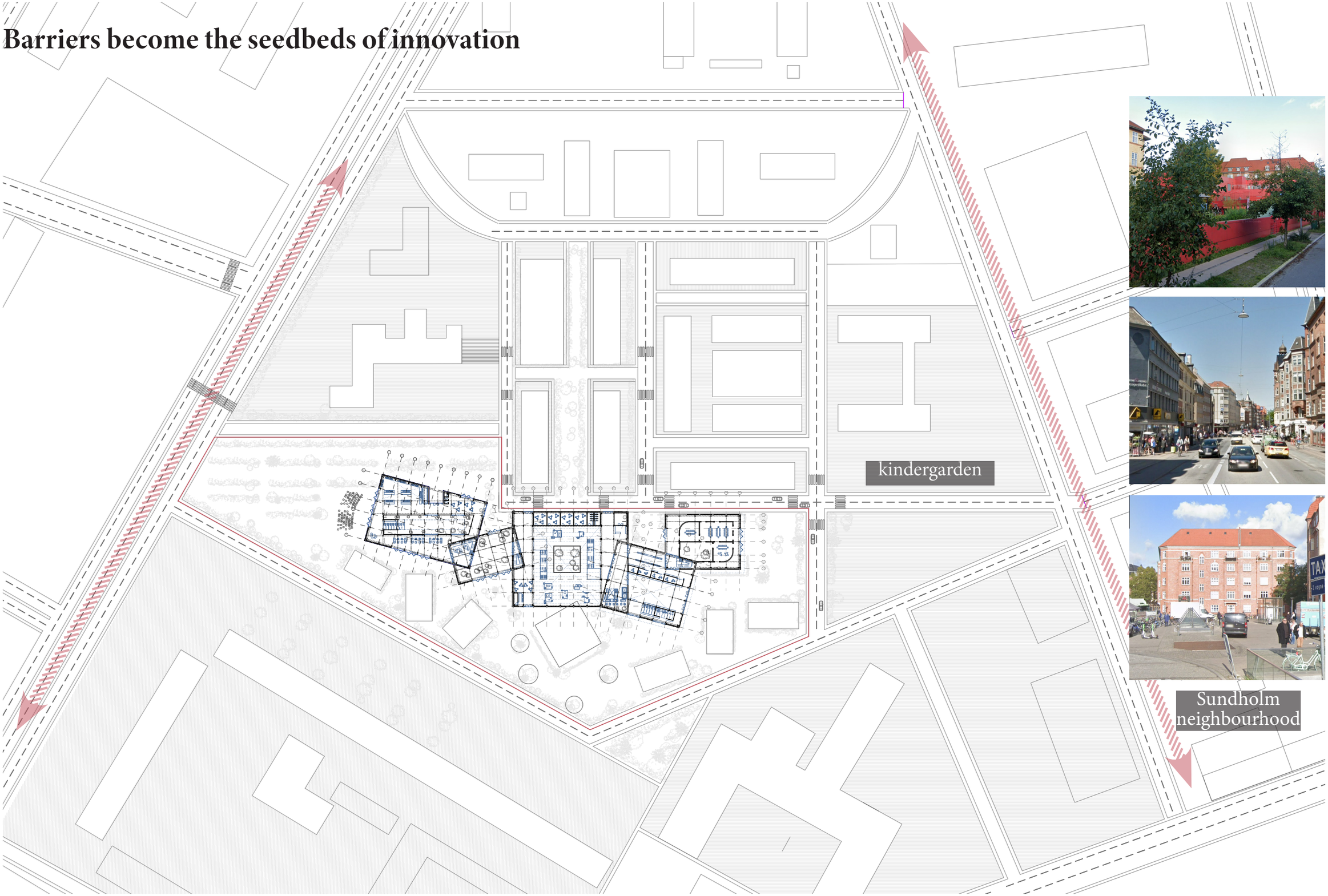
juvenile

special need school

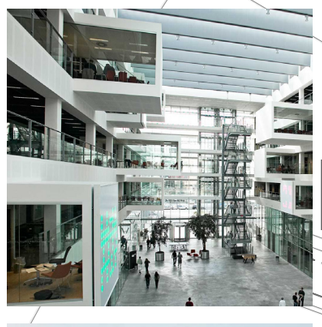
social housing

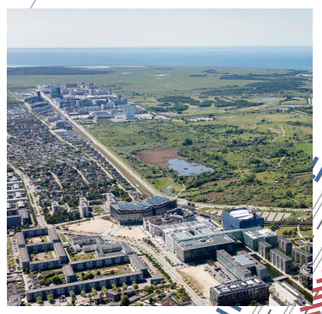
Ferrari (Tzu-Shou) Huang

Barriers become the seedbeds of innovation



The Public Condenser becomes a bridge





University students

Amager Fælled

Ferrari (Tzu-Shou) Huang

Who is the Public Condenser For?

Nature — as a medium to connect people. through ecological presence, the space fosters human connection, reflection, and care.

The Framework Setters

"those who govern and guide"- Policy makers, organizers, and institutional stewards who shape the possibilities of the site.

Municipality
NGOs & Startups
Copenhagen Administration

The Margins

"Voices Often Unheard"- Homeless or precarious individuals. People facing systemic neglect — central to your social justice mission.

Isolated children
Mentally ill parents
Underserved Sundholm residents

Nature Inclusive

"More-than-Human Stakeholders"- The non-human life that shares, shapes, and is sustained by the space.

Insects, birds, bats, pollinators
Urban farms, guano systems, biodiversity labs.

The Everyday Public

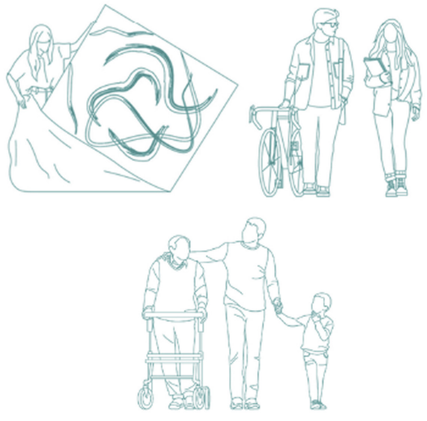
"The City's Pulse" - the diverse and dynamic flow of people who activate the space daily — from inquiry to casual use.

Citizens of Copenhagen
Local researchers, ecologists
Migrants, visitors, students

The Cultural Weavers

"Those Who Hold, Heal, and Translate"- The mediators and caretakers who foster relationships, rituals, and resilience across boundaries.

Artists, performers
Maintenance workers
Therapists, educators, social workers



Our Stories begins with a *Seed*
Library-City, a place to nurture, play and learn

The Architecture
Form Generation

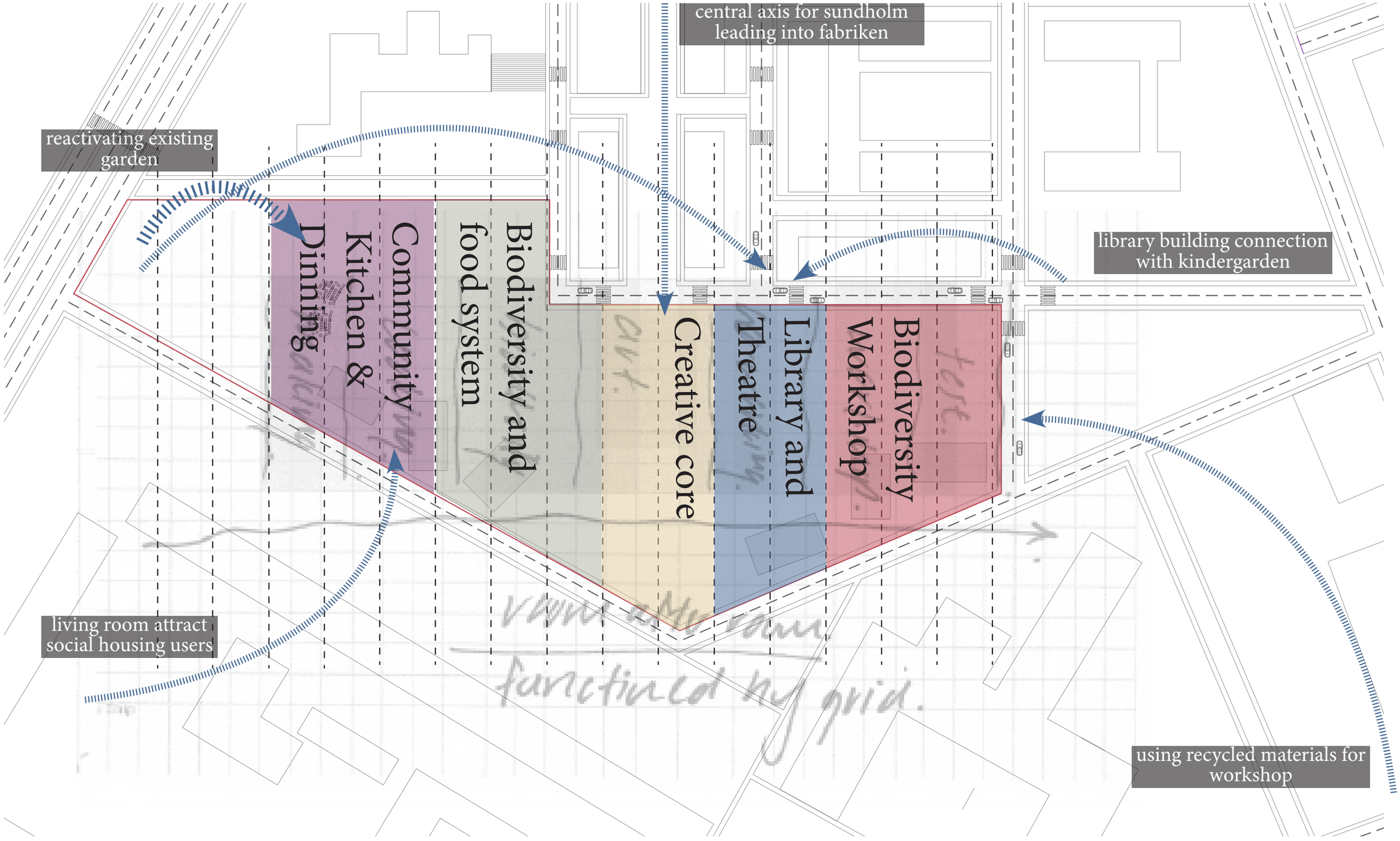
Ferrari (Tzu-Shou) Huang

Form Generation process 1

The Fabrikken reborn: where industrial memory meets present-day purpose.

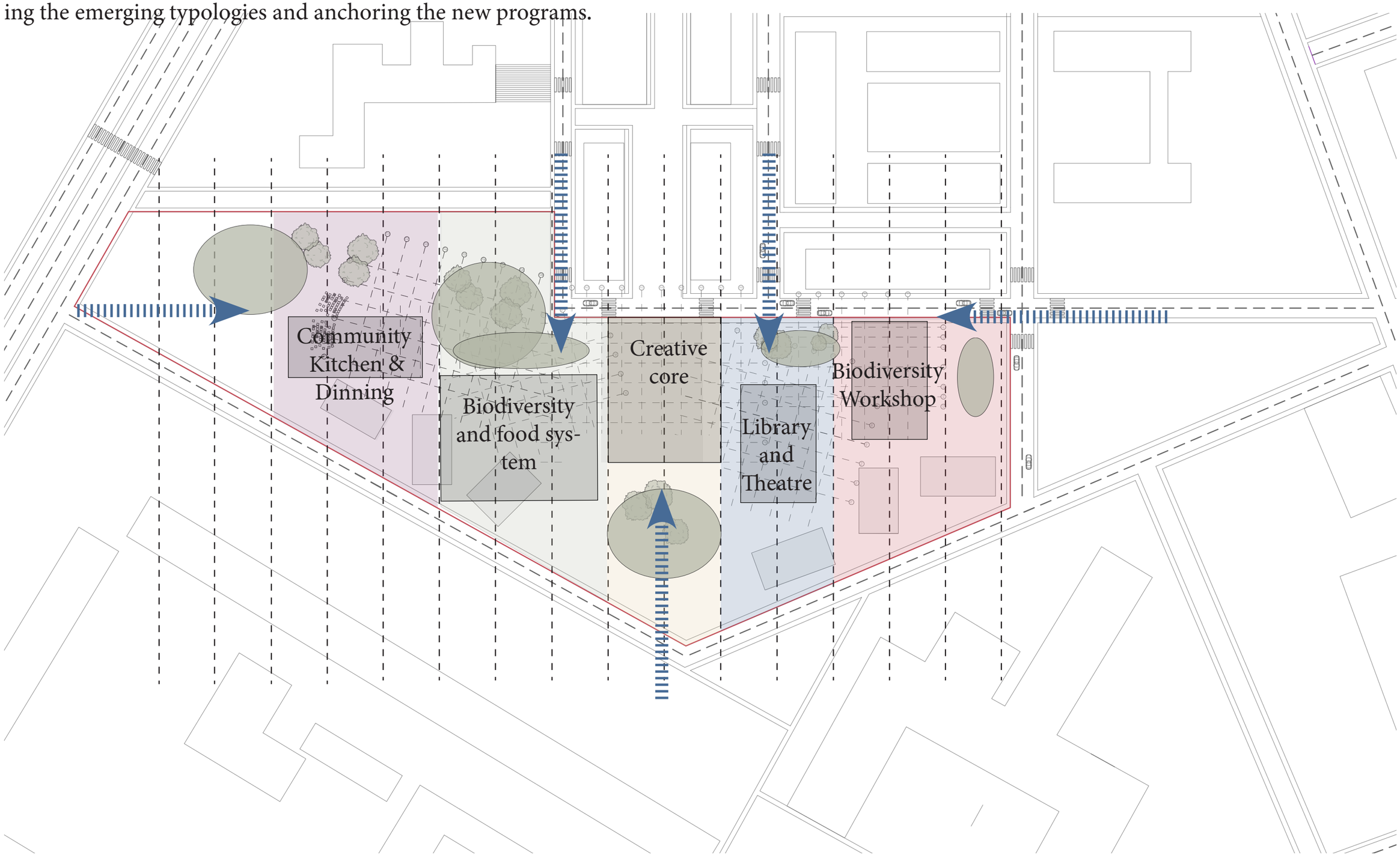
Form Generation process 2

The Strip Strategy – A linear organization dividing the triangular site into parallel bands, each dedicated to distinct functions.



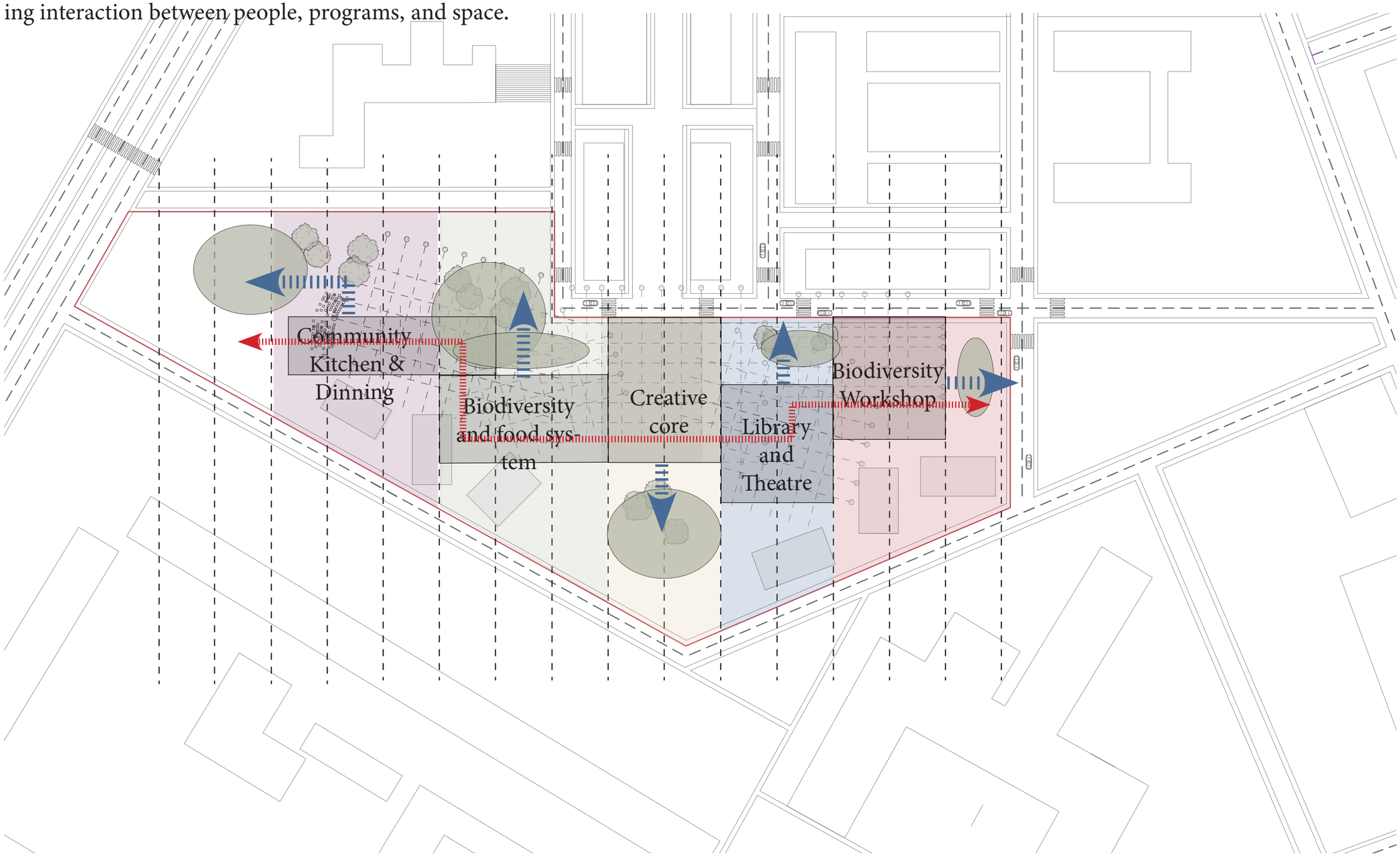
Form Generation process 3

Establishing Entrances and Courtyards- Pimary access points and courtyards are defined to guide movement and create moments of pause—framing the emerging typologies and anchoring the new programs.



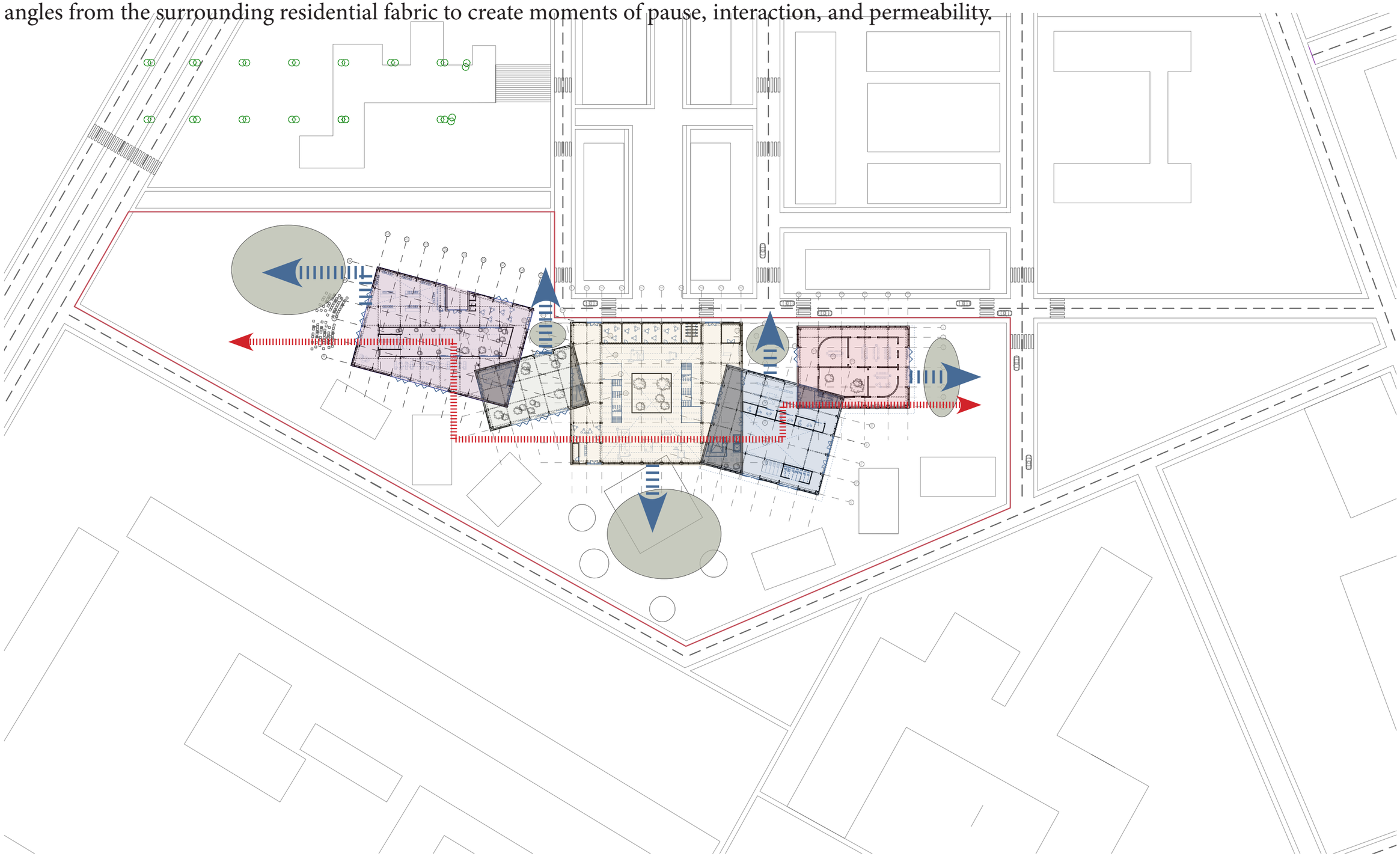
Form Generation process 4

No Hallways? Instead of traditional corridors, the design offers an immersive spatial experience—encouraging hands-on engagement and maximizing interaction between people, programs, and space.



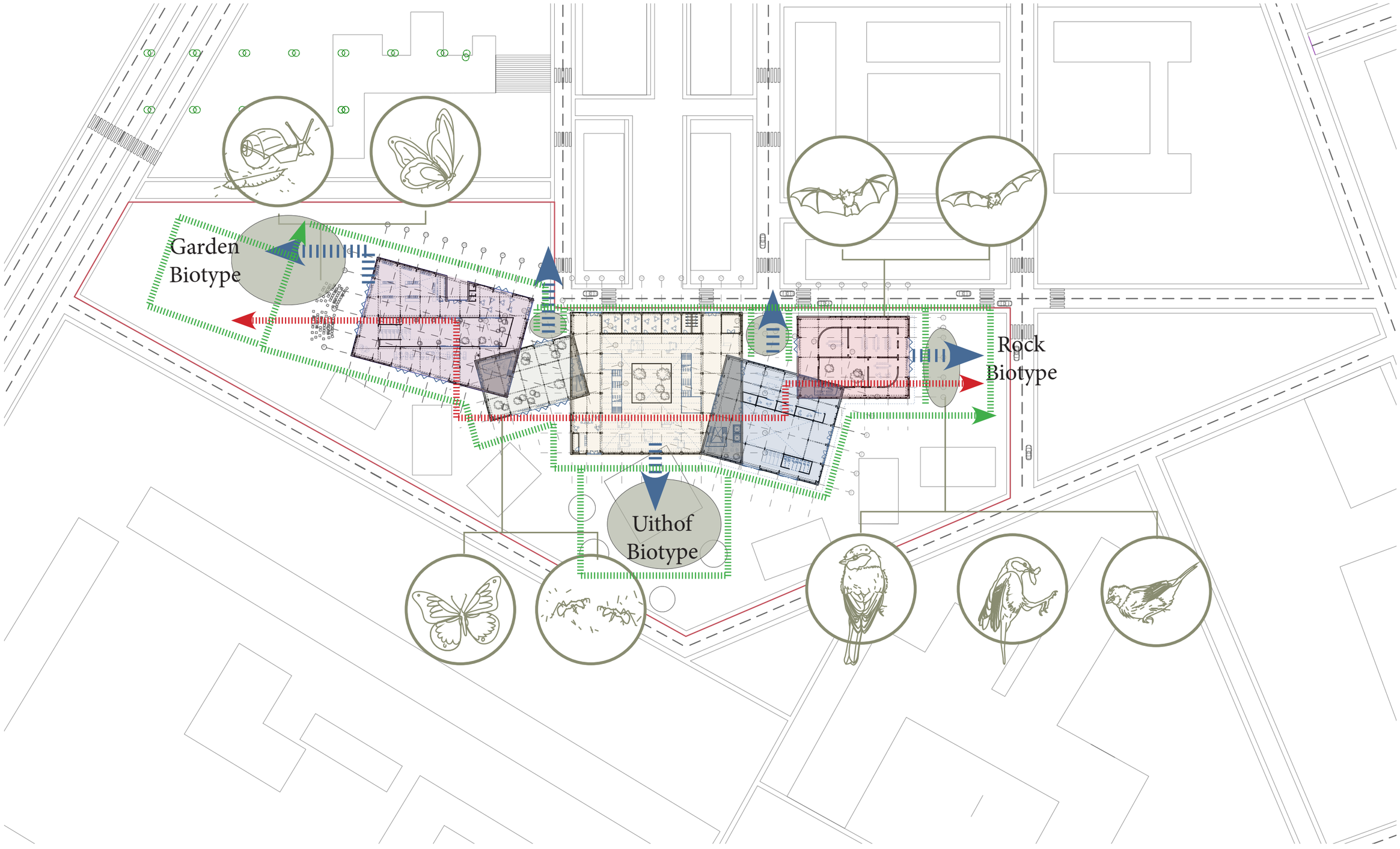
Form Generation process 5

Breathing Spaces- Transitional zones shaped through spatial dialogue. These in-between spaces emerge by twisting the building form—drawing angles from the surrounding residential fabric to create moments of pause, interaction, and permeability.



Form Generation process 6

Animal-inclusive design responds to diverse microclimates, tailoring spaces to the specific needs and biotypes of each species



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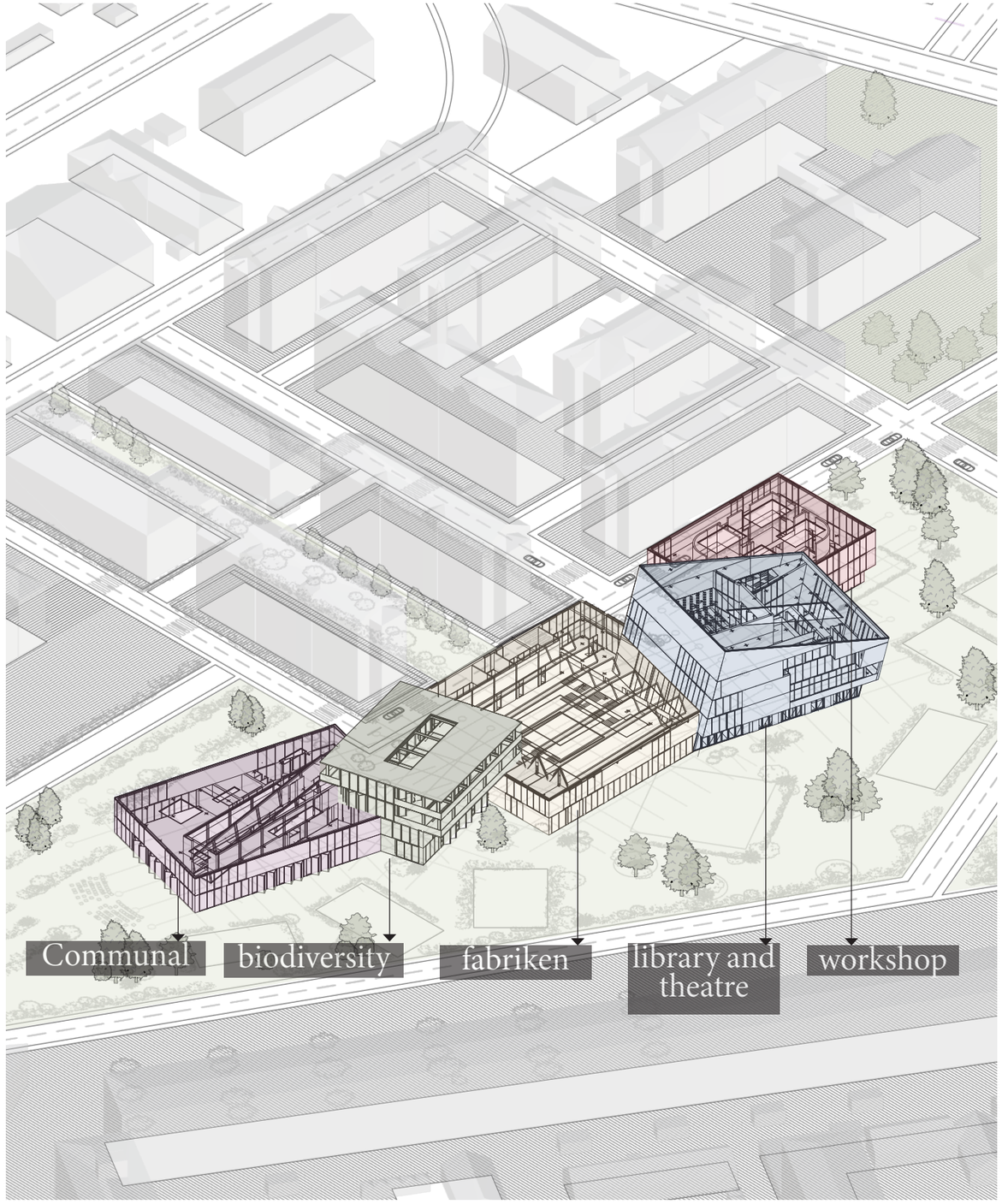
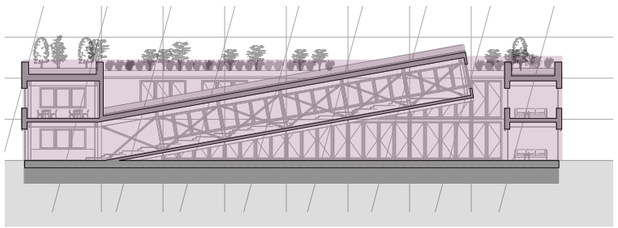
Ferrari (Tzu-Shou) Huang

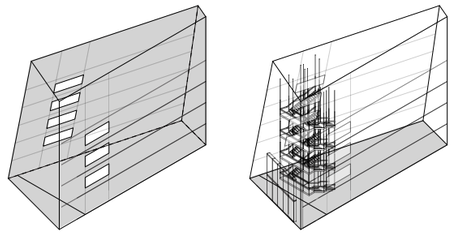
Programme & circulation

Typologies- “Environment as a third teacher”



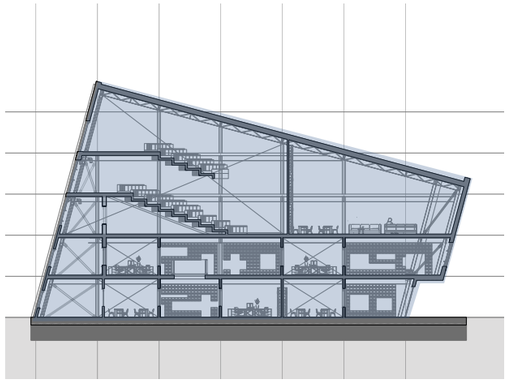


The Communal

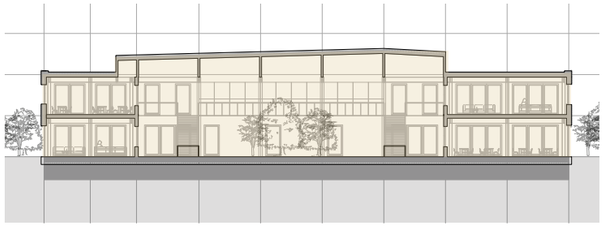


Inbetween Breathing Space

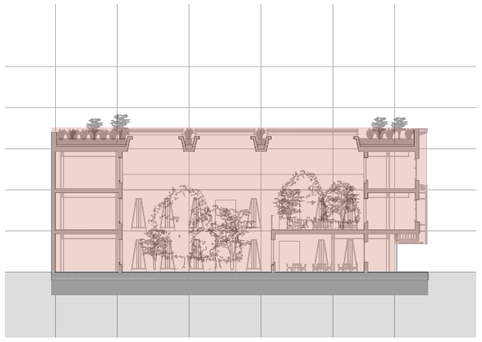
The Biodiversity Tower



Library and Theatre



The Fabriken



Workshop

Users and programme relationship

The Framework Setters

Municipality
NGOs & Startups
Copenhagen Administration

The Margins

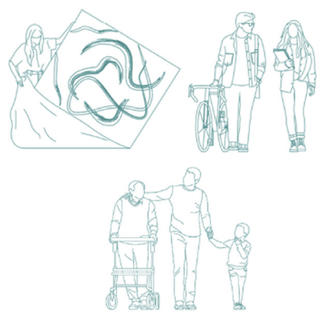
Isolated children
Mentally ill parents
Underserved Sundholm residents

The Everyday Public

Citizens of Copenhagen
Local researchers, ecologists
Migrants, visitors, students

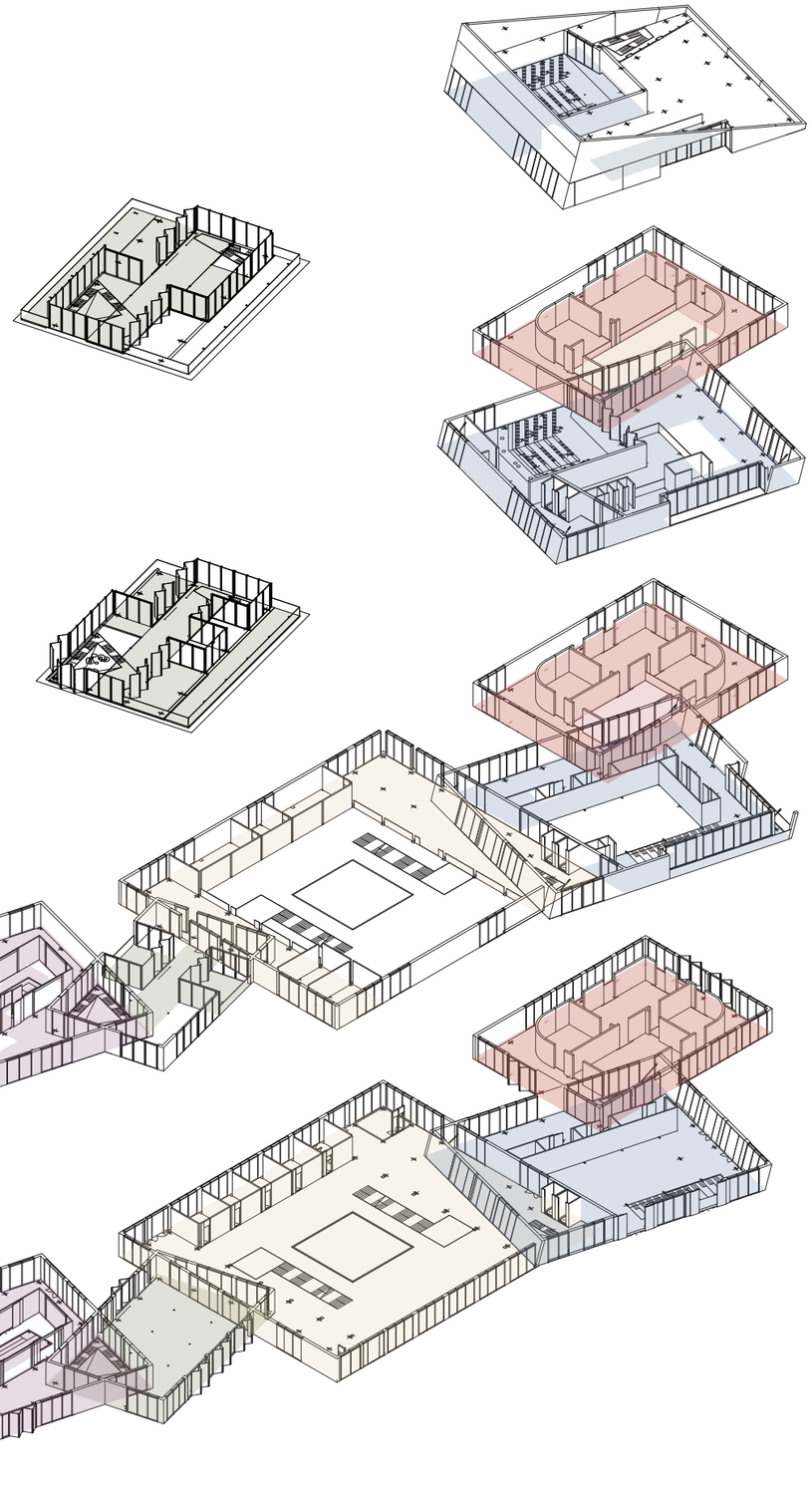
The Cultural Weavers

Artists, performers
Maintenance workers
Therapists, educators, social workers

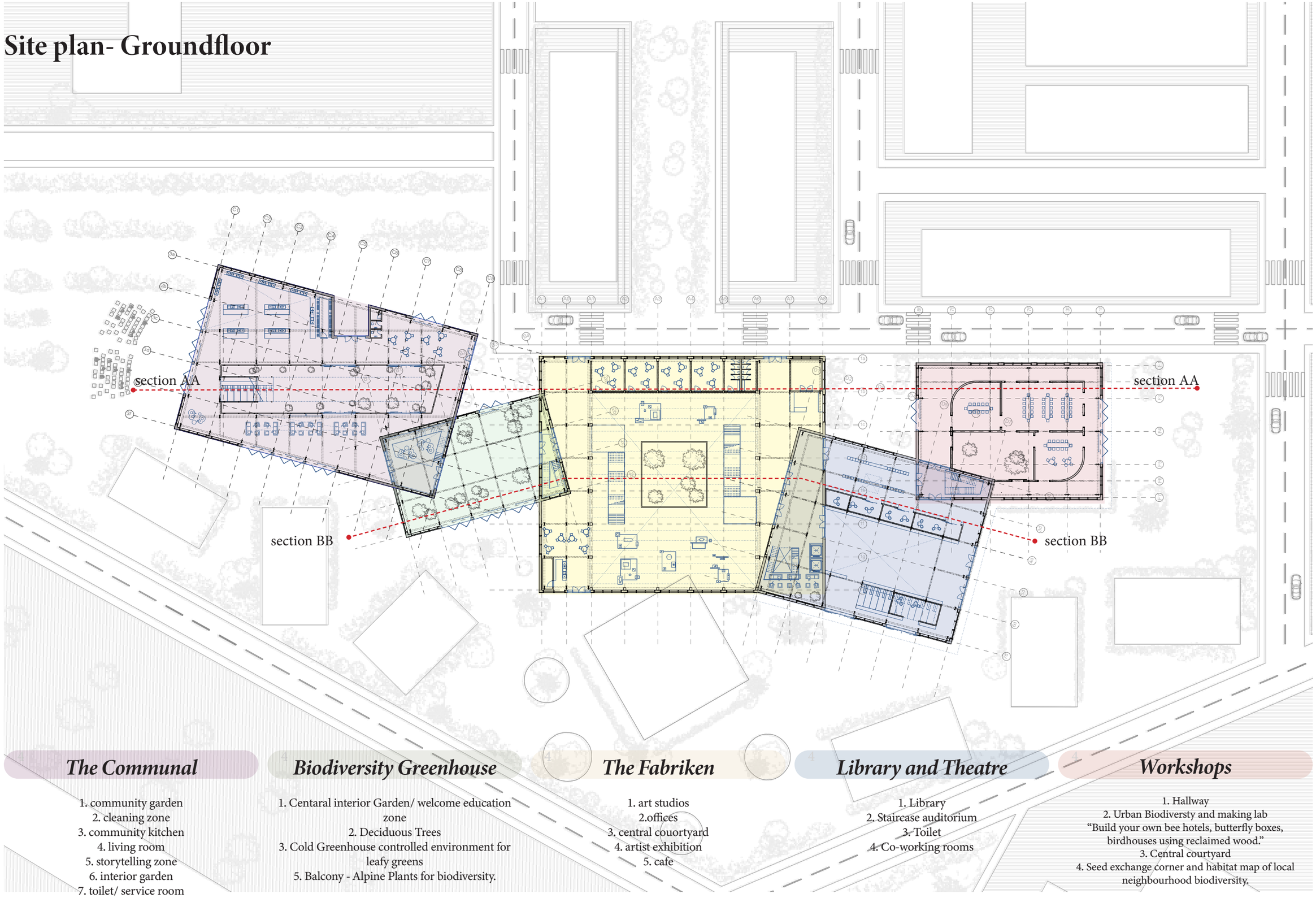


Nature Inclusive

Insects, birds, bats, pollinators Urban farms, guano systems, biodiversity labs.



Site plan- Groundfloor



The Communal

1. community garden
2. cleaning zone
3. community kitchen
4. living room
5. storytelling zone
6. interior garden
7. toilet/ service room

Biodiversity Greenhouse

1. Centaral interior Garden/ welcome education zone
2. Deciduous Trees
3. Cold Greenhouse controlled environment for leafy greens
5. Balcony - Alpine Plants for biodiversity.

The Fabriken

1. art studios
2.offices
3. central couortyard
4. artist exhibition
5. cafe

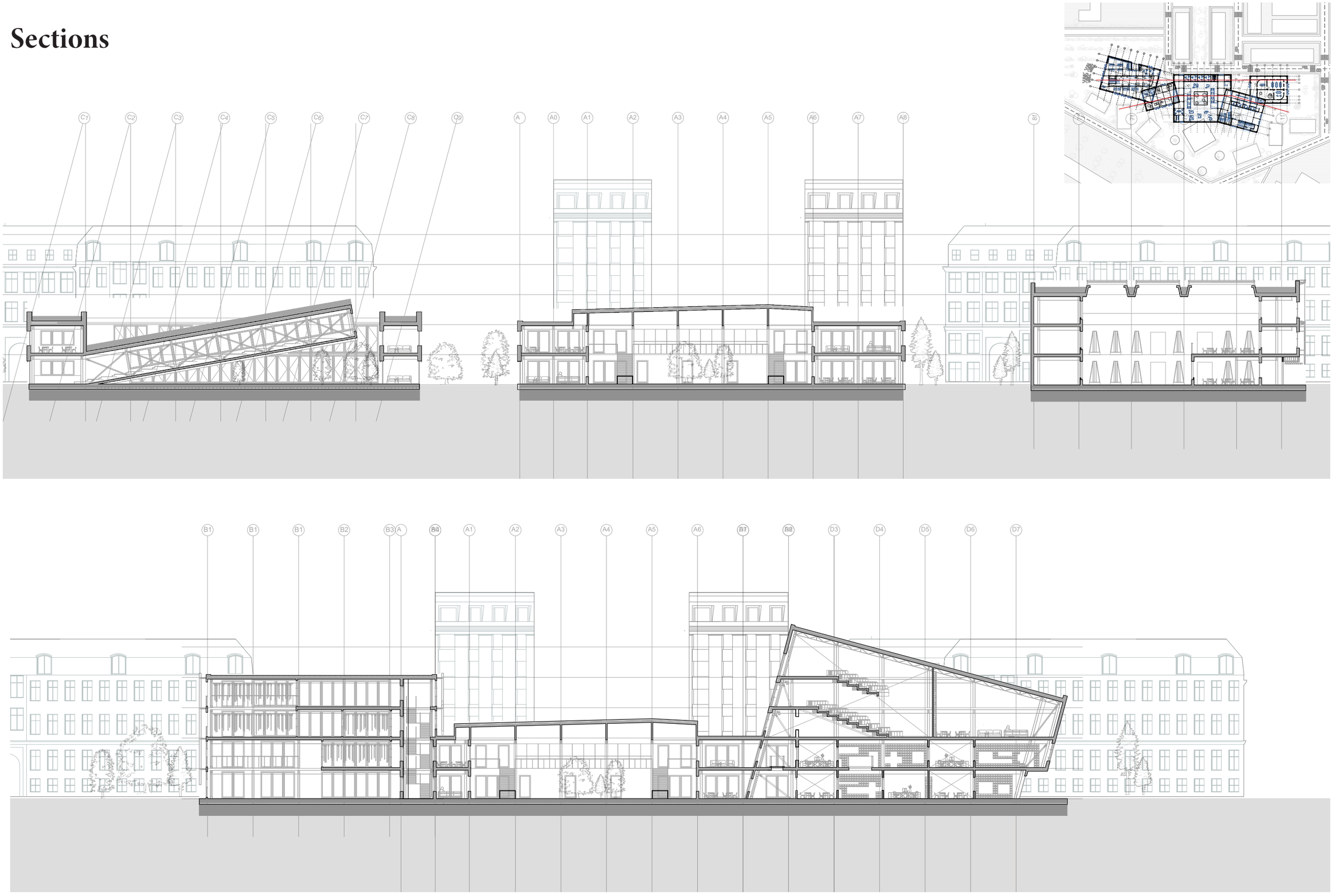
Library and Theatre

1. Library
2. Staircase auditorium
3. Toilet
4. Co-working rooms

Workshops

1. Hallway
2. Urban Biodiversty and making lab
"Build your own bee hotels, butterfly boxes, birdhouses using reclaimed wood."
3. Central courtyard
4. Seed exchange corner and habitat map of local neighbourhood biodiversity.

Sections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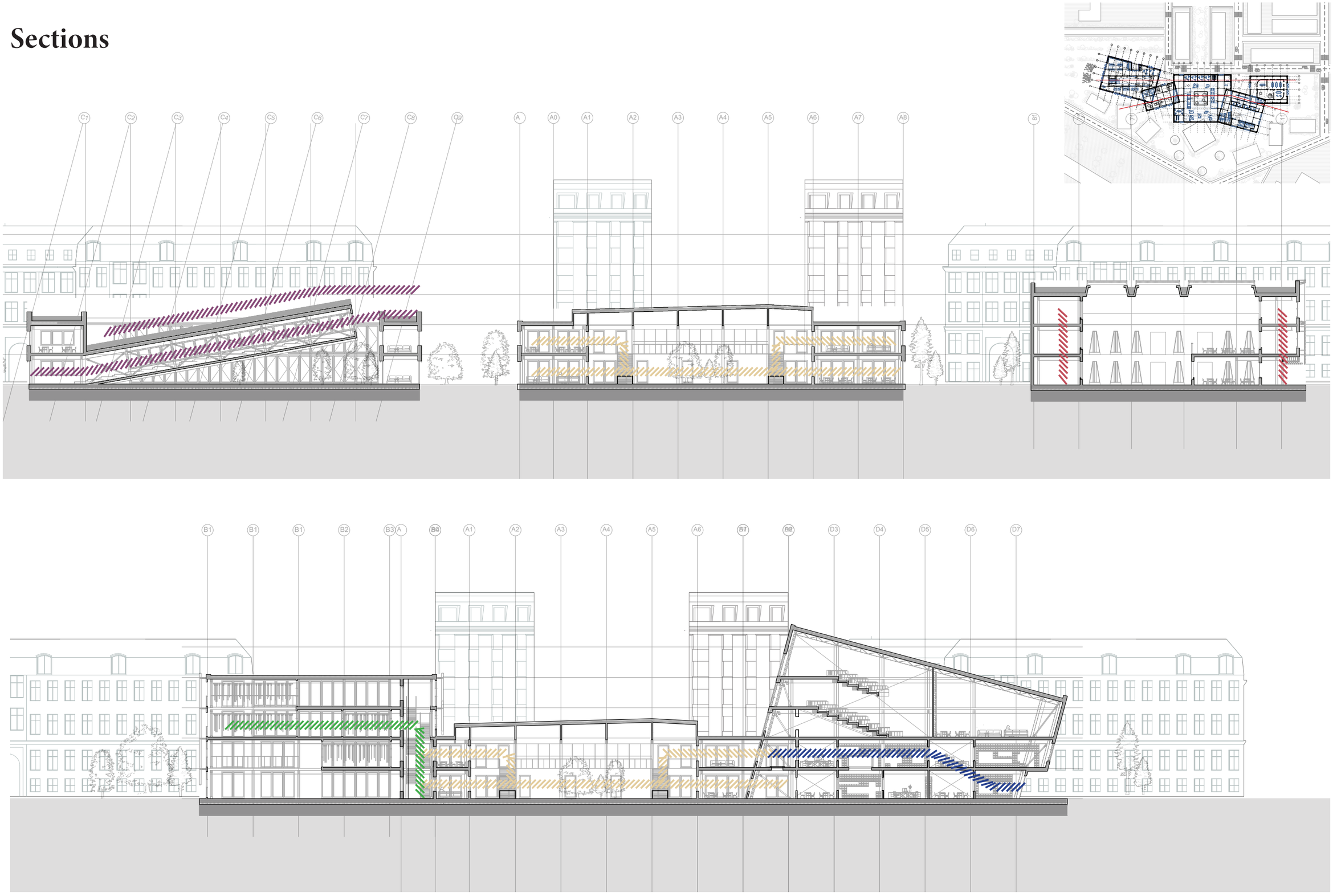
Sections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Library-City, a place to nurture, play and learn

Architecture as social instruments

unfolding the journey and moments...

Ferrari (Tzu-Shou) Huang

d learn

Ferrari (Tzu-Shou) Huang

Ferrari (Tzu-Shou) Huang

Learn

Ferrari (Tzu-Shou) Huang

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Ferrari (Tzu-Shou) Huang

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Ferrari (Tzu-Shou) Huang

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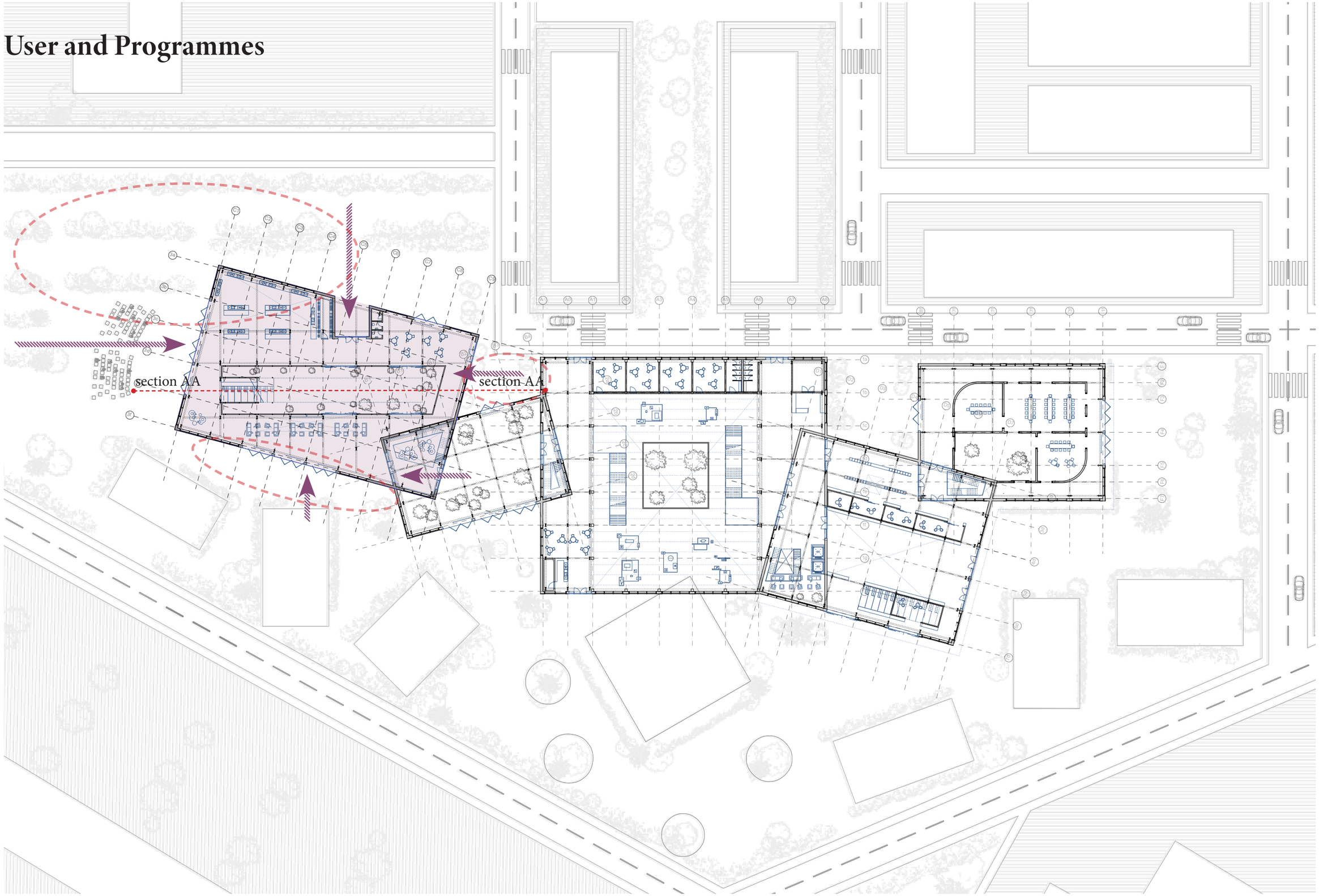
Architecture as Social Instruments

Community Typology

Ferrari (Tzu-Shou) Huang

User and Programmes



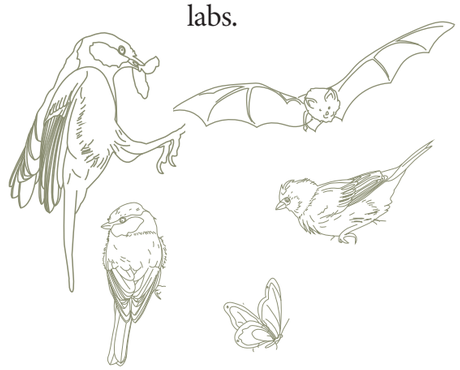
User and Programmes

The Margins

Isolated children
Mentally ill parents
Underserved Sundholm residents

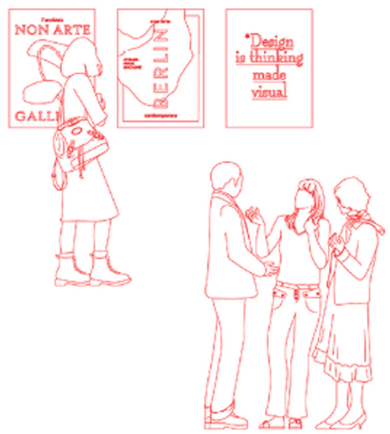
Nature Inclusive

Insects, birds, bats, pollinators Urban farms, guano systems, biodiversity labs.



The Everyday Public

Citizens of Copenhagen
Local researchers, ecologists
Migrants, visitors, students

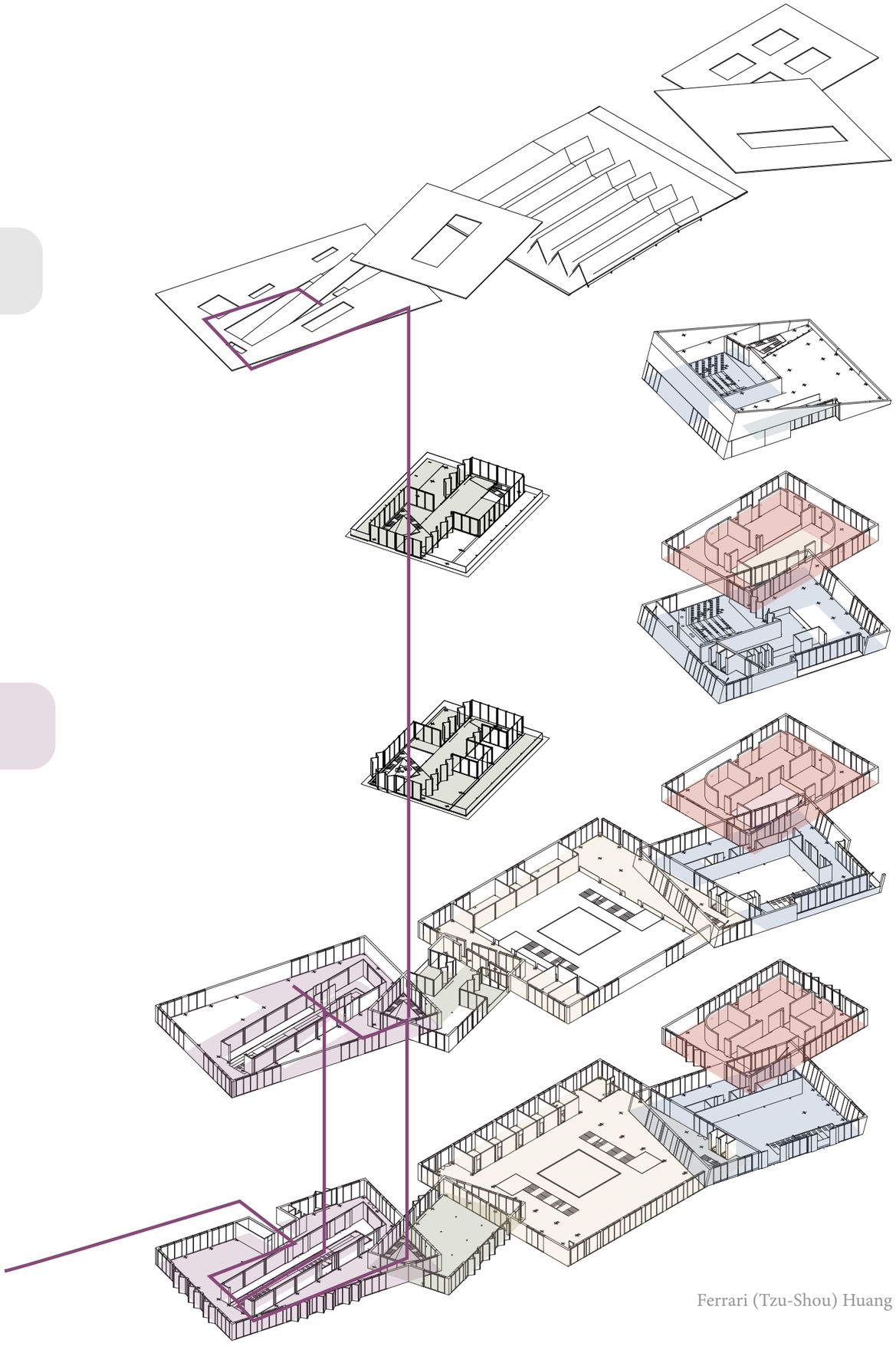


The Communal

Ground floor:
1. community garden
2. cleaning zone
3. community kitchen
4. living room
5. storytelling zone
6. interior garden
7. toilet/ service room

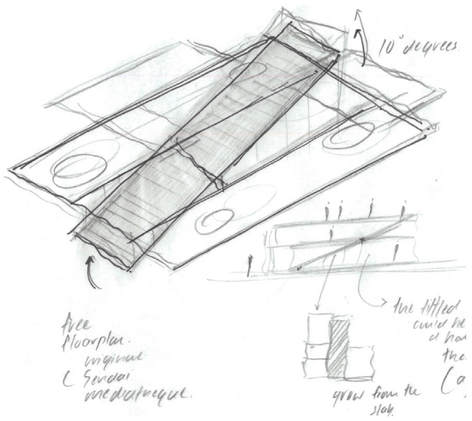
First floor:
1. communal dinning
2. living room
3. toilet / service room

Rooftop :
1. Roof Garden
2. Theatre in garden



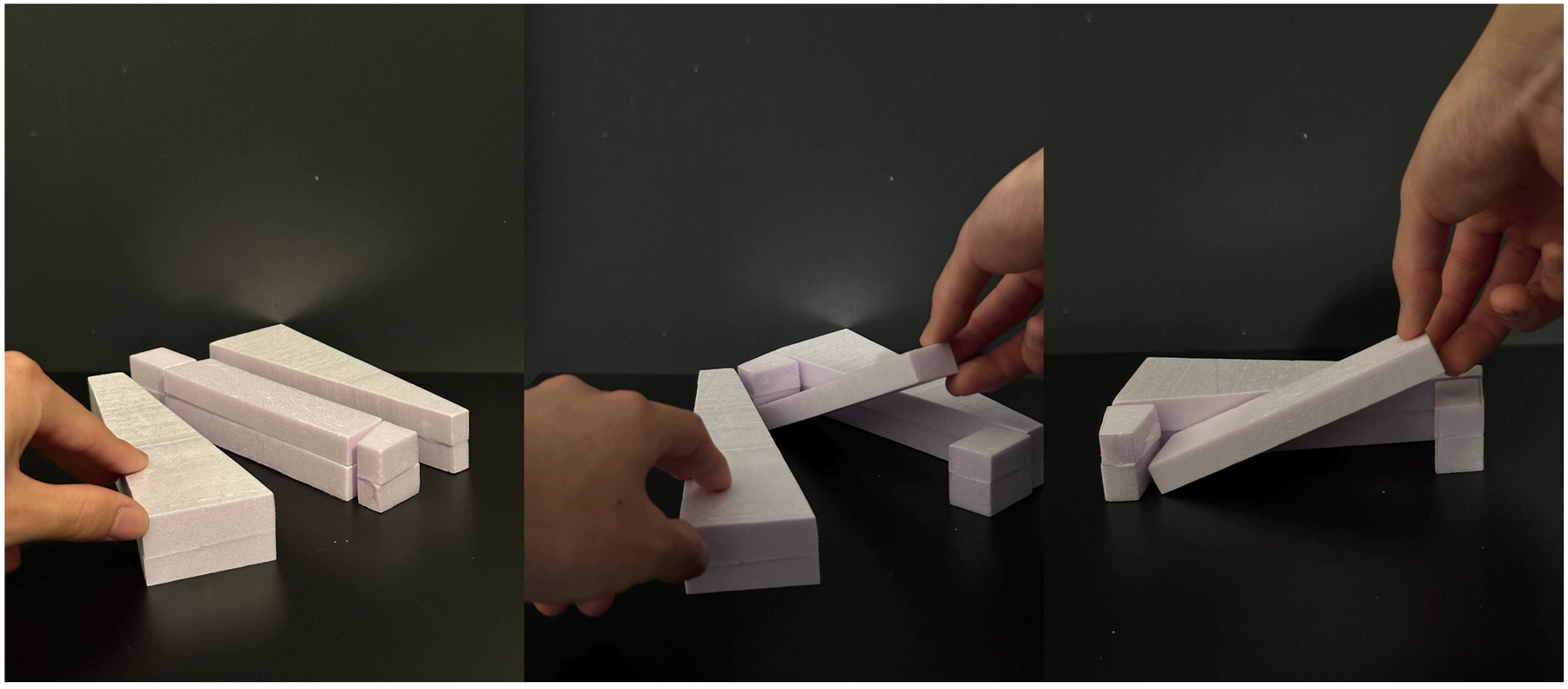
Ferrari (Tzu-Shou) Huang

Design Process

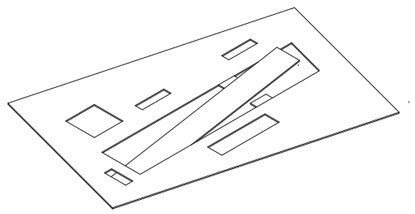


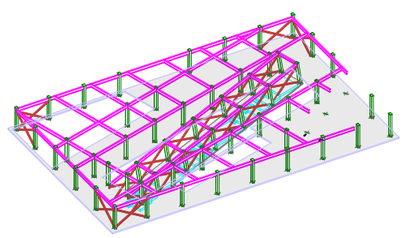
Fragmented Free Plan

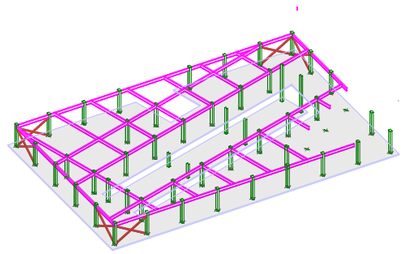
A building divided, not broken—three volumes, autonomous yet interlinked. One tilts off-axis, introducing controlled dissonance. The central core anchors structure and circulation. Flanking slabs extend outward, suspended rather than stacked. Their outward push creates programmatic spillover. Boundaries dissolve. Zones blur.



Section

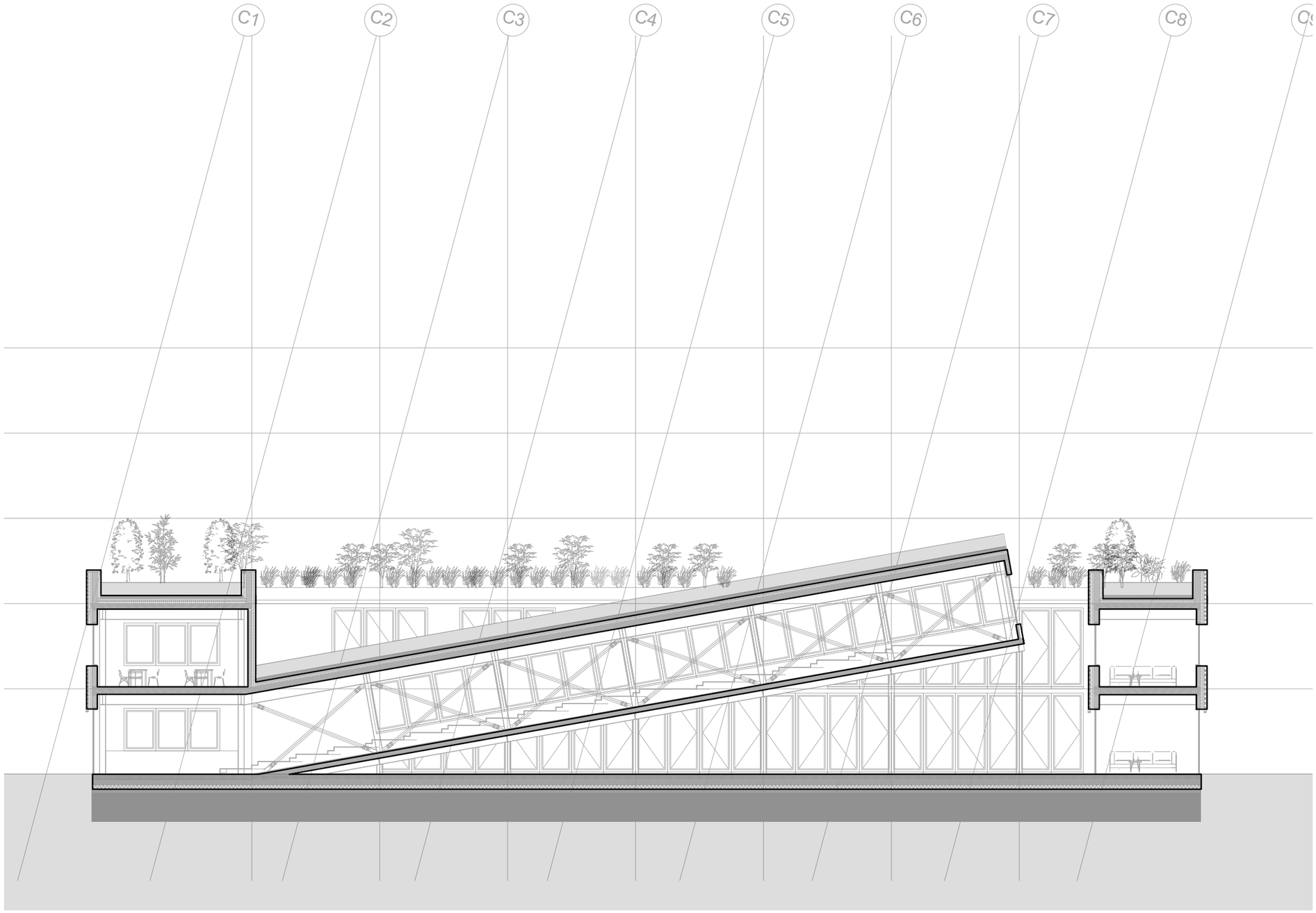






Section View Description:

The steel-framed structure features cross bracing for the tilted central slab, which serves as a space for theatre and storytelling. Below, a garden offers an open, natural area for children to explore freely. Embracing circular economy principles, the garden produces crops for the cleaning zone and kitchen, nourished by composted food waste from the dining area. A green roof collects rainwater for reuse, while pollinator gardens and biodiversity habitats support local ecosystems. Cross ventilation from the southwest expels kitchen odors, promoting a healthy indoor environment.



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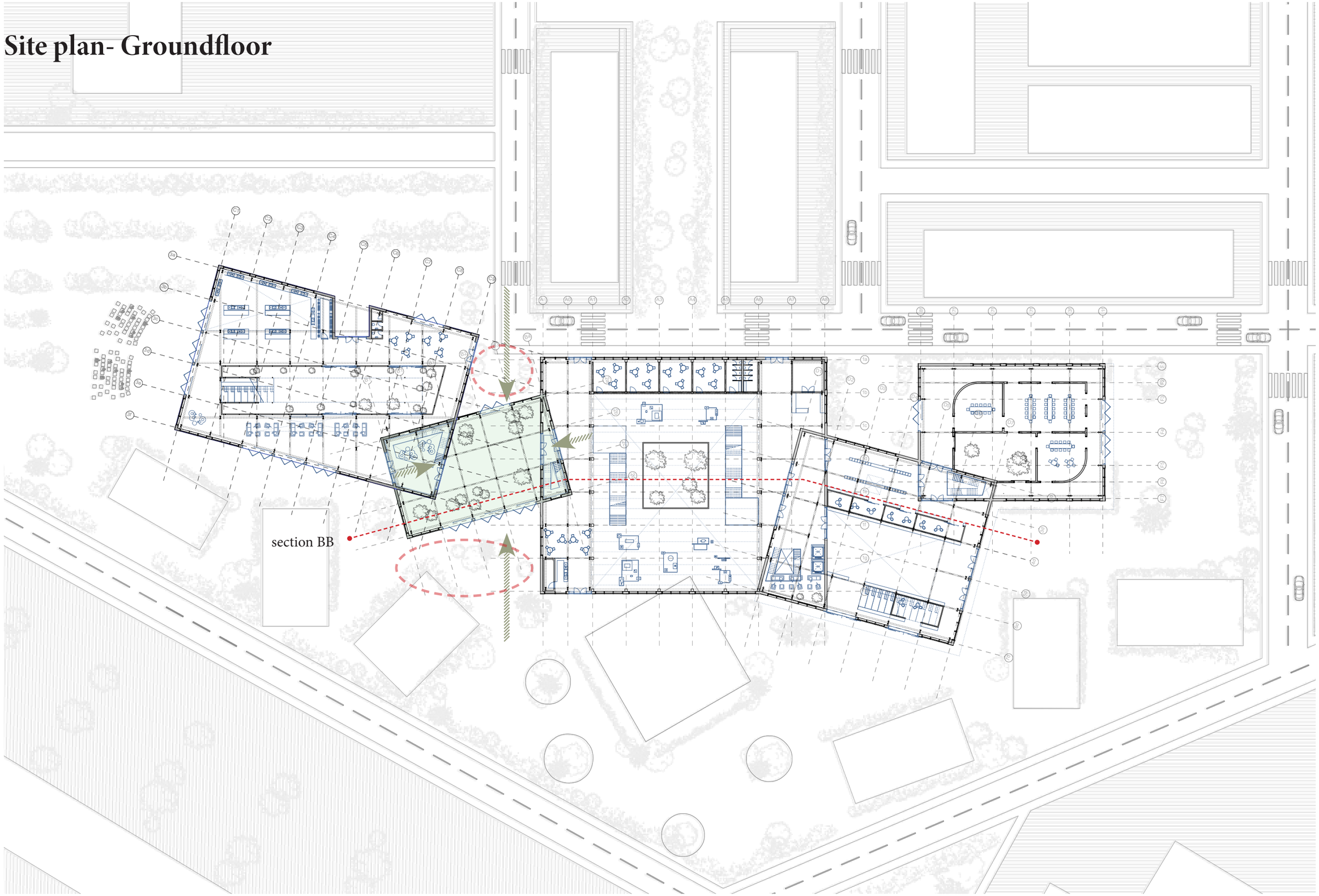
Architecture as Social Instruments

Vertical Ecology

Site plan- Groundfloor



User and Programmes

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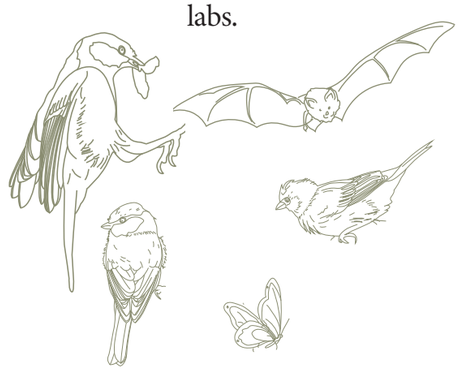
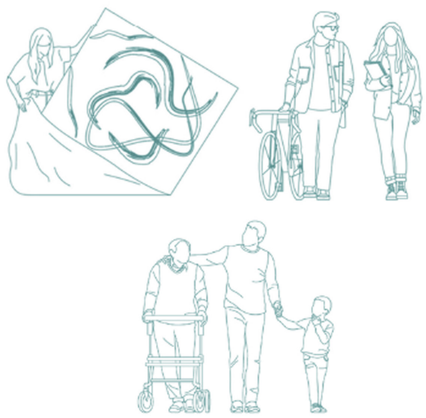


The Cultural Weavers

"Those Who Hold, Heal, and Translate"- The mediators and caretakers who foster relationships, rituals, and resilience across boundaries.

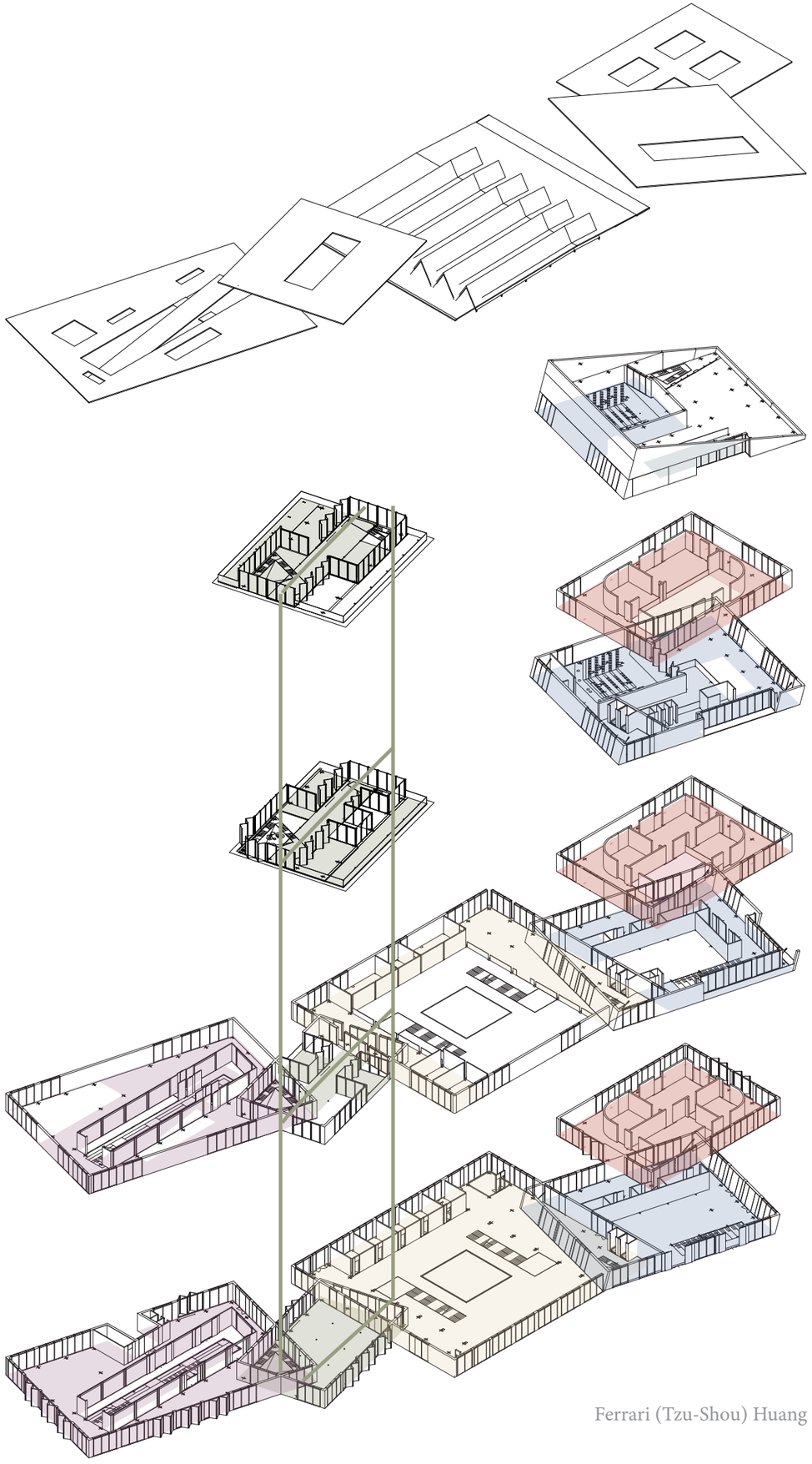
Artists, performers
Maintenance workers
Therapists, educators, social workers



Biodiversity Greenhouse

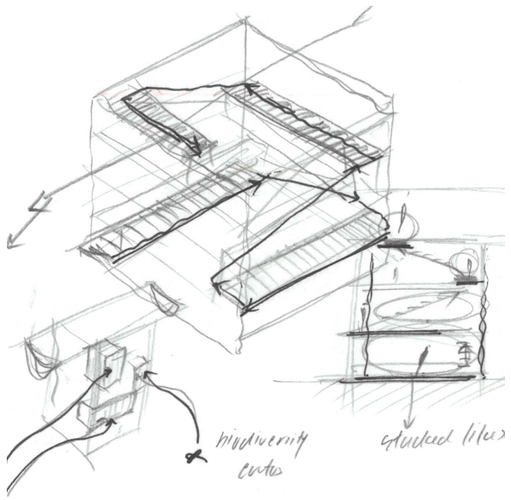
Ground and first floor:
1. Centaral interior Garden/ welcome education zone
2. Deciduous Trees
3. Cold Greenhouse controlled environment for leafy greens
5. Balcony - Alpine Plants for biodiversity.

Second and third floor:
1. Warm greenhouse, tropical zone
1. Butterfly habitat with plants for nectar, larvae, and shelter



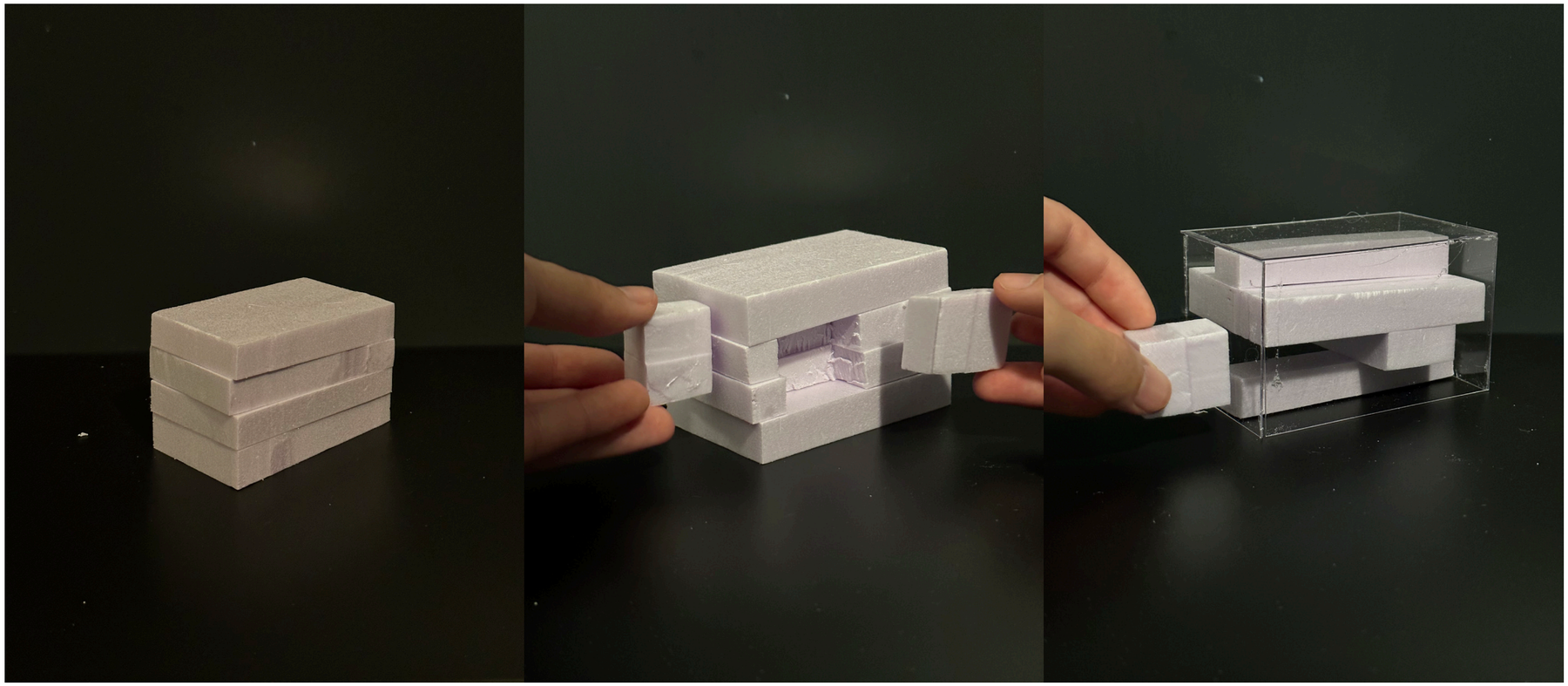
Ferrari (Tzu-Shou) Huang

Design Process

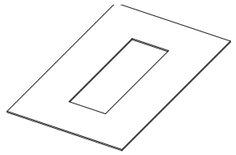


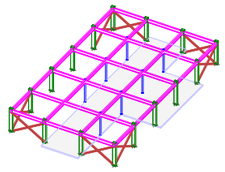
Vertical Ecology

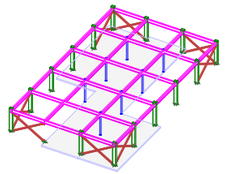
A tower of shifting volumes—stacked, offset, irregular. Each hosts a distinct biotype, forming layered ecosystems in section. Microclimates evolve vertically. At the center, a stair spine connects habitats—movement becomes gradient. Architecture frames biodiversity. The building is not singular, but ecological strata in tension.

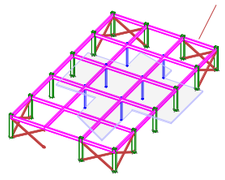


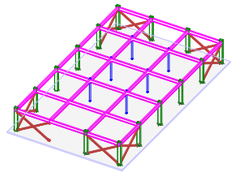
Section











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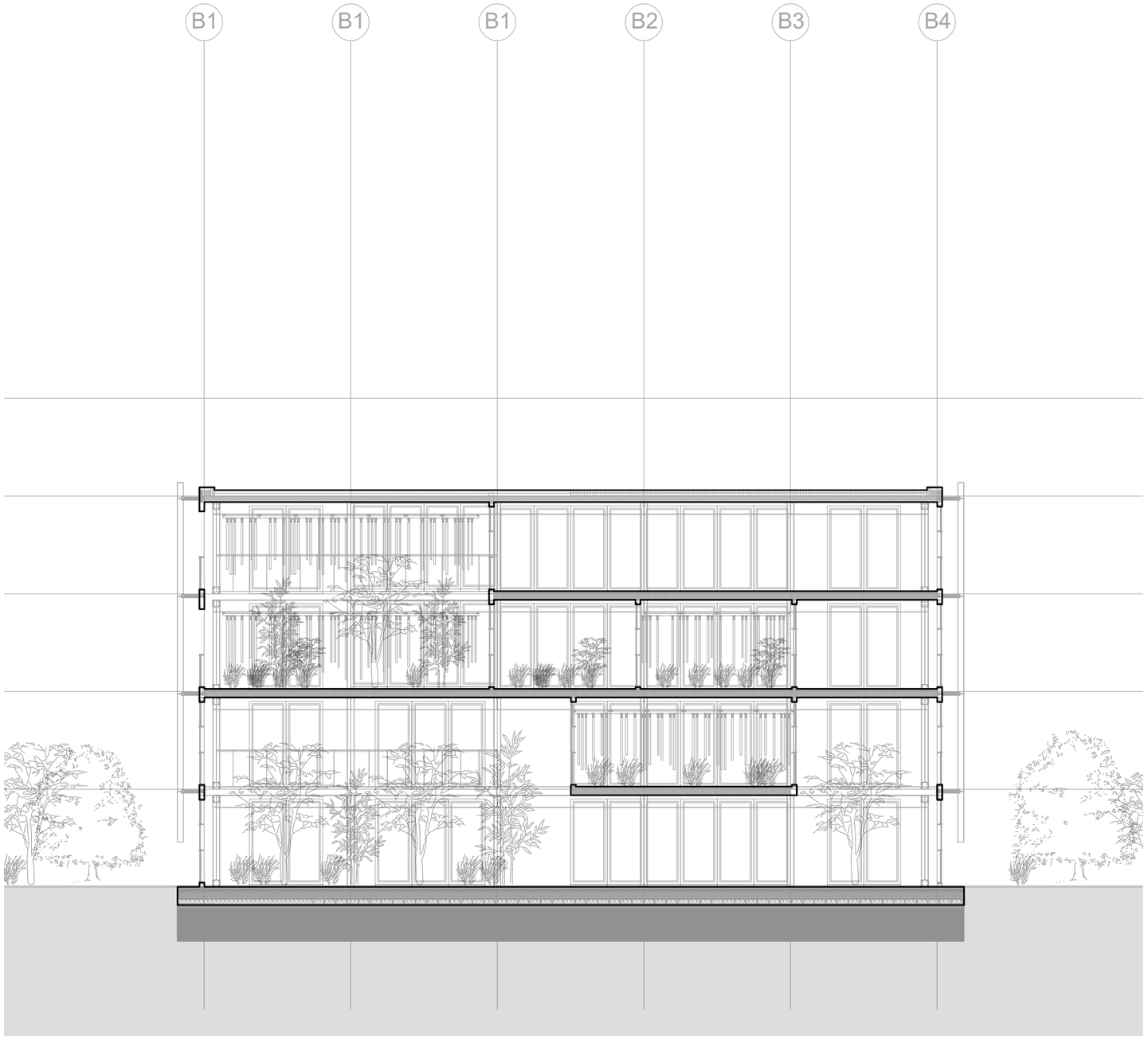

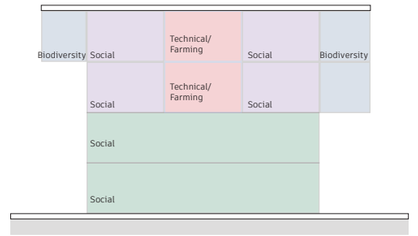

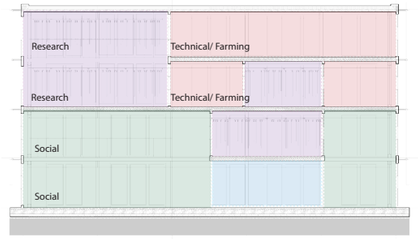

Hot greenhouse - 23-25oC - natural L

Controlled - 20-23oC

Warm gerenhouse 20-oC- natural

Animal Aided Balcony for Pollinators

Circular Economy

A vertically zoned greenhouse structure with a community-focused, climate-controlled space at the base for social programs and public engagement. The upper levels feature hotter, more technical greenhouse environments dedicated to research, including experimental work on animal-aided design.

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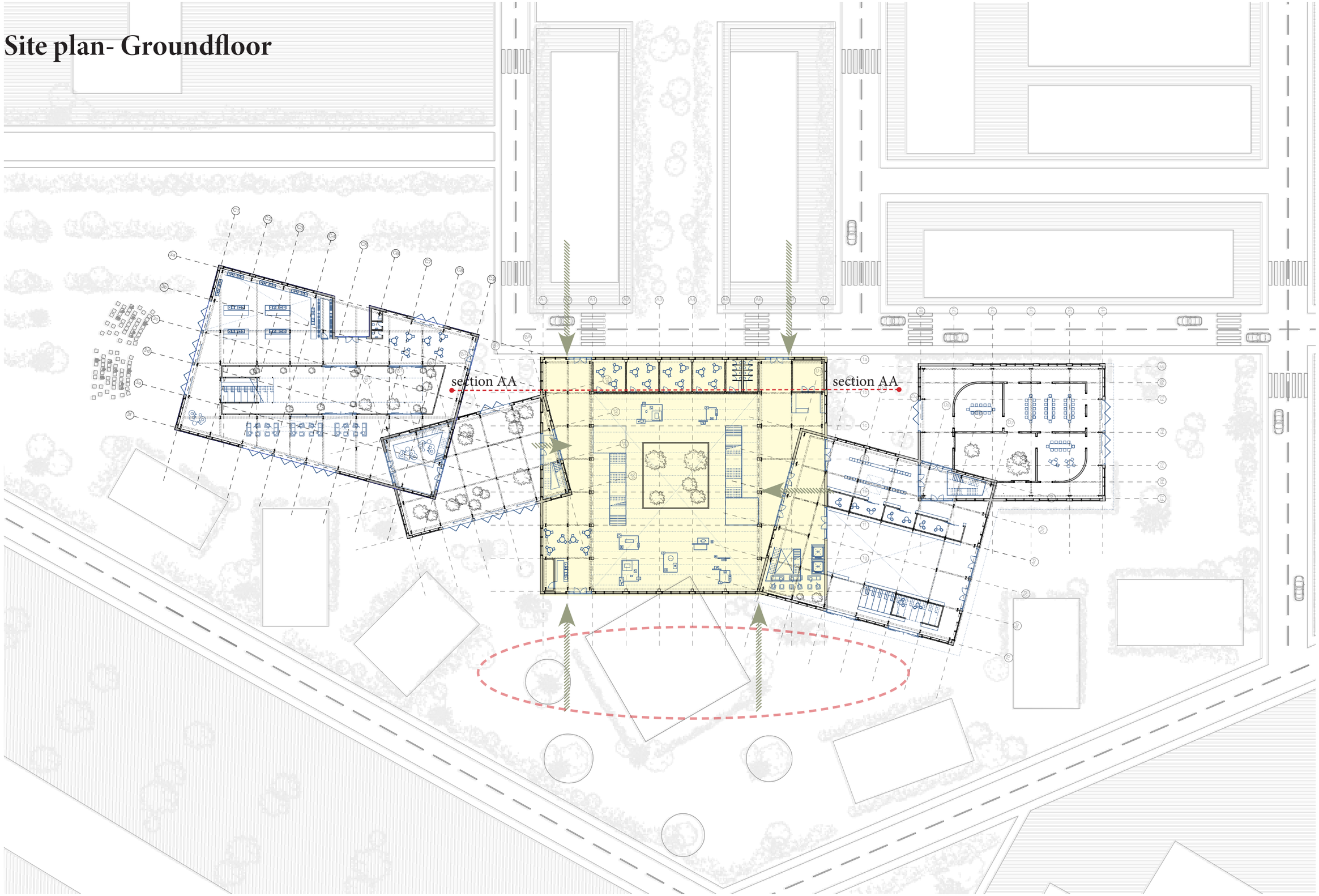
Architecture as Social Instruments

Fabriken
Typology

Site plan- Groundfloor



User and Programmes

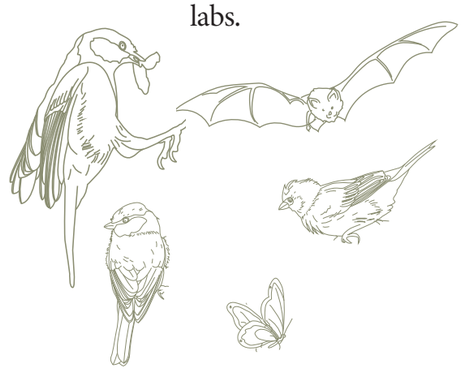
Framework Setters

"those who govern and guide"- Policy makers, organizers, and institutional stewards who shape the possibilities of the site.

Municipality
NGOs & Startups
Copenhagen Administration

Nature Inclusive

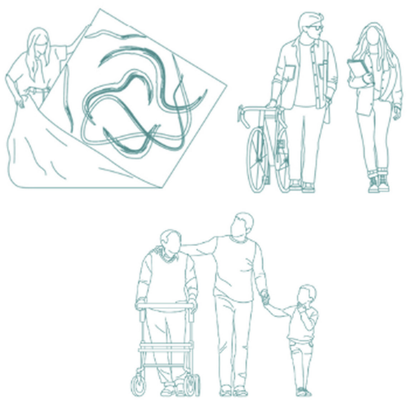
Insects, birds, bats, pollinators Urban farms, guano systems, biodiversity labs.



The Cultural Weavers

"Those Who Hold, Heal, and Translate"- The mediators and caretakers who foster relationships, rituals, and resilience across boundaries.

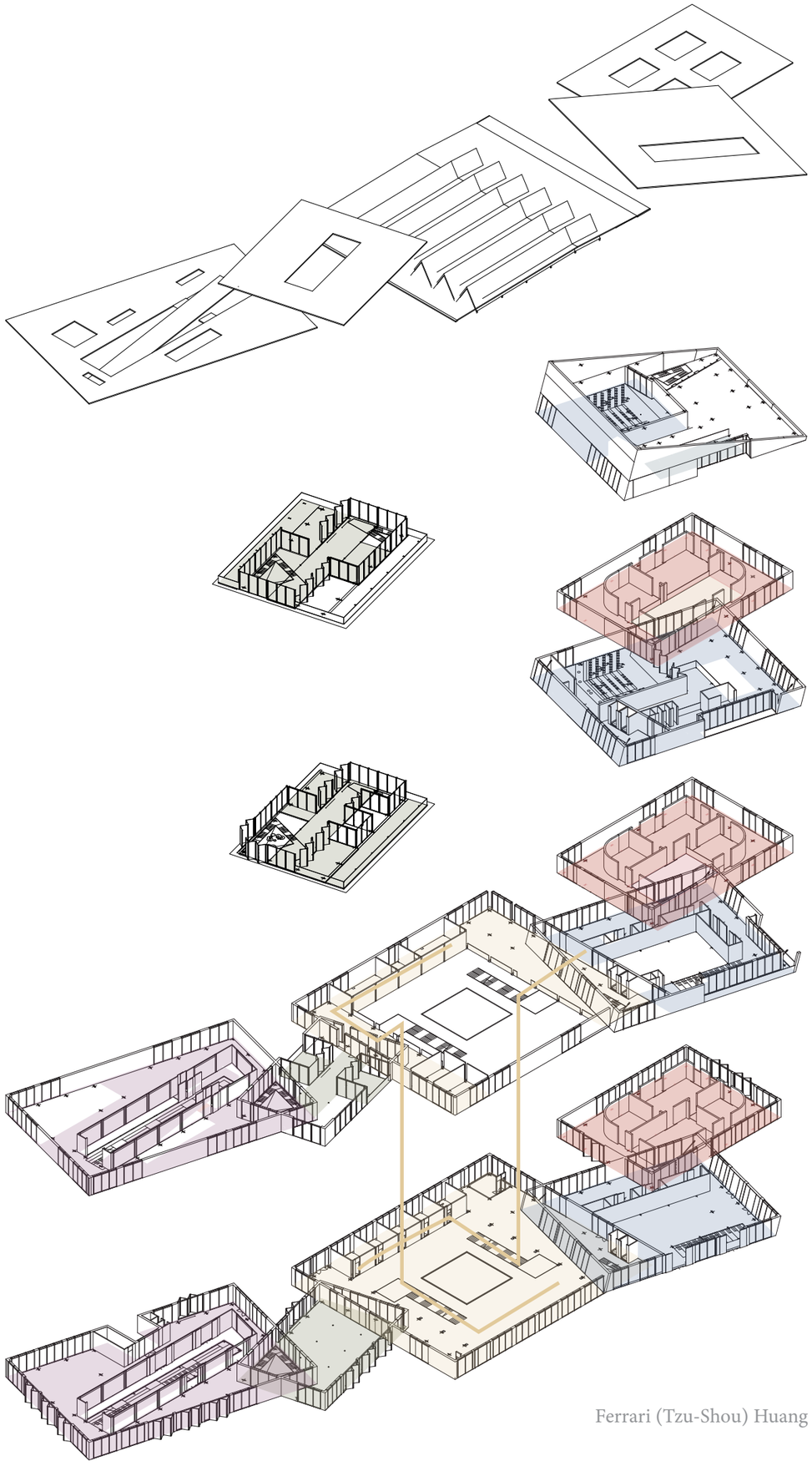
Artists, performers
Maintenance workers
Therapists, educators, social workers



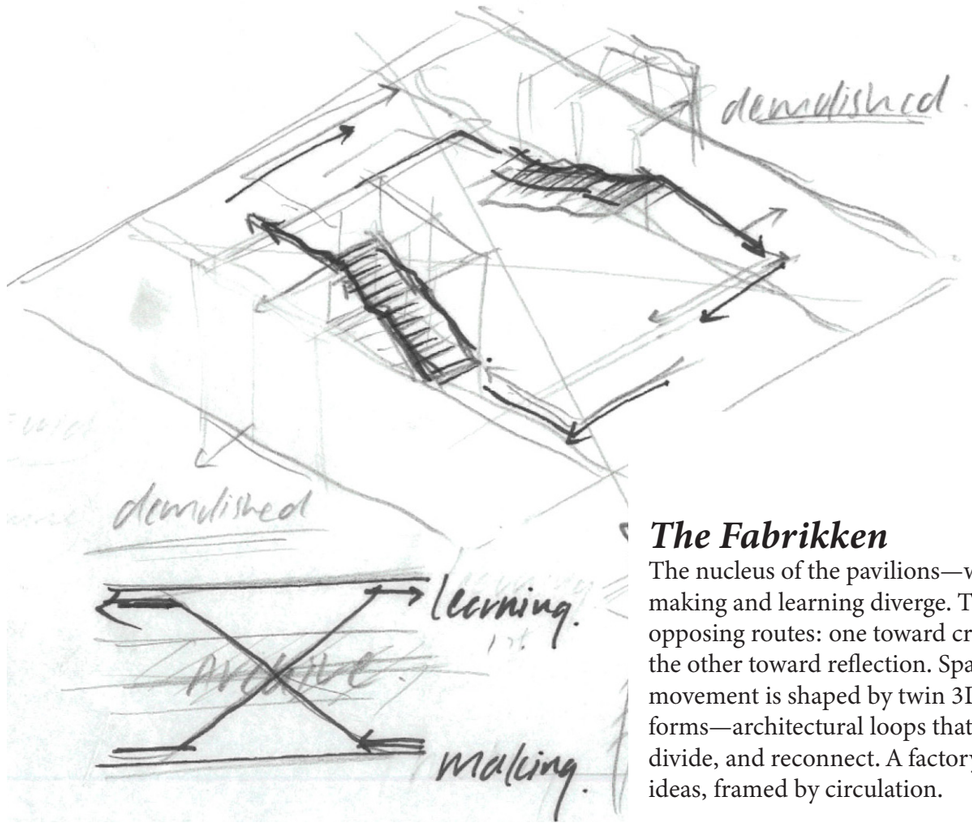
The Fabriken

Ground floor:
1. art studios
2.offices
3. central couortyard
4. artist exhibition
5. cafe

First floor:
1. recreational spaces
2. learning zones
3. historical archive

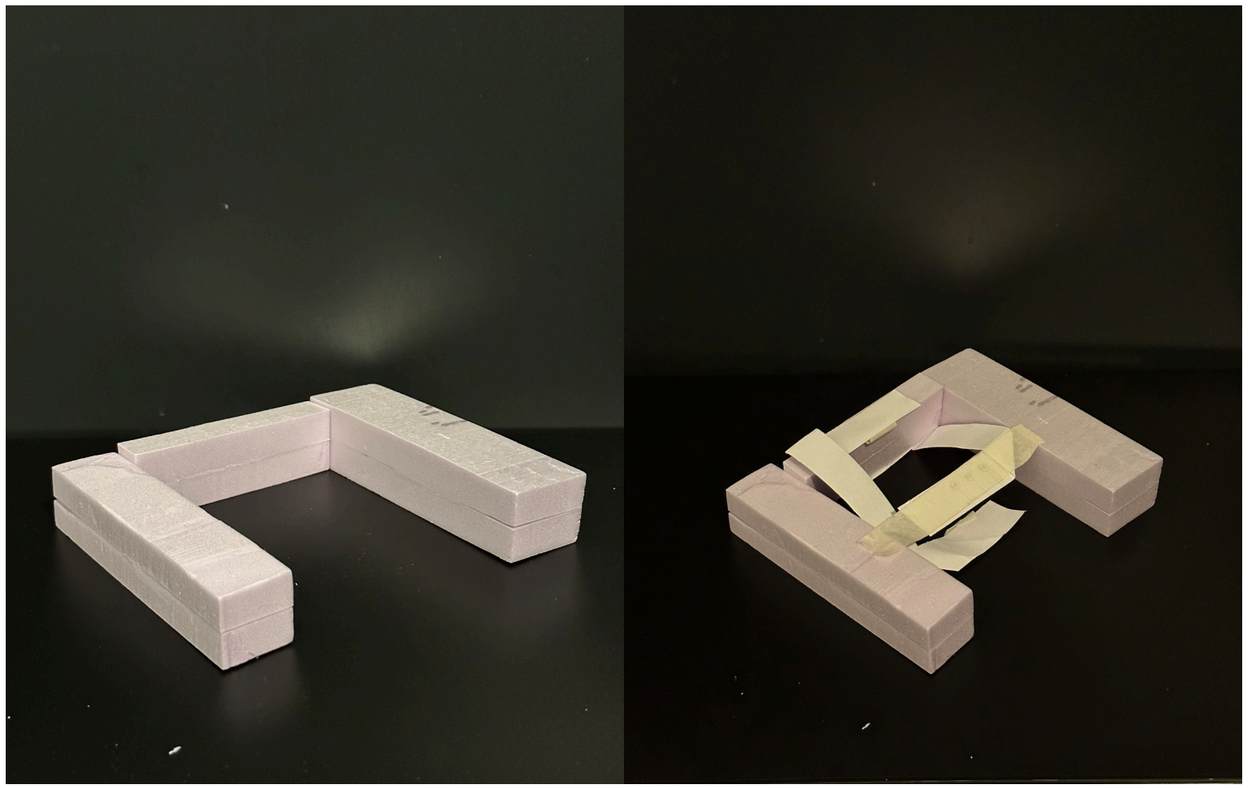


Design Process

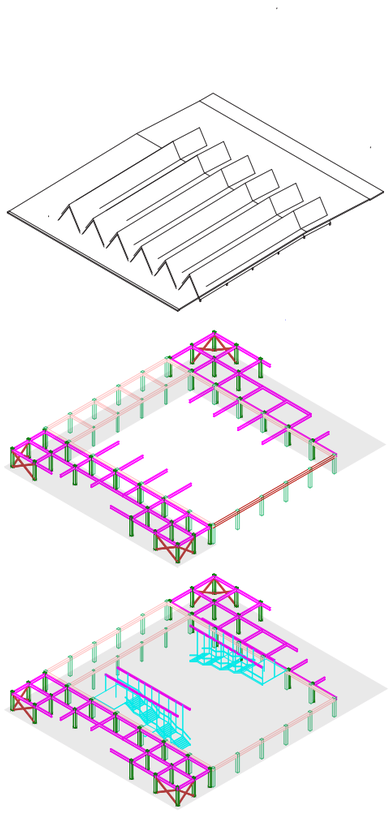


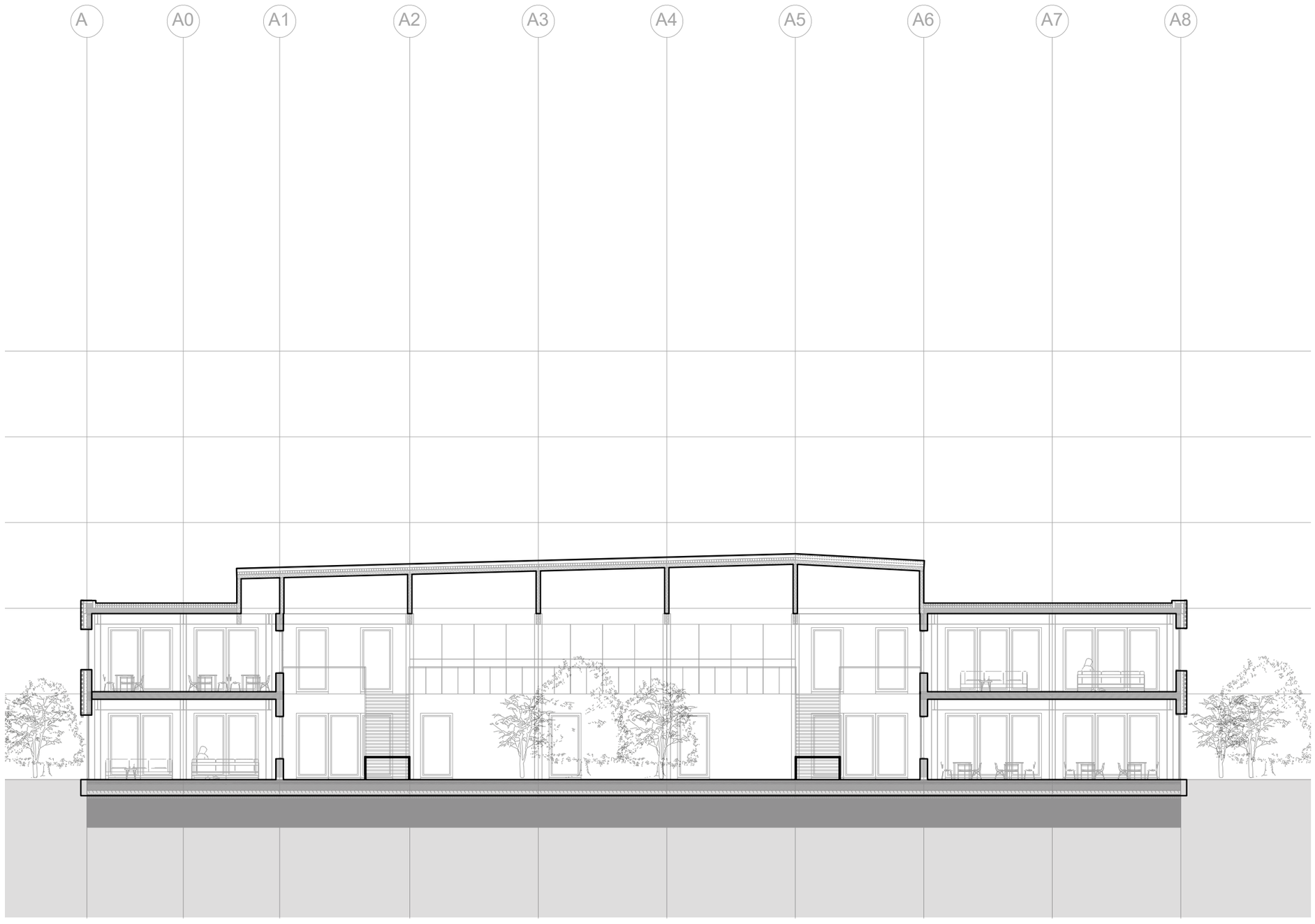
The Fabrikken

The nucleus of the pavilions—where making and learning diverge. Two opposing routes: one toward creation, the other toward reflection. Spatial movement is shaped by twin 3D “U” forms—architectural loops that guide, divide, and reconnect. A factory of ideas, framed by circulation.



Section

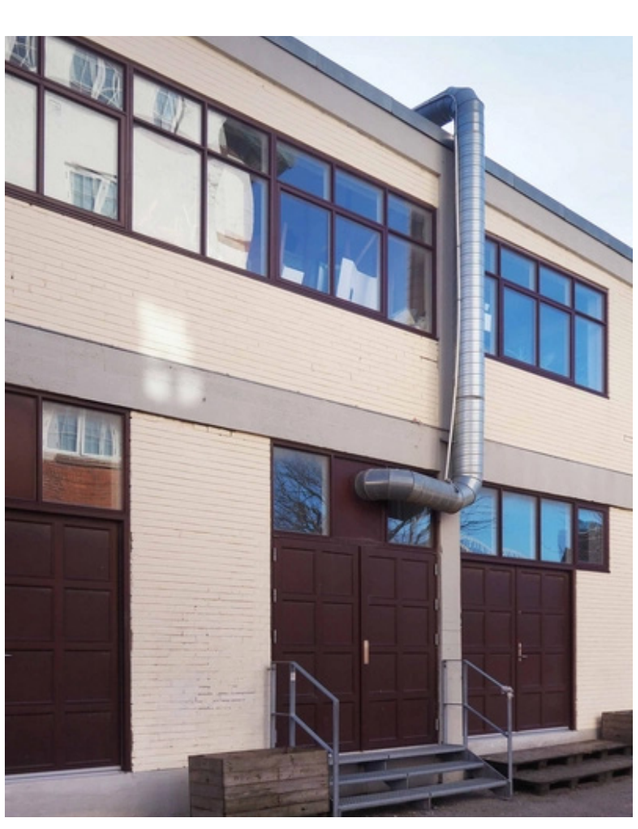




Section View Description:

The design retains the existing Fabriken concrete load-bearing structure and roof, while replacing the original wall with insulated precast brick veneers and new windows. A steel-framed side addition features cross and horizontal bracing for structural stability. At the center, a tree-lined courtyard introduces light, ventilation, and a natural focal point within the space.

Our Stories begins with a *Seed*
Library-City, a place to nurture, play and learn



Ferrari (Tzu-Shou) Huang

Our Stories begins with a *Seed*
Library-City, a place to nurture, play and learn

Ferrari (Tzu-Shou) Huang

Our Stories begins with a *Seed*
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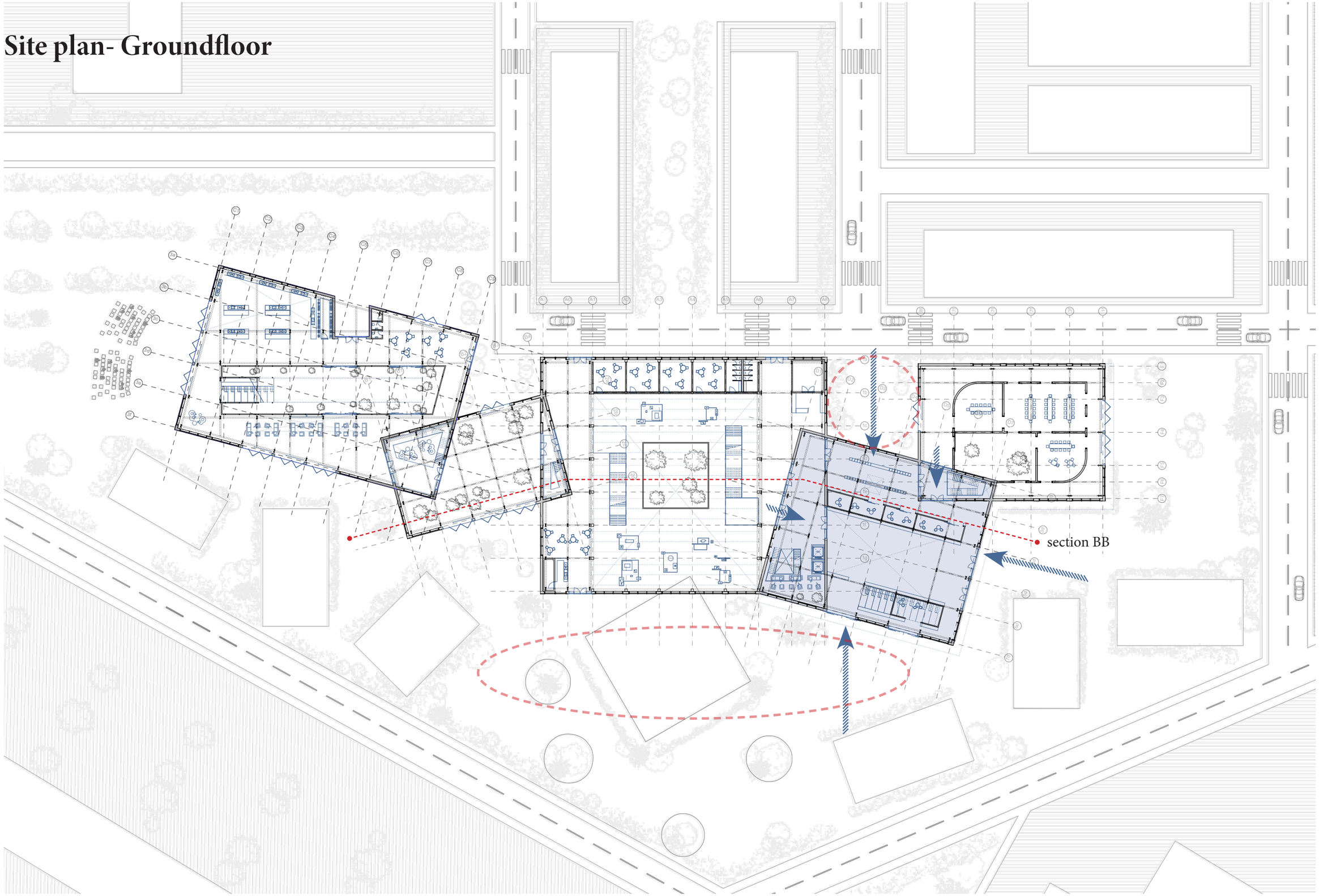
Architecture as Social Instruments

Library & Theatre

Ferrari (Tzu-Shou) Huang

Site plan- Groundfloor



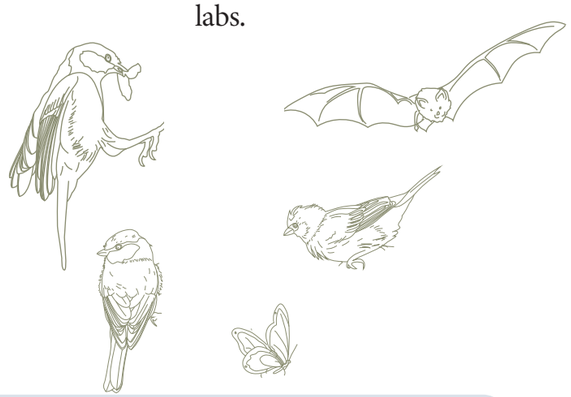
User and Programmes

The Everyday Public

Citizens of Copenhagen
Local researchers, ecologists
Migrants, visitors, students

Nature Inclusive

Insects, birds, bats, pollinators Urban farms, guano systems, biodiversity labs.



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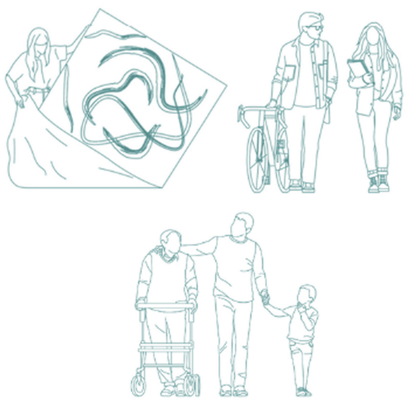
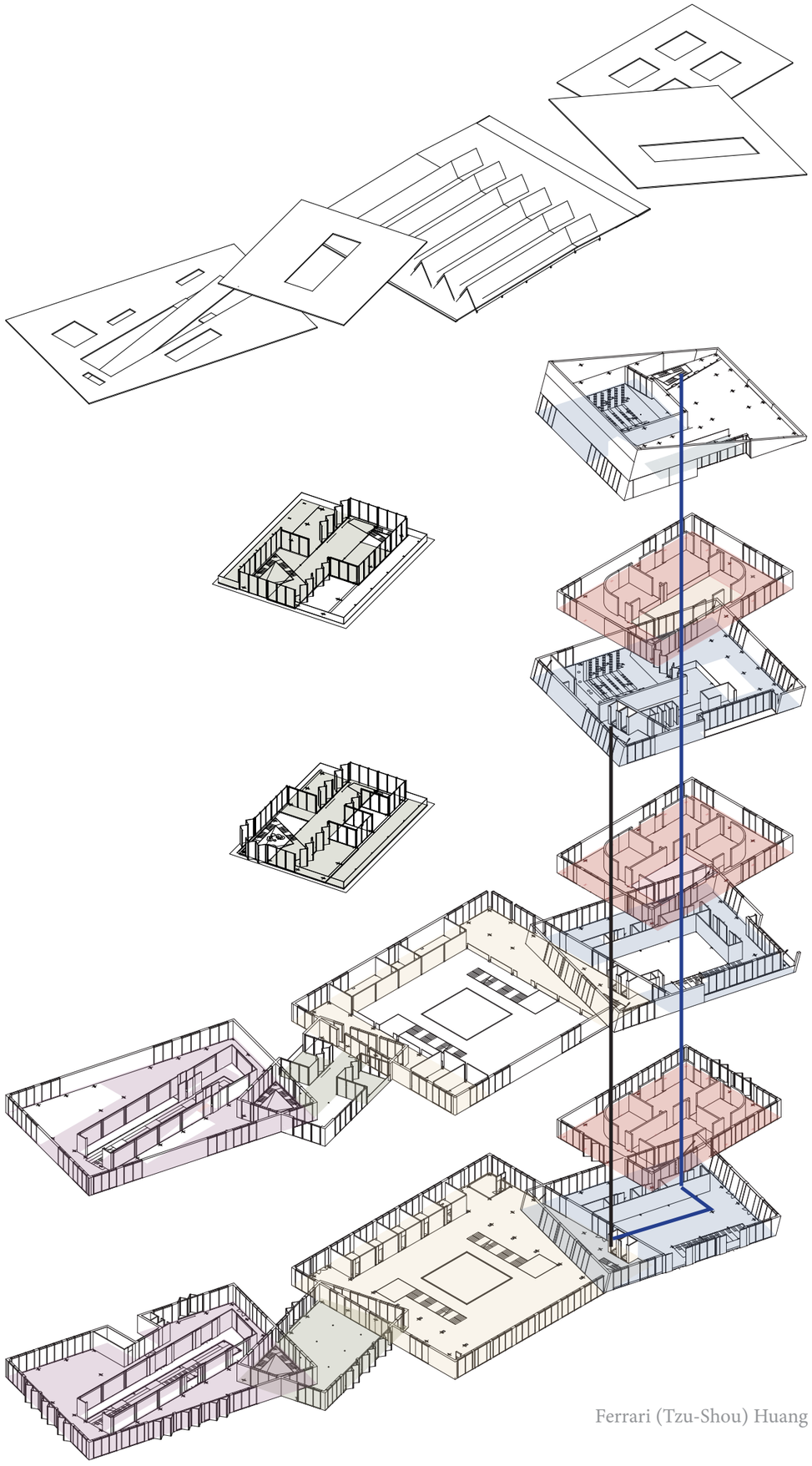


Library and Theatre

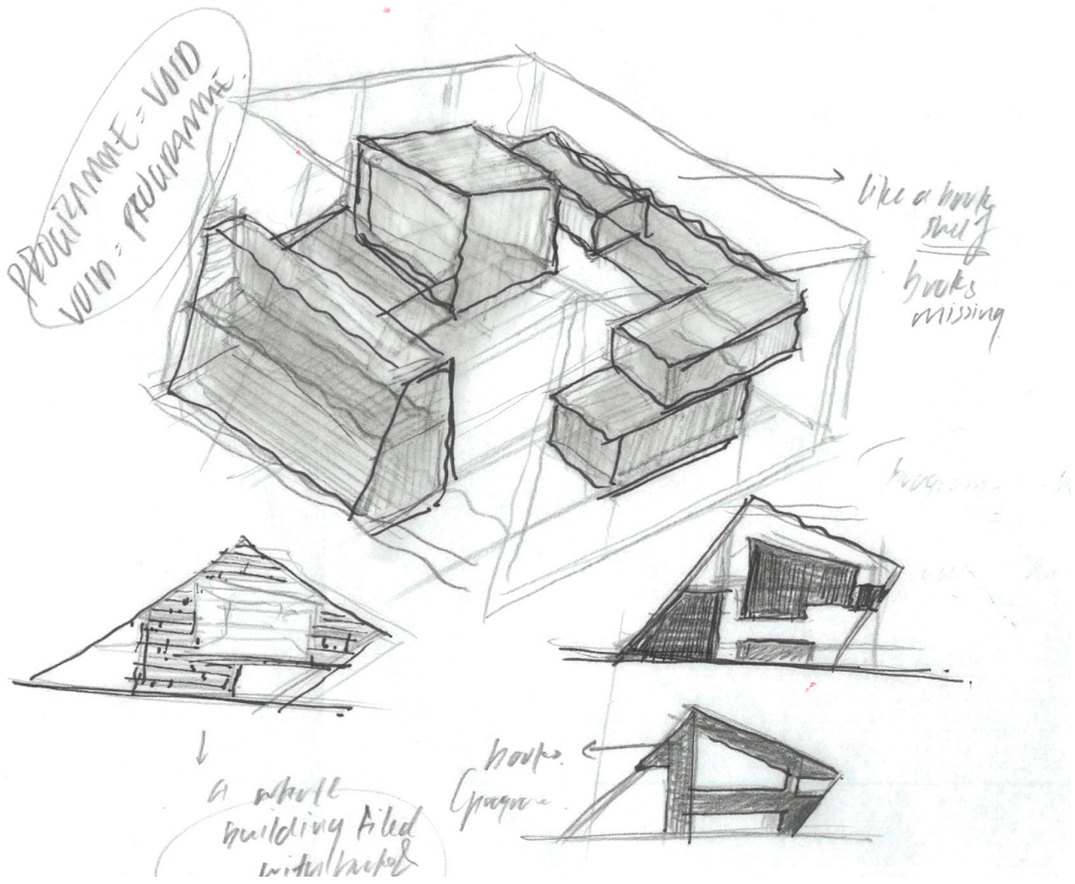
Ground and first floor:
1. Library
2. Staircase auditorium
3. Toilet
4. Co-working rooms

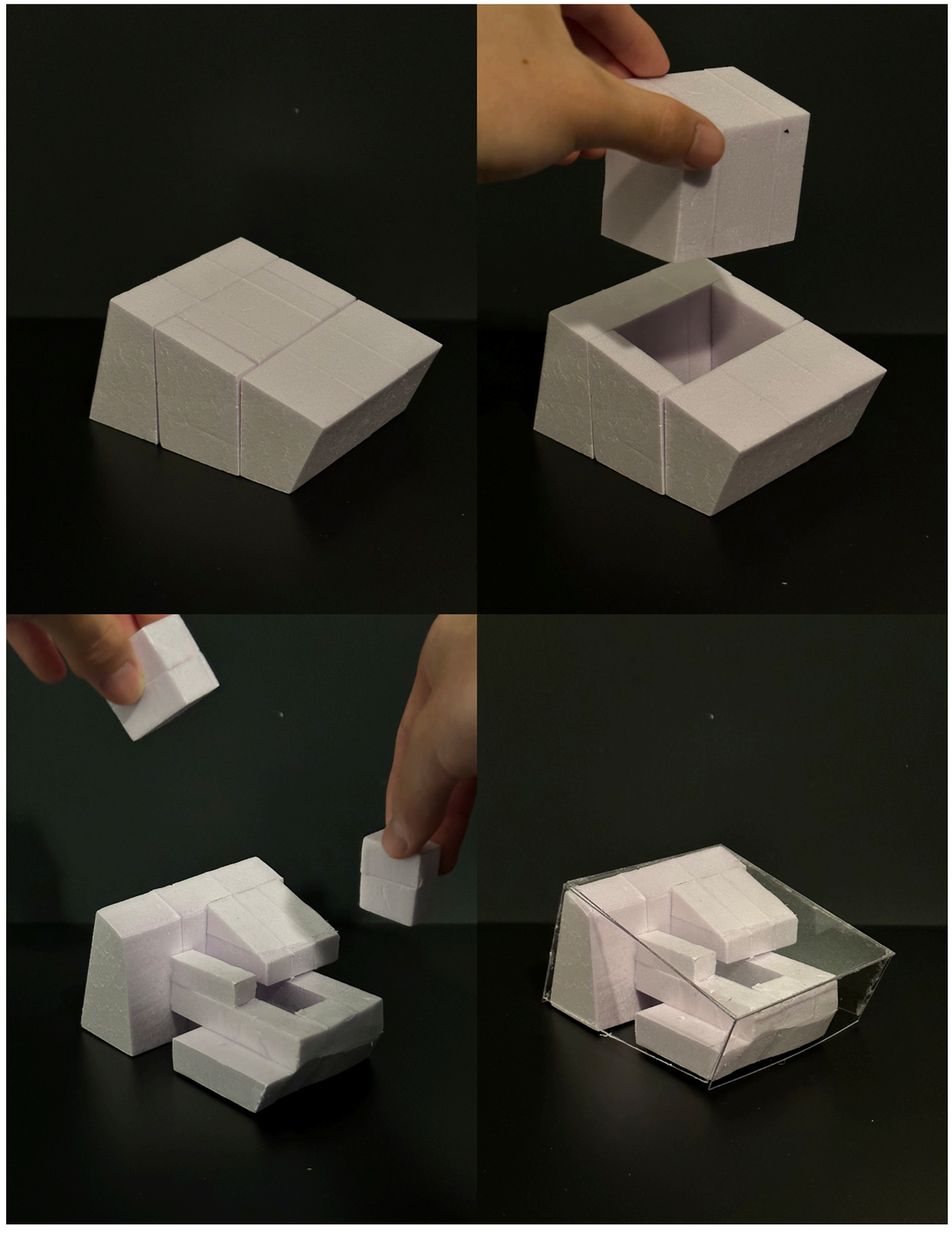
Second and third floor:
1. Theatre
2. Library
3. Co-working rooms
4. Bar
5. Media rooms
6. Balcony for biodiversity watching



Ferrari (Tzu-Shou) Huang

Design Process



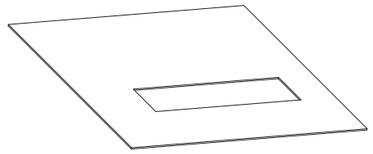


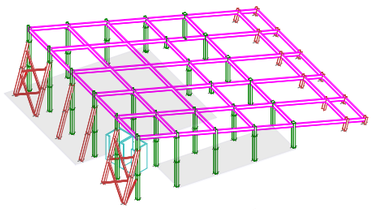
Void as Program, Program as Void

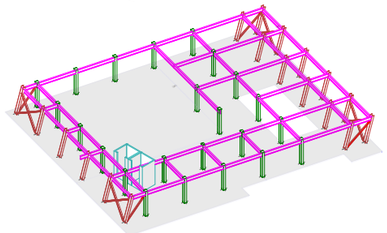
A hybrid typology—library, co-working, theatre—where circulation becomes part of the program. Hallways are no longer gaps, but active spaces, integral to the expe-rience. The program inhabits the voids, rethinking structure and function as one continuous flow.

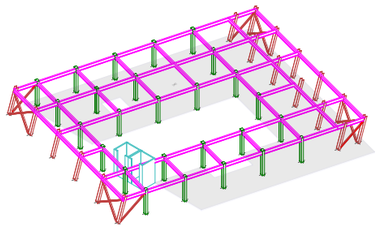
Ferrari (Tzu-Shou) Huang

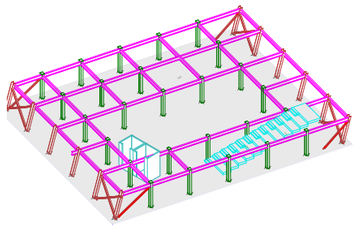
Section





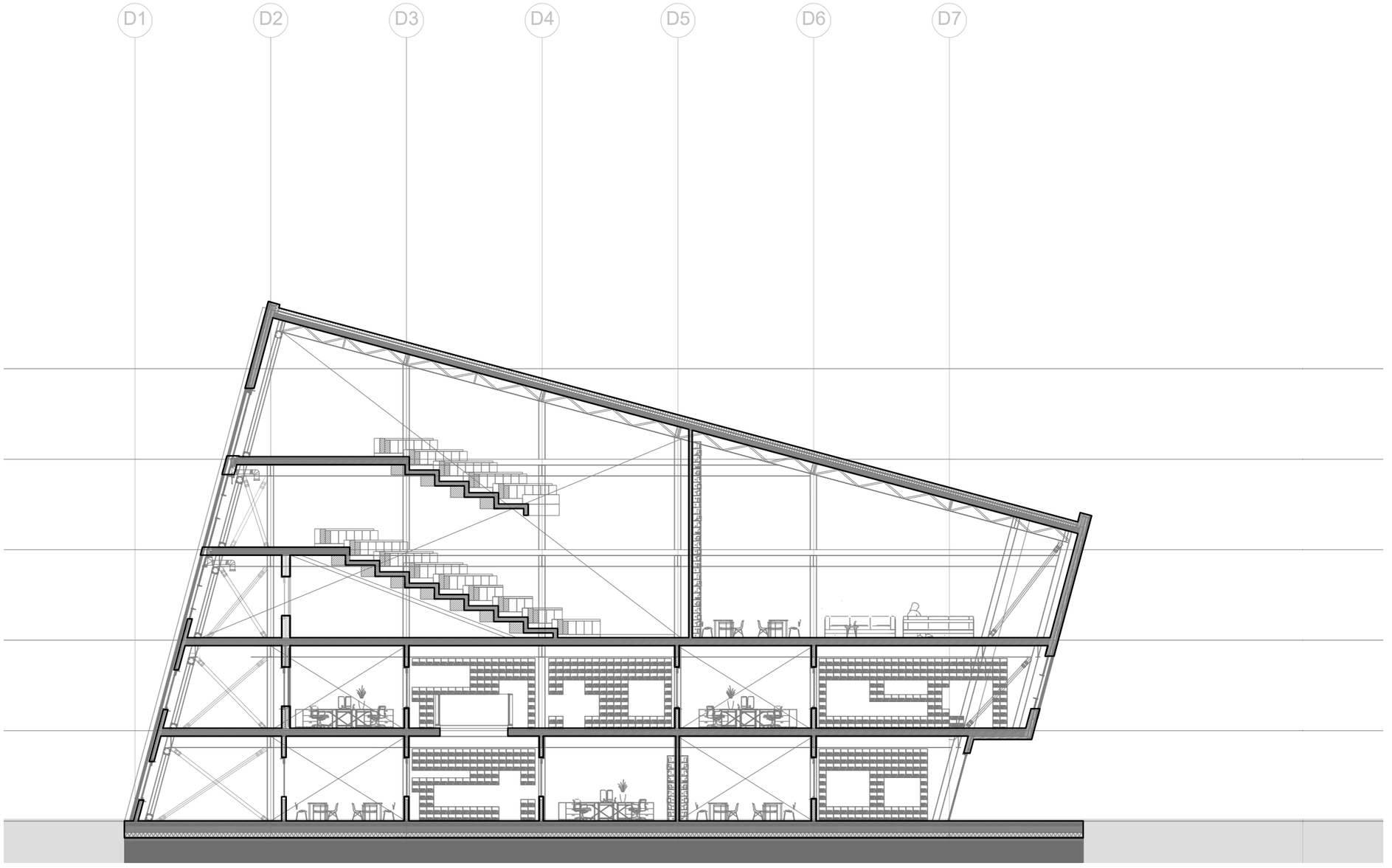






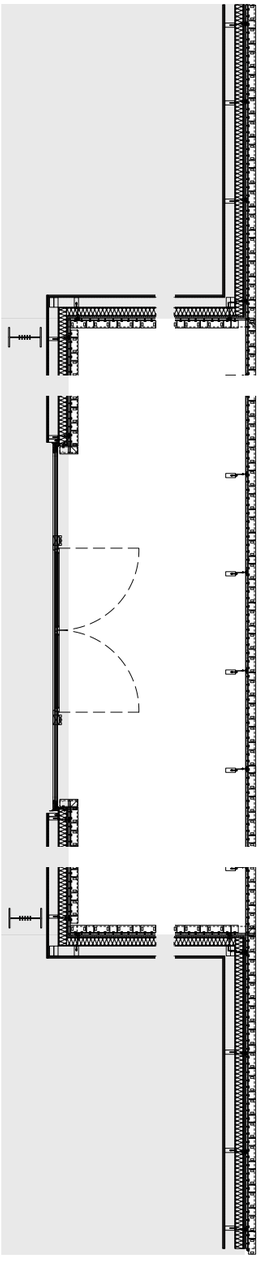
Section View Description:

The library and theatre occupy a steel-framed structure tilted at 15 degrees, with cross bracing on the sides for structural support. Brick veneers, also angled at 15 degrees, echo the building's form. . Carefully placed window frames capture curated exterior views, enhancing the spatial experience from within.



Ferrari (Tzu-Shou) Huang

Our Stories begins with a *Seed*
Library-City, a place to nurture, play and learn



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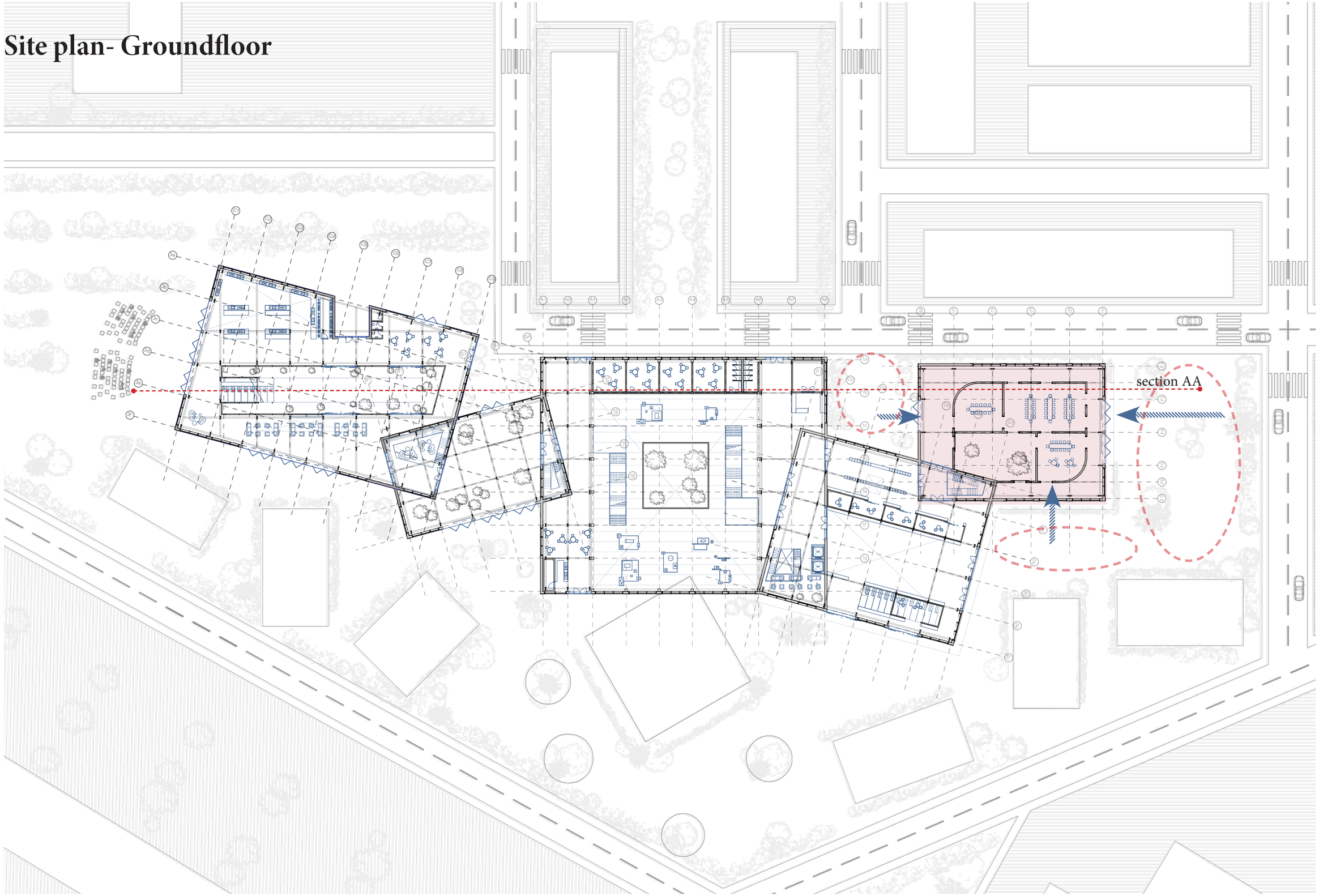
Architecture as Social Instruments

Workshop
Museum

Ferrari (Tzu-Shou) Huang

Site plan- Groundfloor



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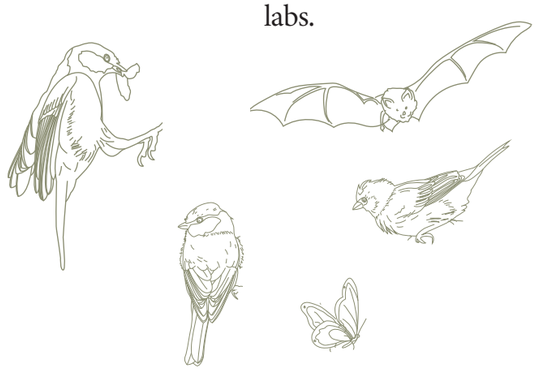

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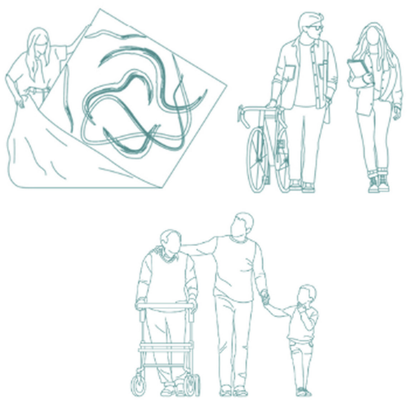


Workshops

Ground floor:

2. Urban Biodiversty and making lab
"Build your own bee hotels, butterfly boxes, birdhouses using reclaimed wood."
3. Central courtyard
4. Seed exchange corner and habitat map of local neighbourhood biodiversity.

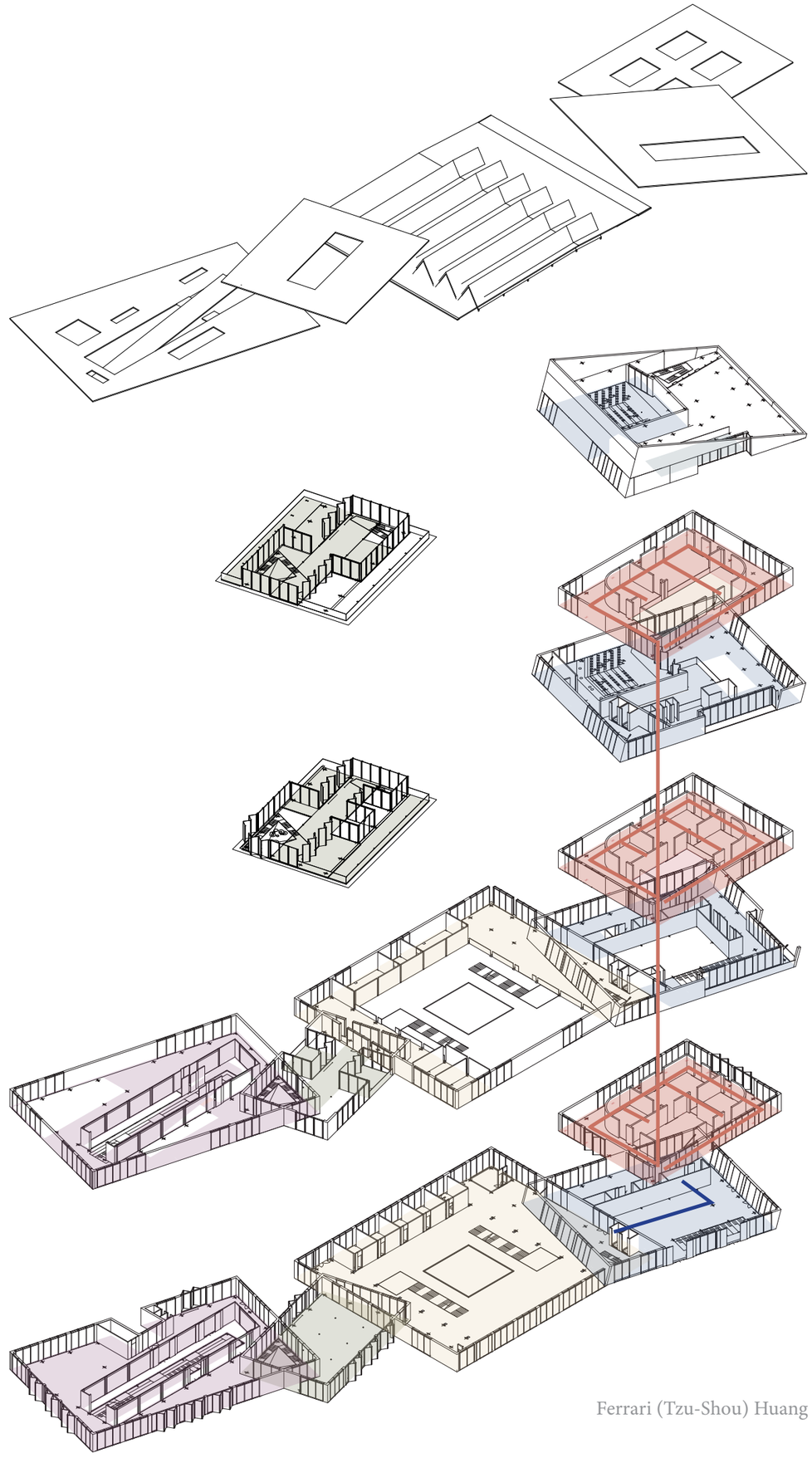
First floor:

2. Microbial and Material Lab
"Explore the hidden worlds of fungi, bacteria and bio-based materials - mycelium molding workshops

Second floor:

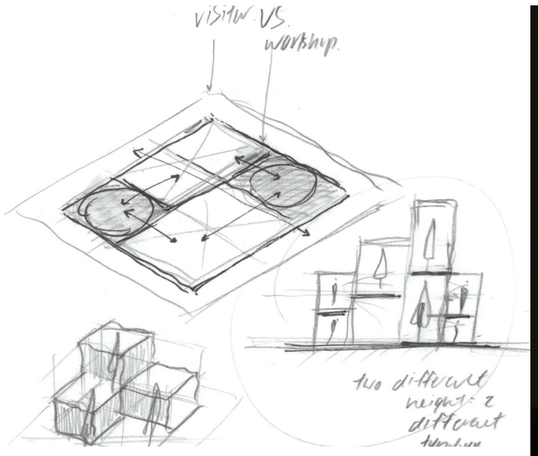
2. The Bio- Art Studio
"A contemplation, sensory floor where biodiversity meets storytelling, performance and plant dyes"

Ground = macro (visible nature, habitats)
1st = micro (unseen life, systems)
2nd = cultural (human-nature relationships)



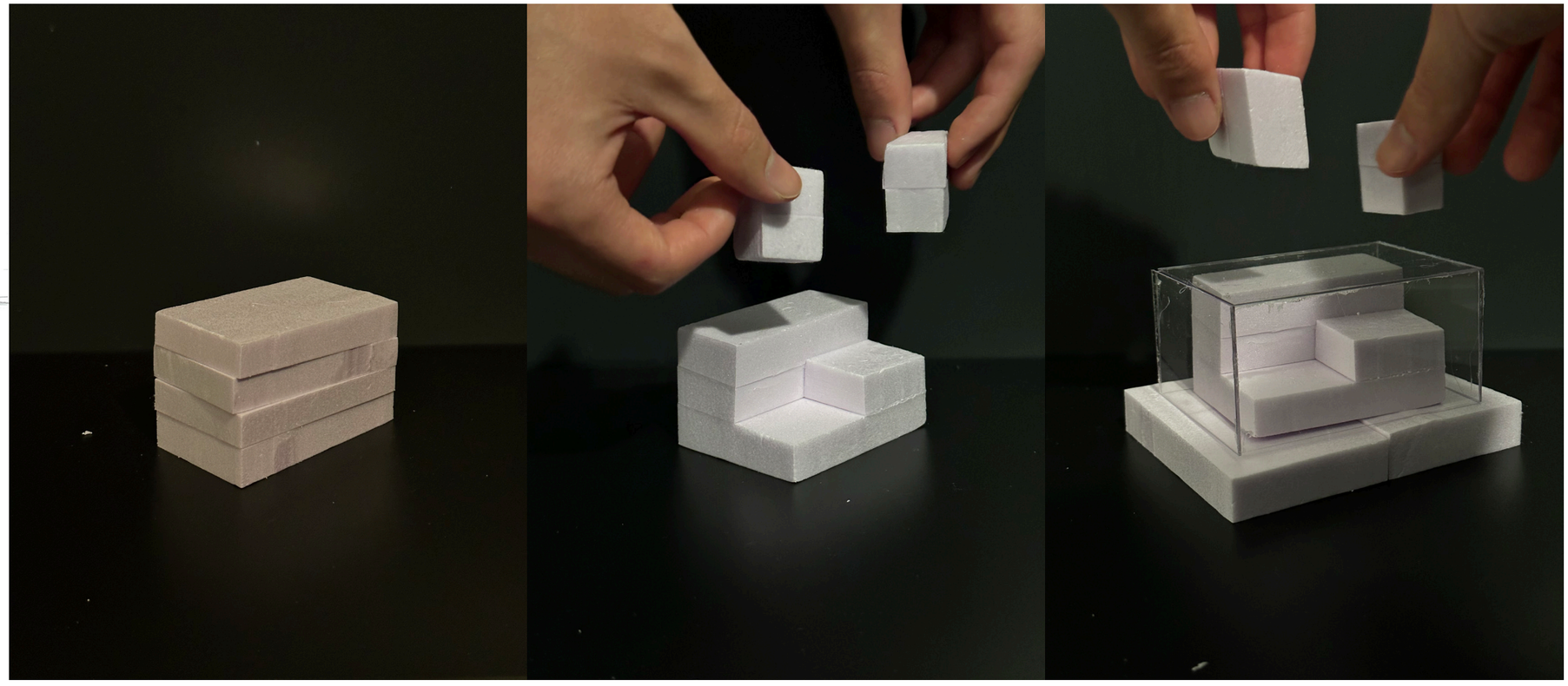
Ferrari (Tzu-Shou) Huang

Design Process

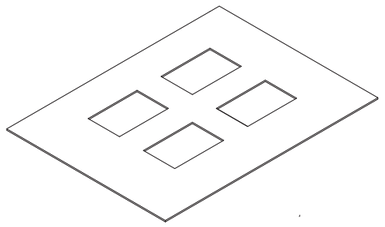


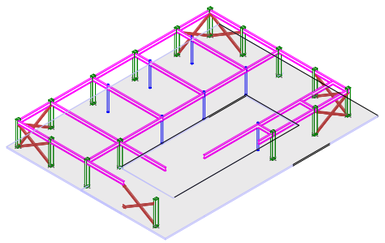
A Museum or a Workshop?

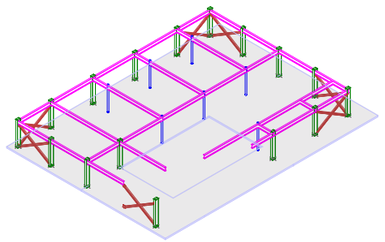
An inversion of roles—an outer ring for viewing, an inner core for making. The boundaries blur, and workers become part of the museum experience, not separate from it. The act of creation is on display, making production and consumption one continuous exchange.

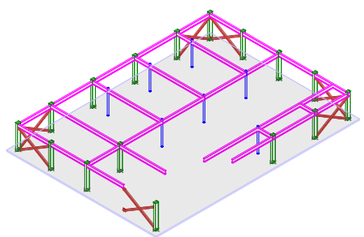


Section



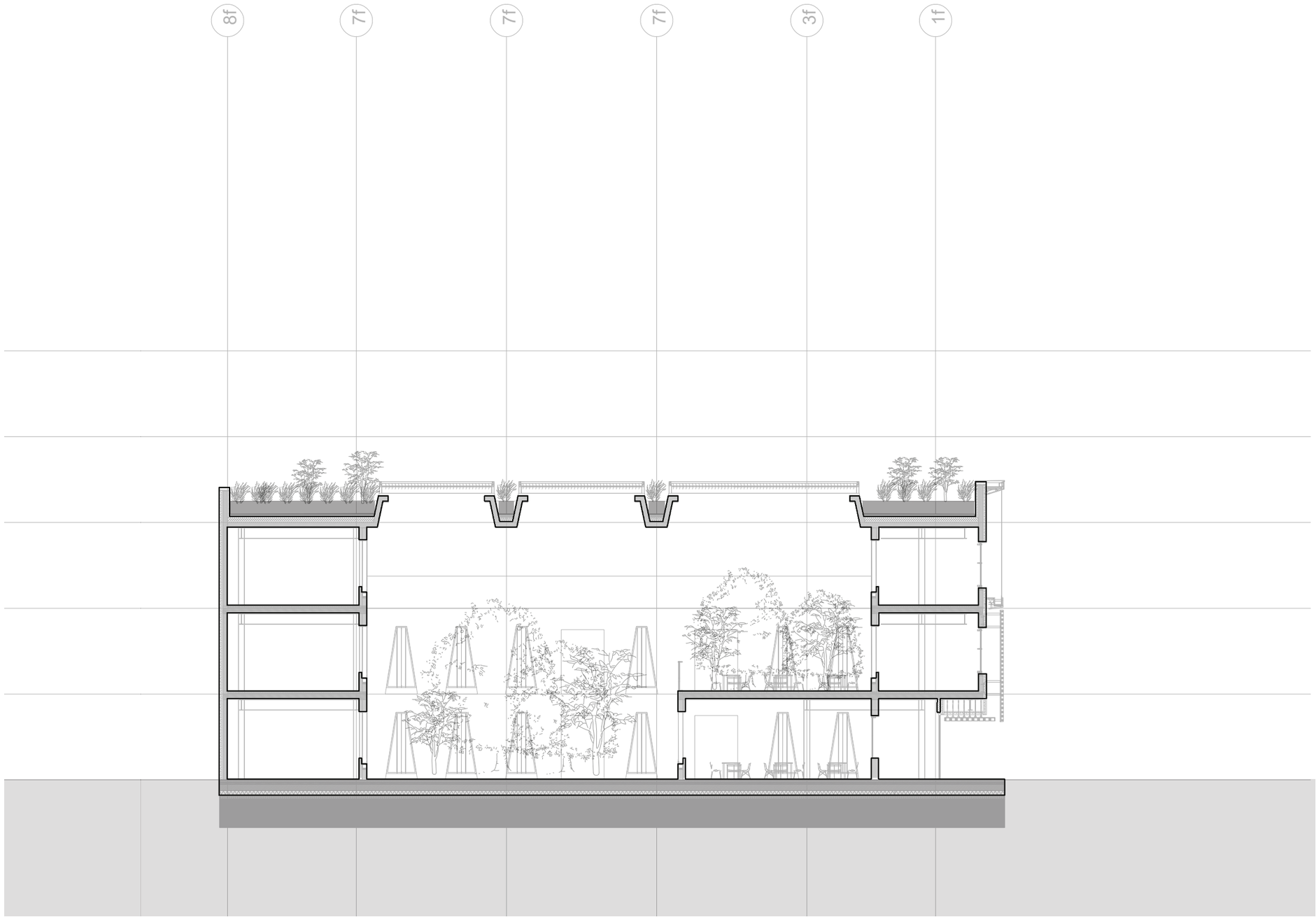






Section View Description:

The workshop is housed in a steel-framed structure designed to support biodiversity through climate-responsive and ecological strategies. The facade, inspired by Vietnamese greenery, features plants growing across and around window openings, naturally filtering incoming air. Integrated brick habitats within the facade provide shelter, while vegetation offers food for birds, fostering a living ecosystem.



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Library-City, a place to nurture, play and learn

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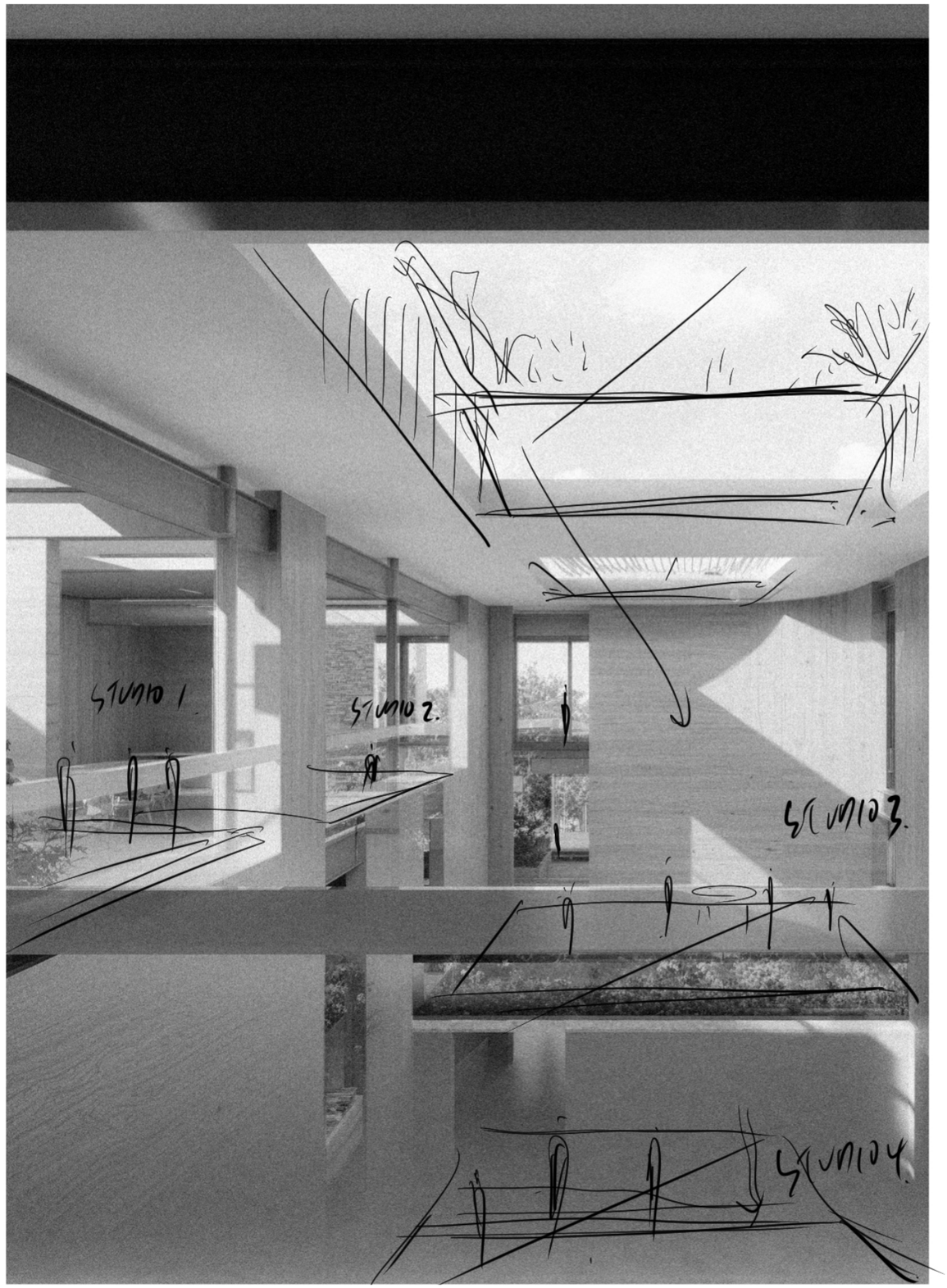

Ferrari (Tzu-Shou) Huang

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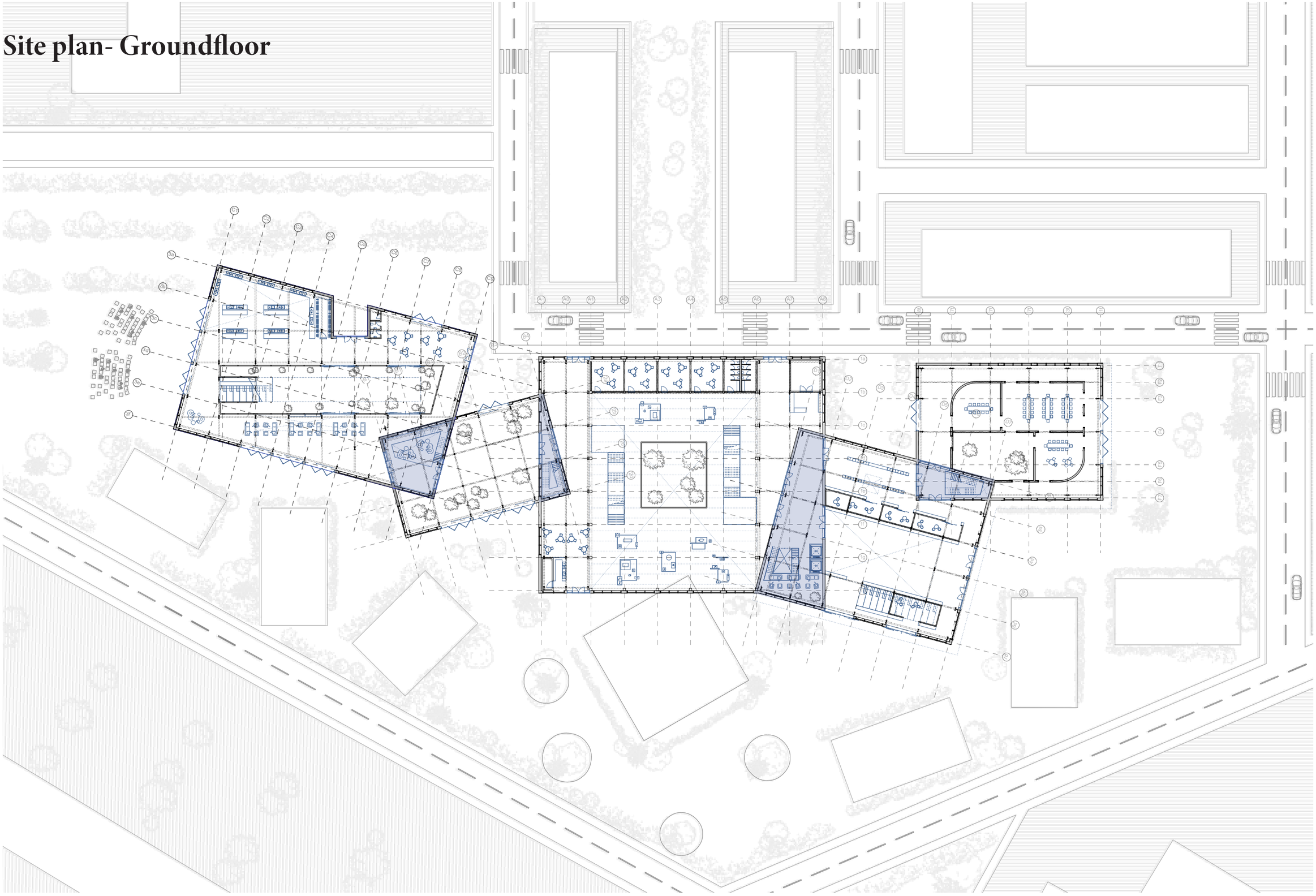
Architecture as Social Instruments

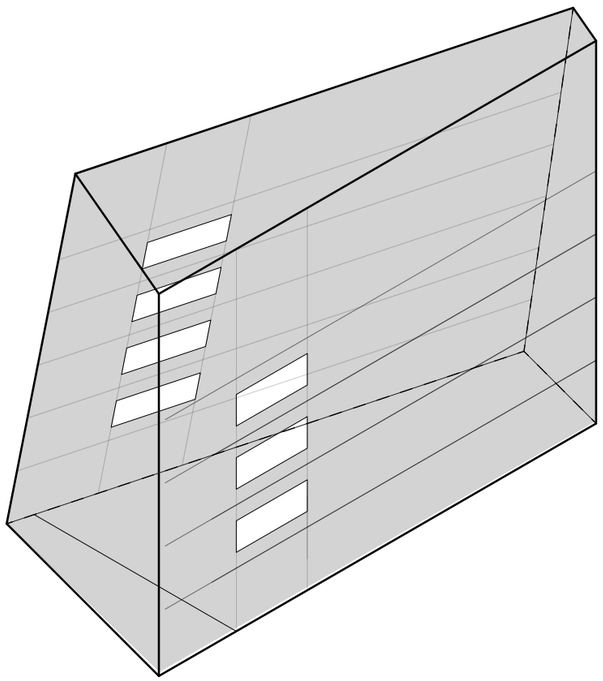
The inbetween space

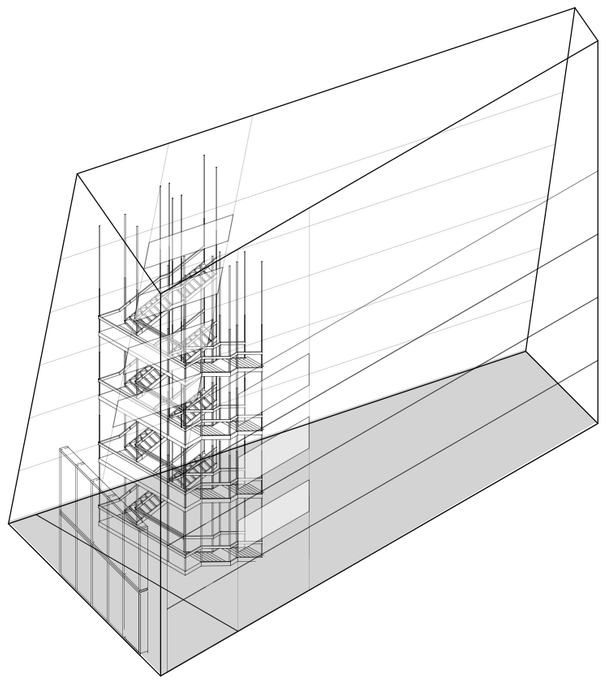
Ferrari (Tzu-Shou) Huang

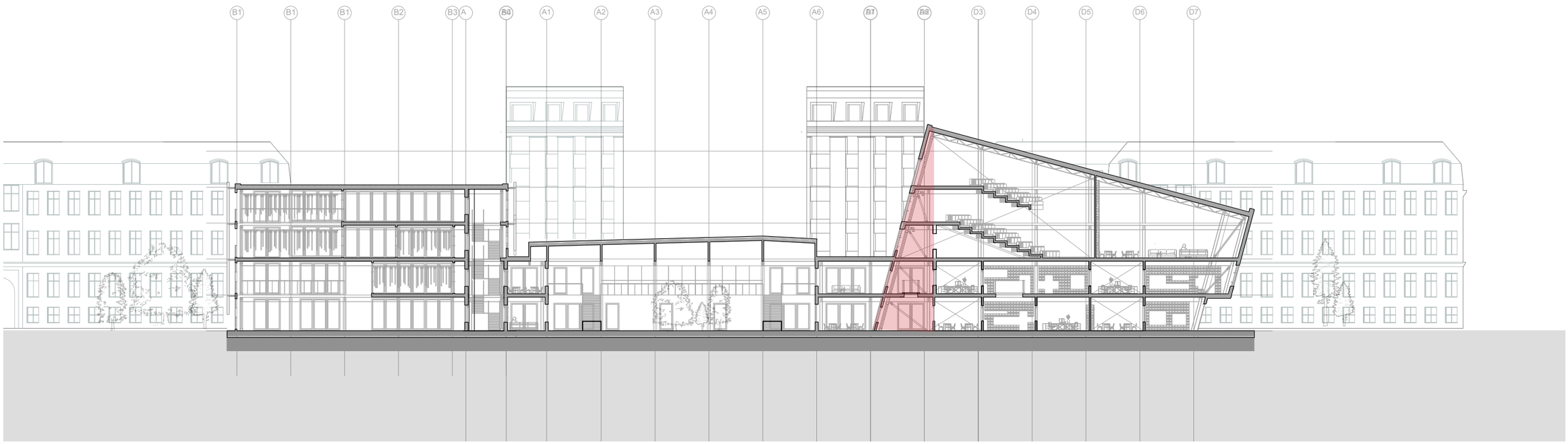
Site plan- Groundfloor



Inbetween Space







Ferrari (Tzu-Shou) Huang

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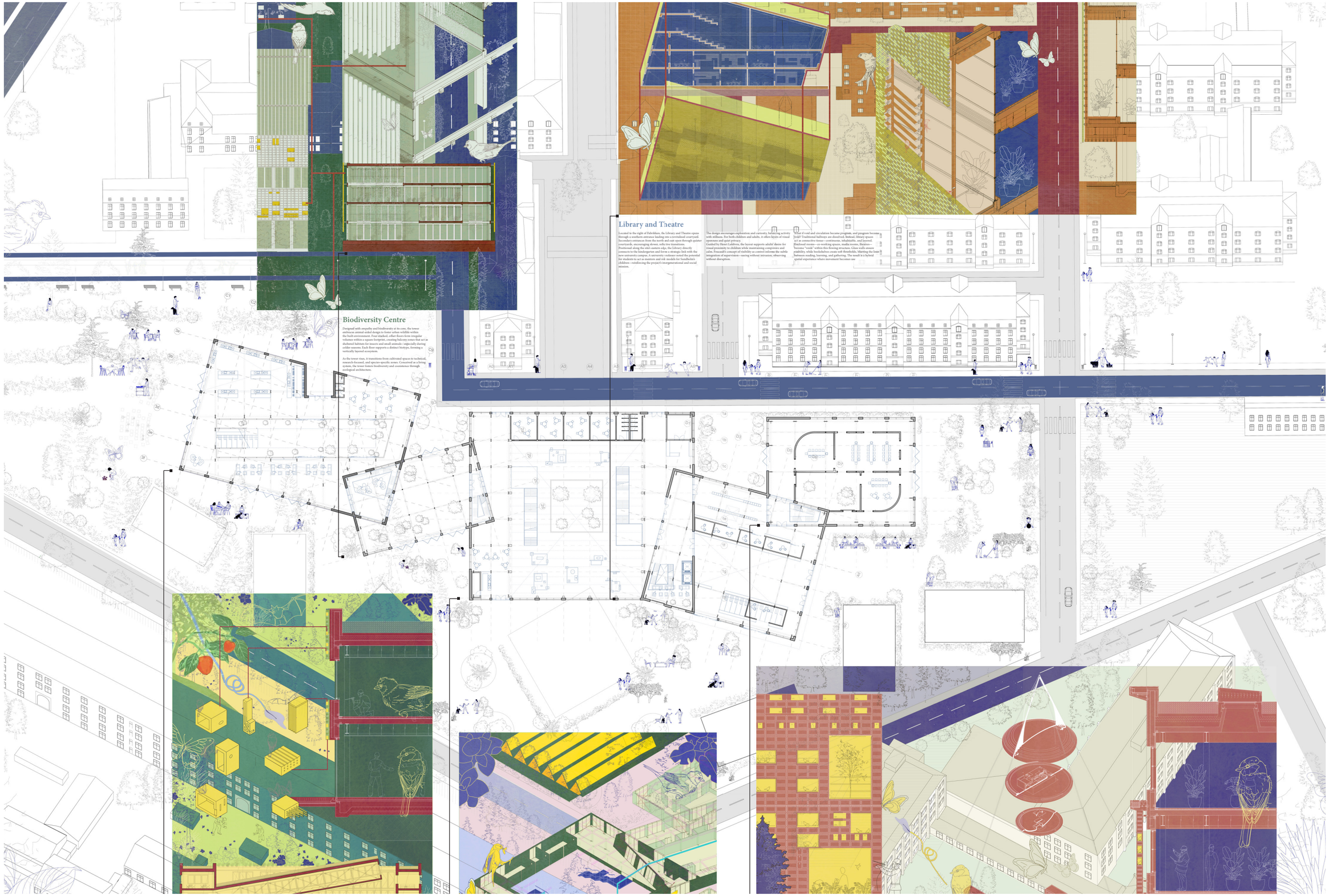
The Third Space

The inbetween boundaries

Our Stories begins with a *Seed*

Library-City, a place to nurture, play and learn



Ferrari (Tzu-Shou) Huang

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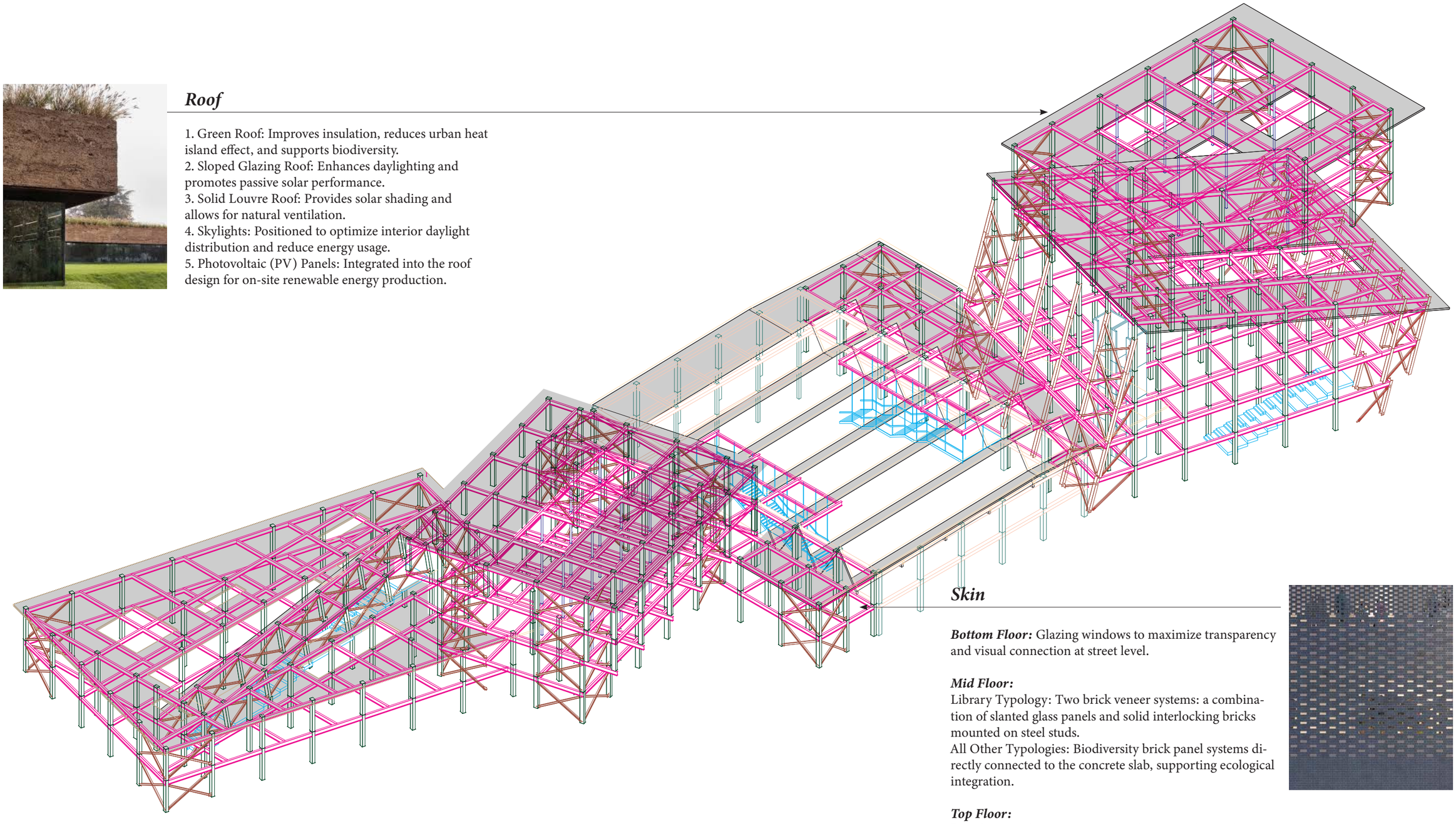
Technical Design

Ferrari (Tzu-Shou) Huang

Structural Diagram

Roof

1. Green Roof: Improves insulation, reduces urban heat island effect, and supports biodiversity.
2. Sloped Glazing Roof: Enhances daylighting and promotes passive solar performance.
3. Solid Louvre Roof: Provides solar shading and allows for natural ventilation.
4. Skylights: Positioned to optimize interior daylight distribution and reduce energy usage.
5. Photovoltaic (PV) Panels: Integrated into the roof design for on-site renewable energy production.



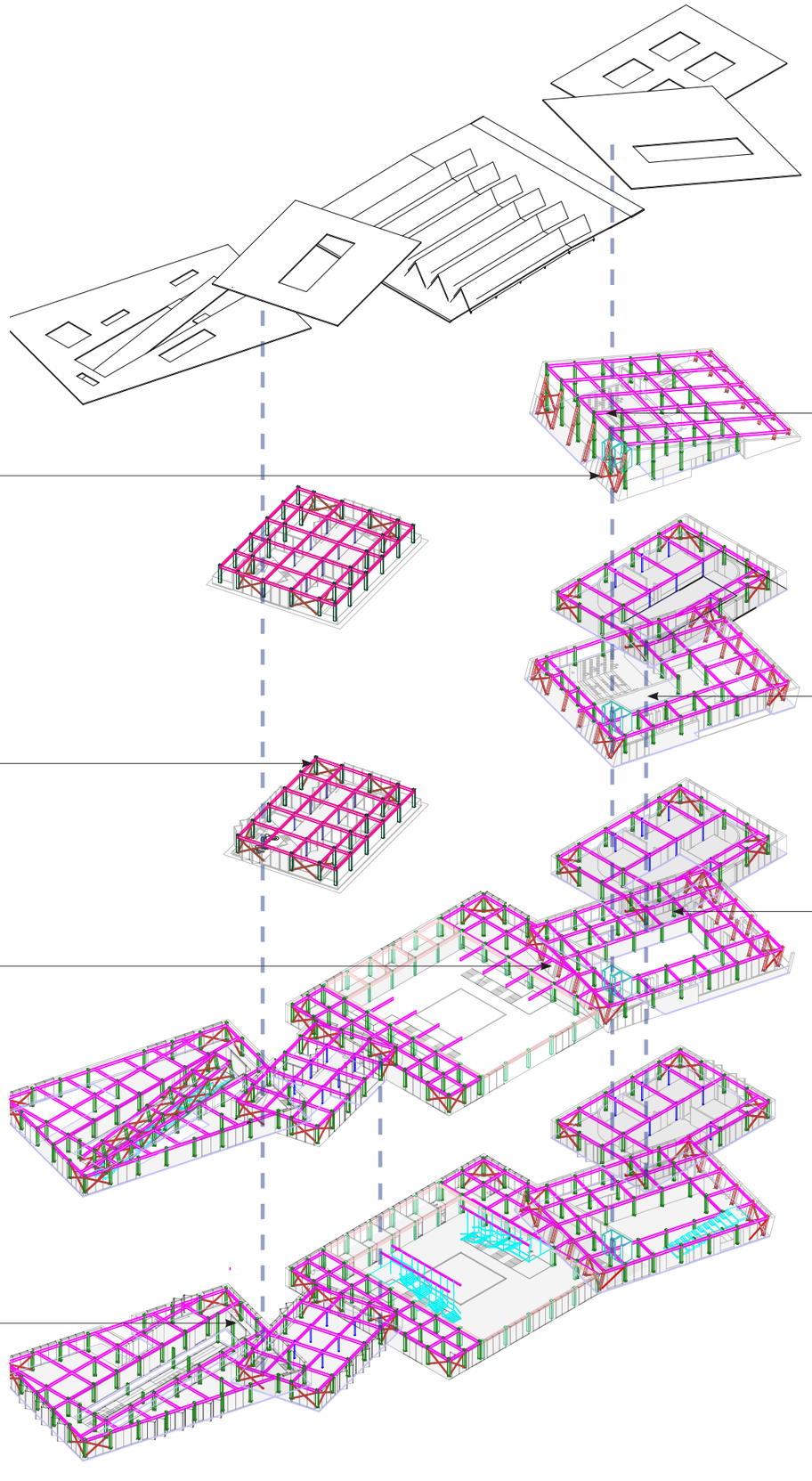
Skin

Bottom Floor: Glazing windows to maximize transparency and visual connection at street level.

Mid Floor:
Library Typology: Two brick veneer systems: a combination of slanted glass panels and solid interlocking bricks mounted on steel studs.
All Other Typologies: Biodiversity brick panel systems directly connected to the concrete slab, supporting ecological integration.

Top Floor:
Rotating aluminum façade panels for dynamic shading.
Green wall system for environmental enhancement.
Tilted interlocking brick façade for texture and visual depth.

Construction Process



Vertical & Slanted Columns

Structural columns (both vertical and angled) designed to support the overall building framework and respond to programmatic needs.

Secondary Structure

Composed of reinforced concrete slabs, steel studs, and suspended modular units for mechanical and service flexibility.

Slab

Reinforced concrete slabs serve as the primary structural floor system. Each slab is connected to a district heating system, ensuring that concrete at every level is warmly heated, contributing to thermal comfort and energy efficiency.

Service Core

Service-core plumbing integrates rainwater harvesting, greywater reuse, and hot-water pre-heating via plate heat exchangers.

Cross Bracing & Lateral Stability

Steel Cross Bracing:Integrated in selected bays to resist lateral loads and seismic forces.

Horizontal Wind Bracing: Provided at roof and floor levels to distribute wind loads across the structural system and maintain stability.

Fire Escape Stairs/ Vertical Core Layout

Strategically located for efficient and code-compliant emergency egress.

HVAC

HVAC: District-heated radiant slabs and concealed chilled-beam units circulate hot and chilled water from a central plant.

Facades

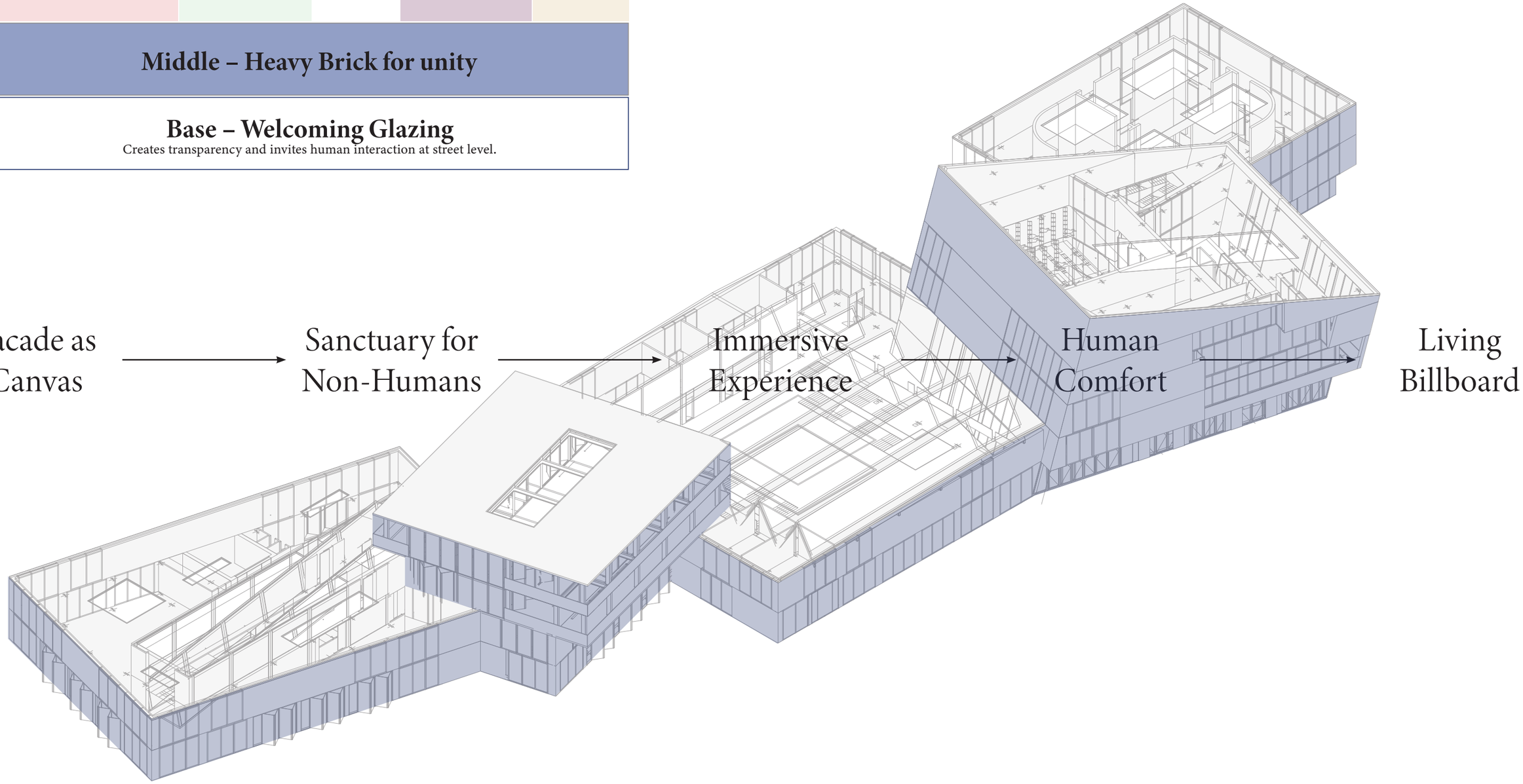
Every detail features playful biodiversity—inviting people to engage while nurturing ecosystems to thrive.

Facade

Top – Typology-Specific Elements
Individualized, biodiversity-rich panels that both engage people and nurture wildlife.

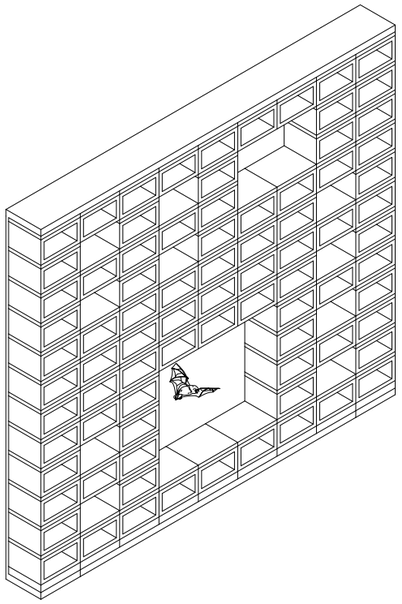
Middle – Heavy Brick for unity

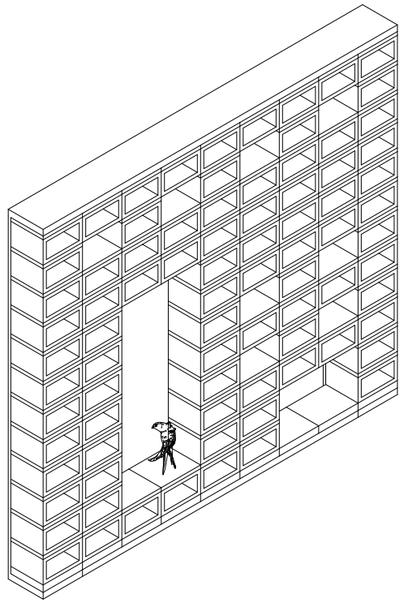
Base – Welcoming Glazing
Creates transparency and invites human interaction at street level.



Brick System 1: Modular Biodiversity bricks pannel

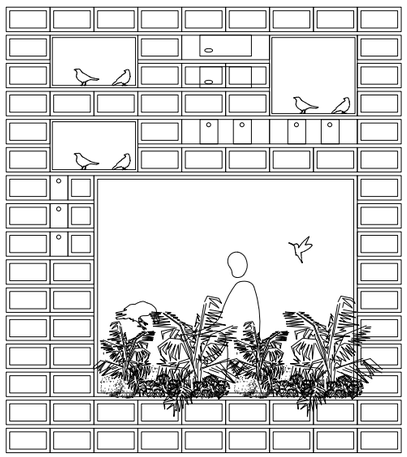
Brick Panels

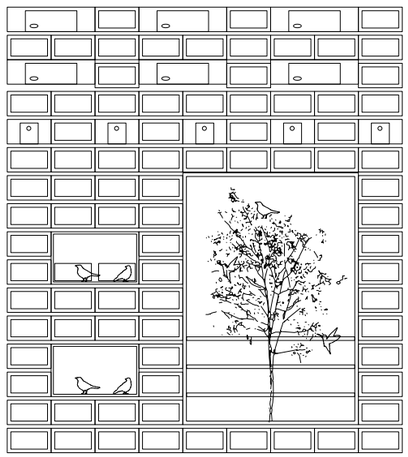


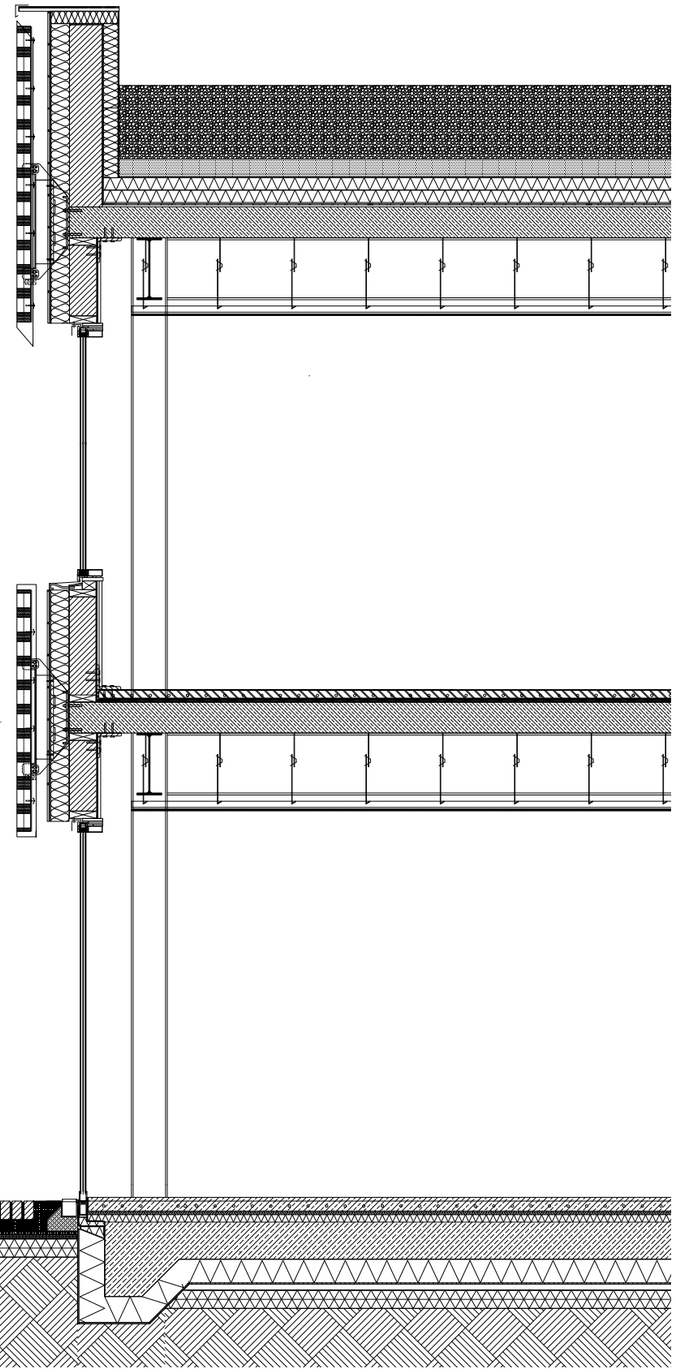


Modular Biodiversity Brick Panels

A hands-on workshop where children and educators design modular bricks that support local wildlife across the seasons—nesting pockets in spring, insect shelters in summer, seed stores in autumn, and hibernation spaces in winter.

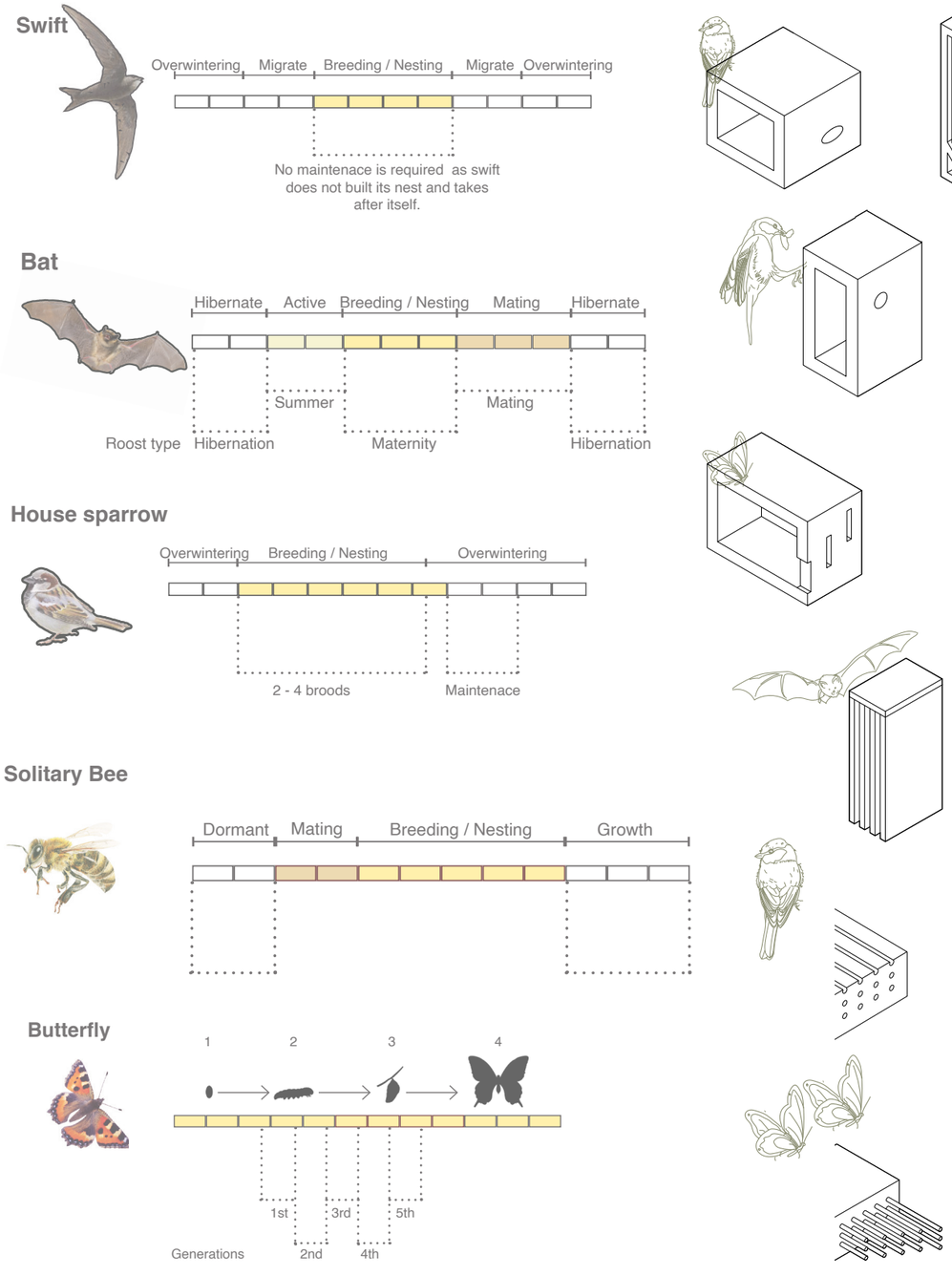




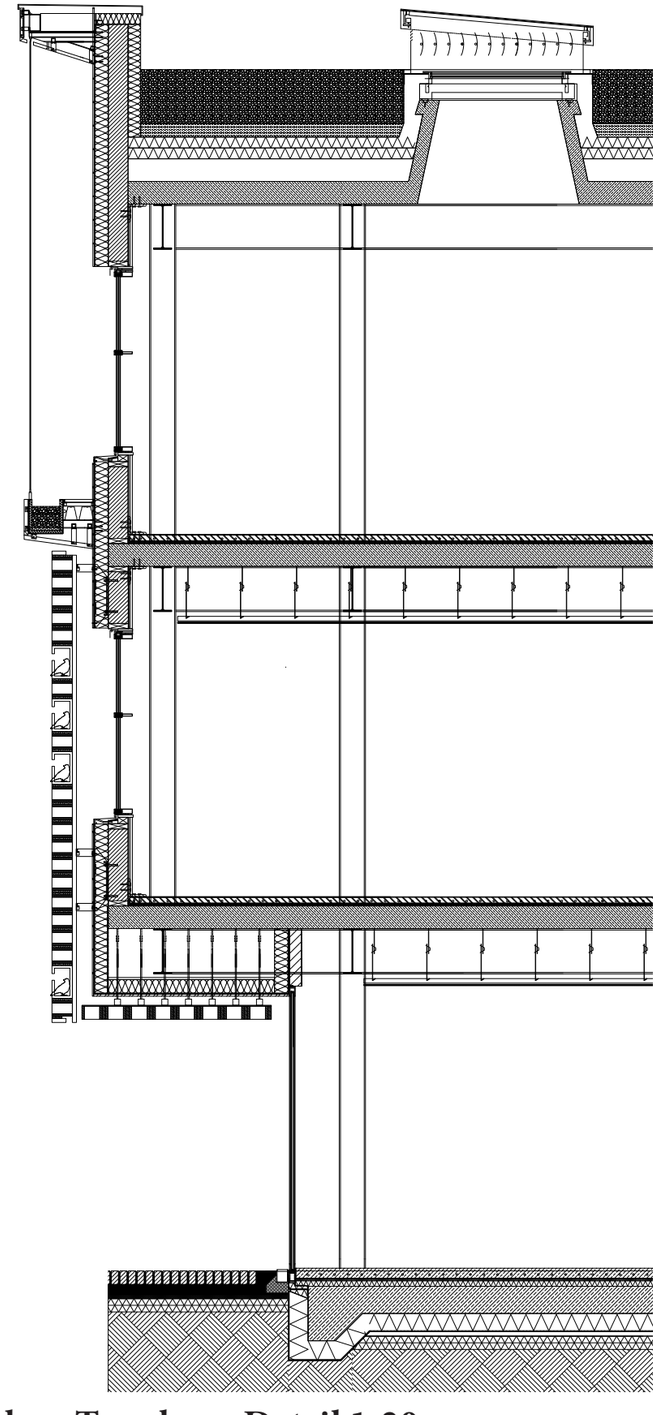


Communal Typology Detail 1:20

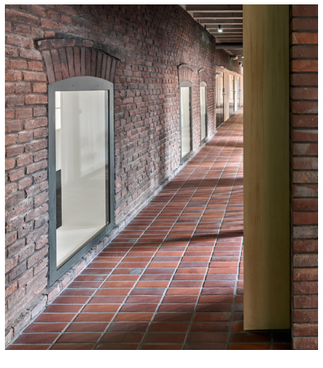
Brick System 1: Modular Biodiversity bricks pannel



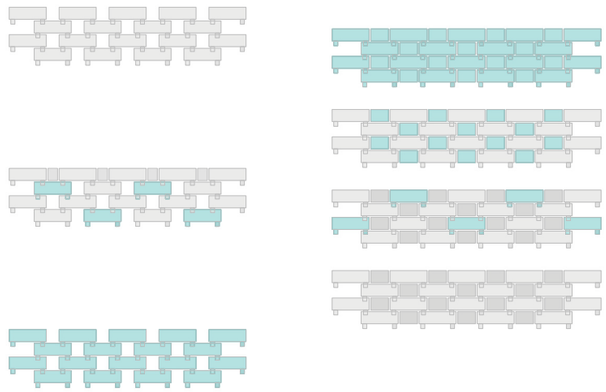
Seasonality for nonhuman habitation



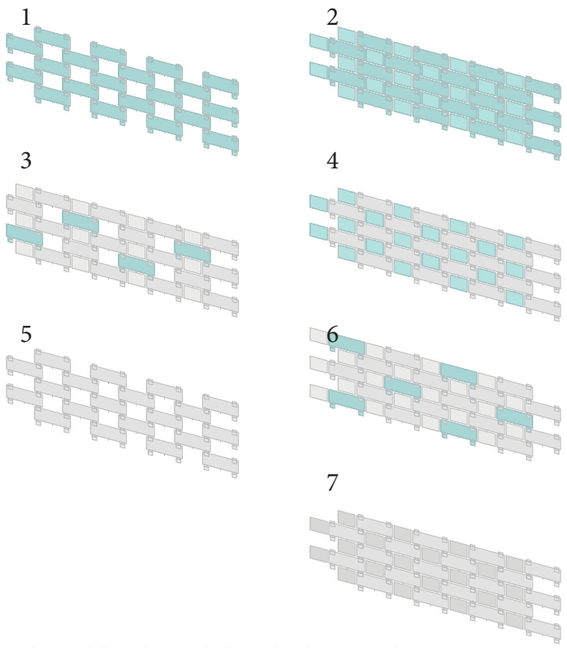
Workshop Typology Detail 1:20



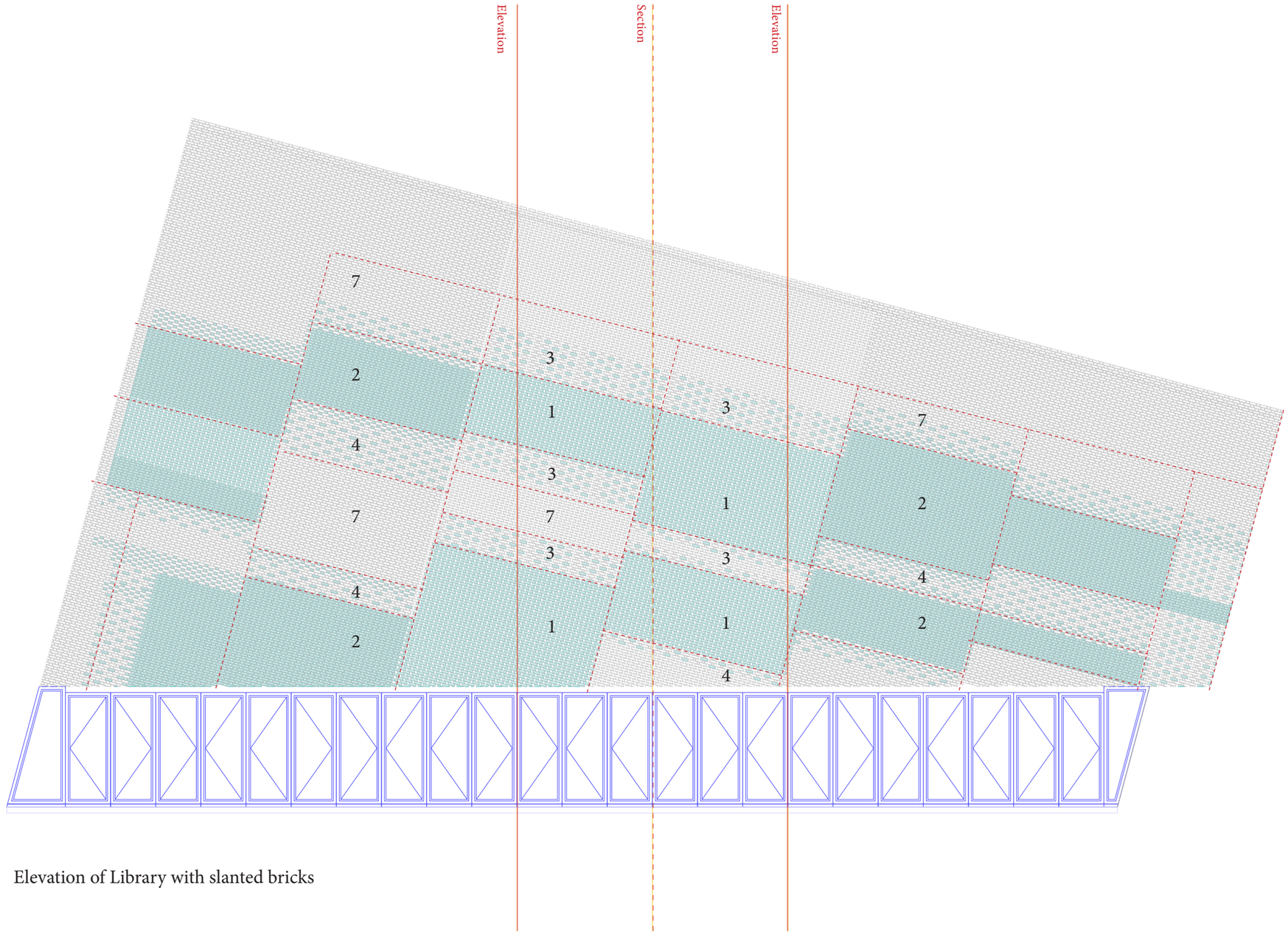
Brick System 2: Framing moments with Slanted Interlocking Brick



Design Process for dissolving bricks



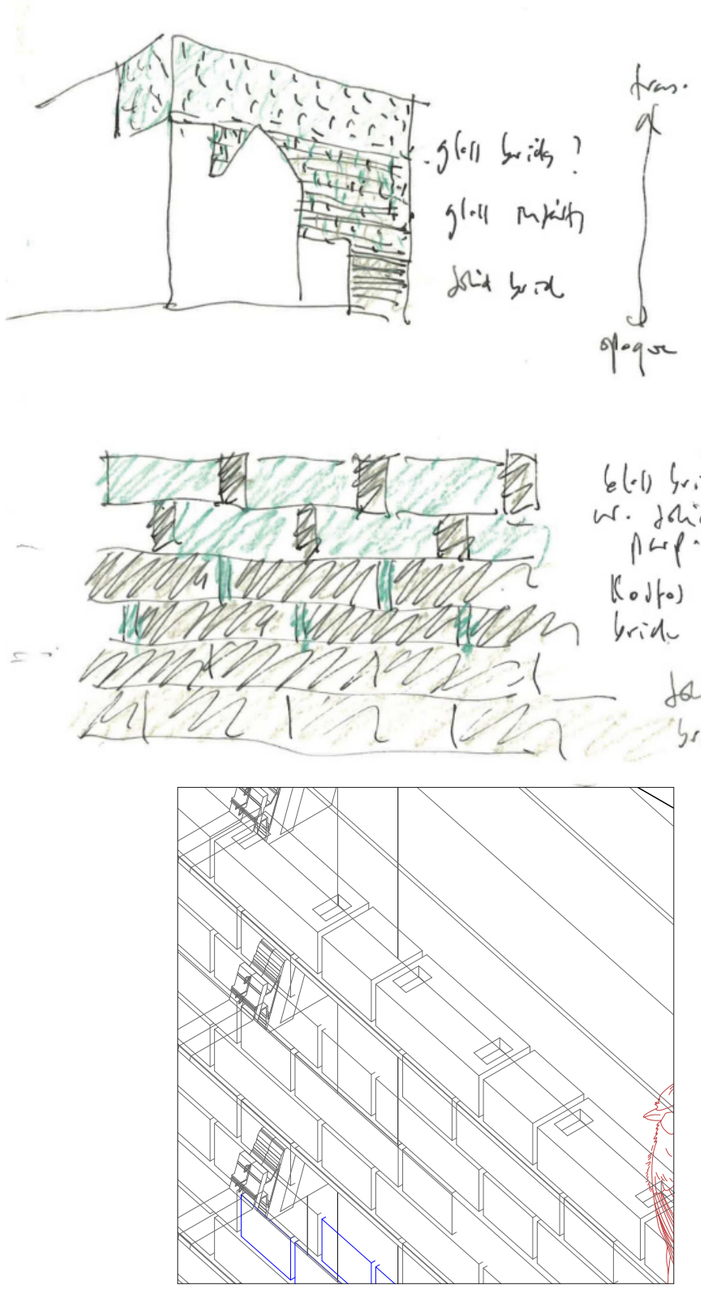
Slanted Bricks with Interlocking application

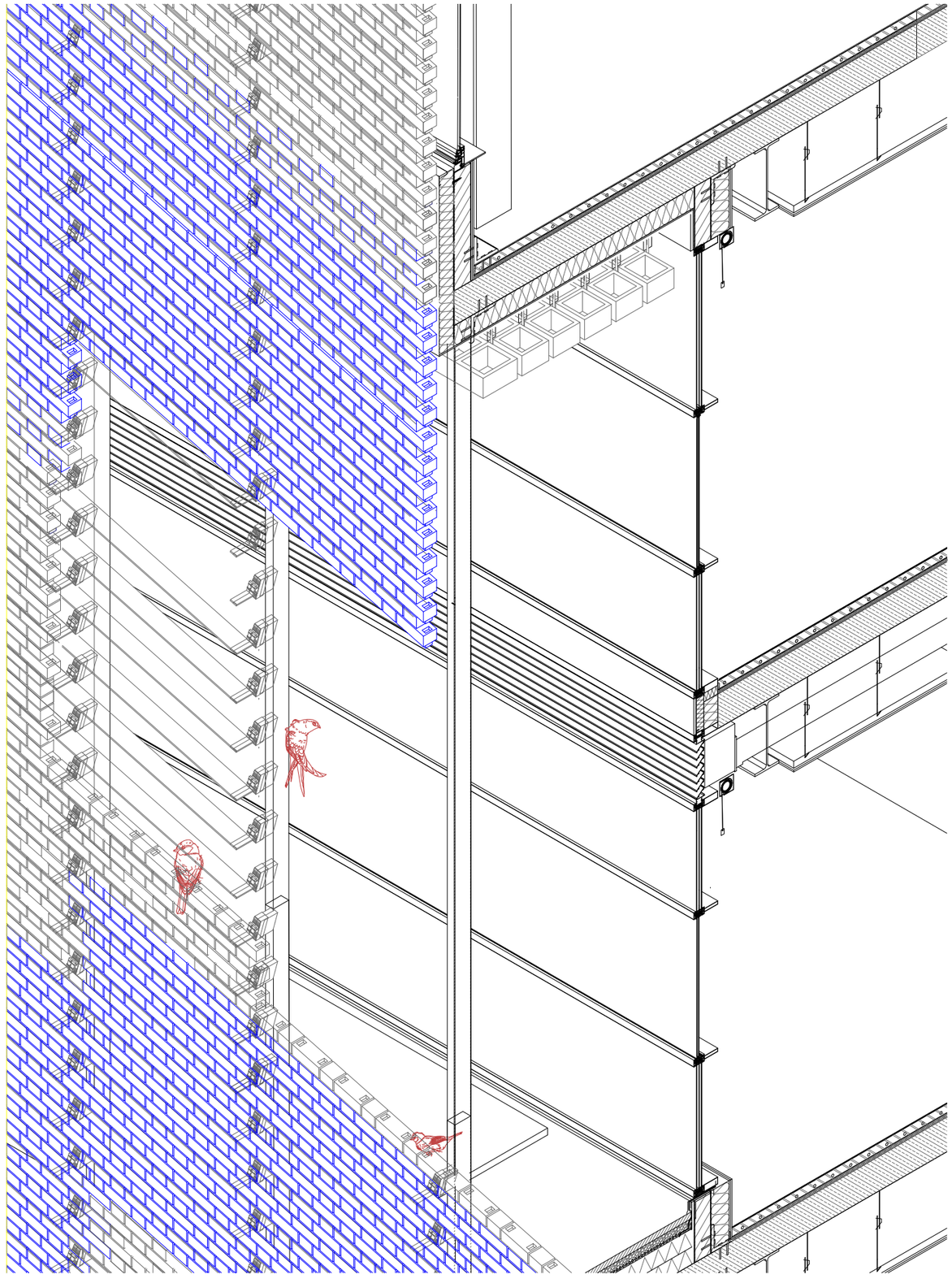


Elevation of Library with slanted bricks

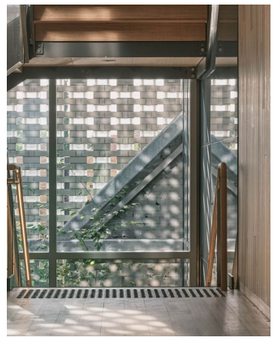
Brick System 2: Bricks dissolves...

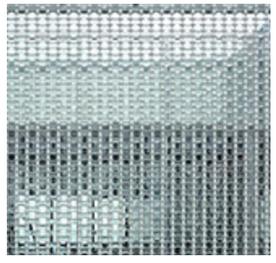
From transparency to opacity across the facade

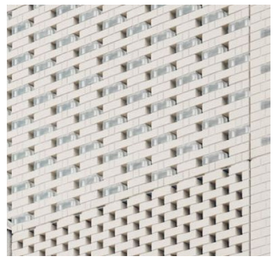




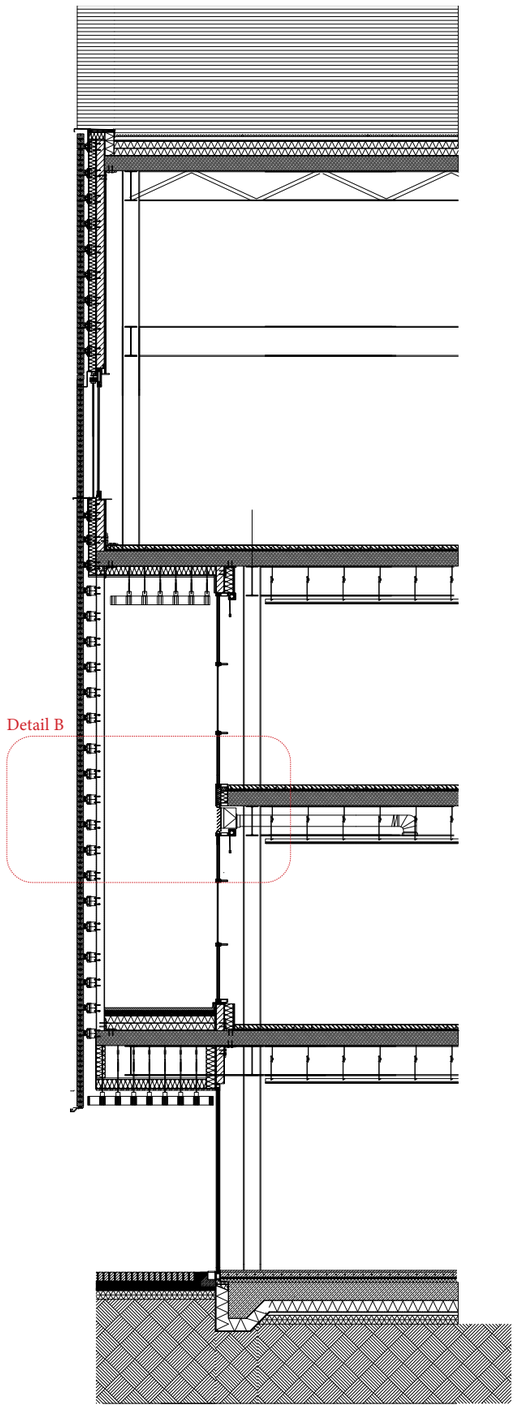
Brick System 2:

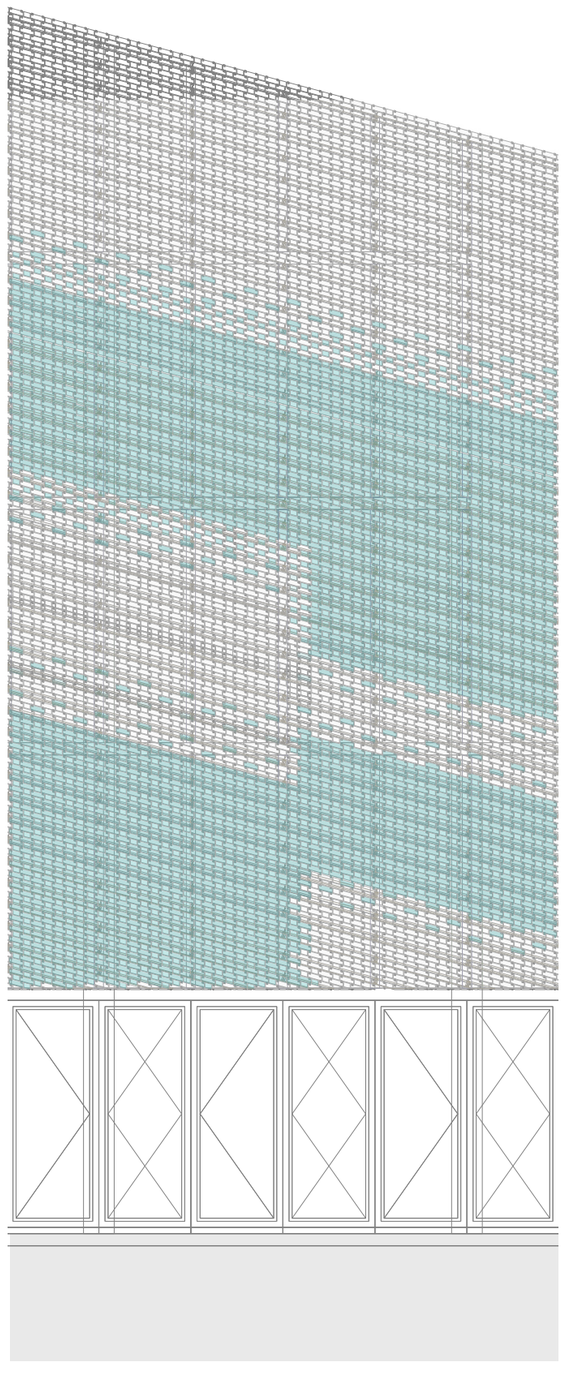


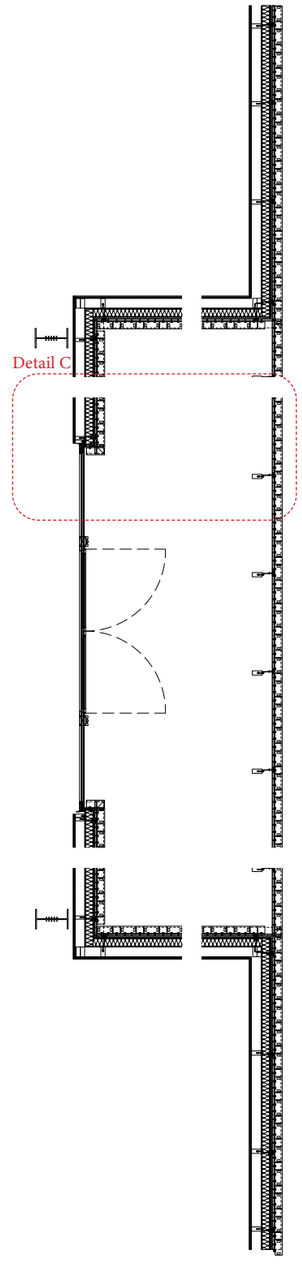




In Sundholm, a material gradient from solid brick to glass embodies the district's evolution—bridging its industrial past with a transparent, inclusive future. This approach reflects Sundholm's shift from its early 20th-century institutional roots, such as the 1908-built Maskinhallen , to a contemporary hub for art, design, and community engagement.

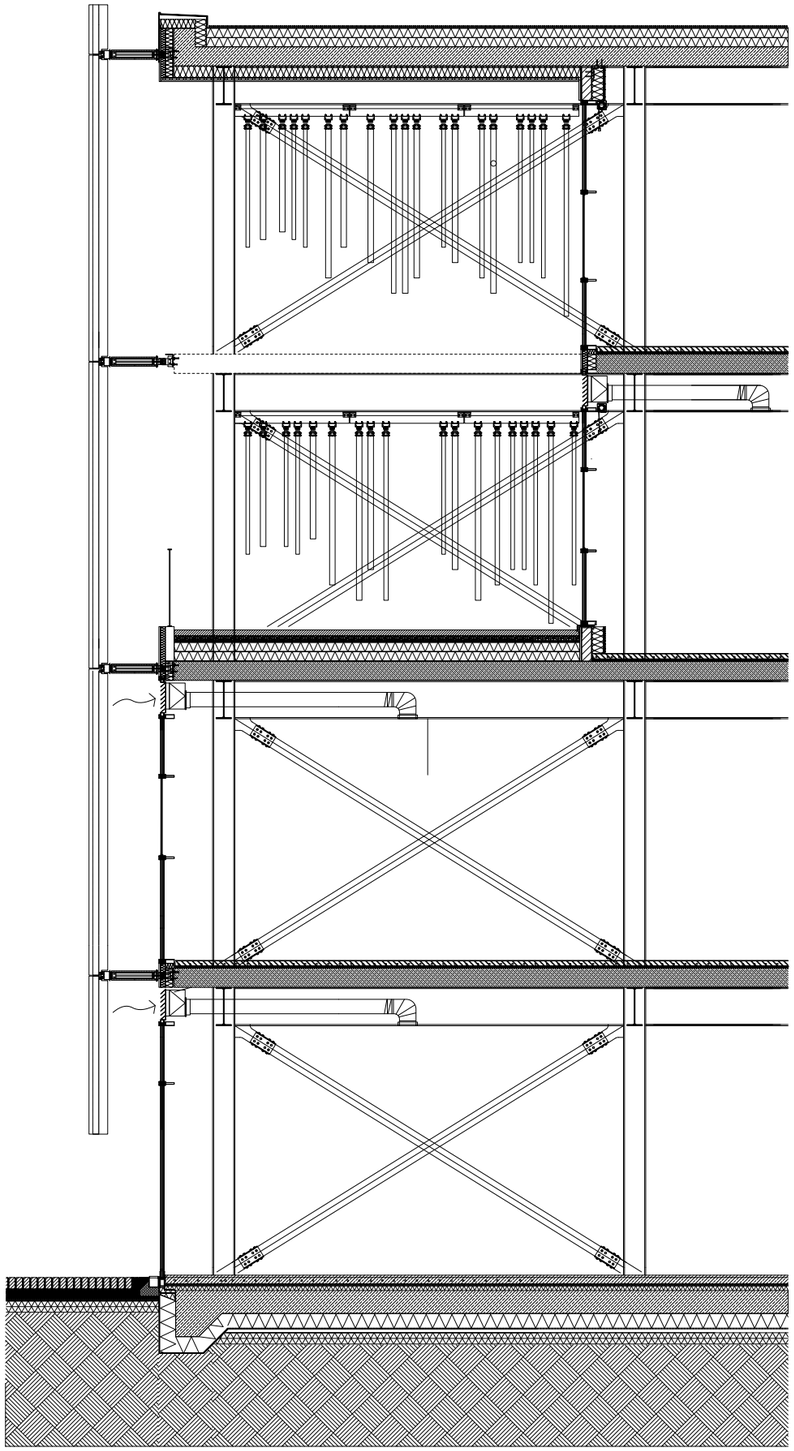


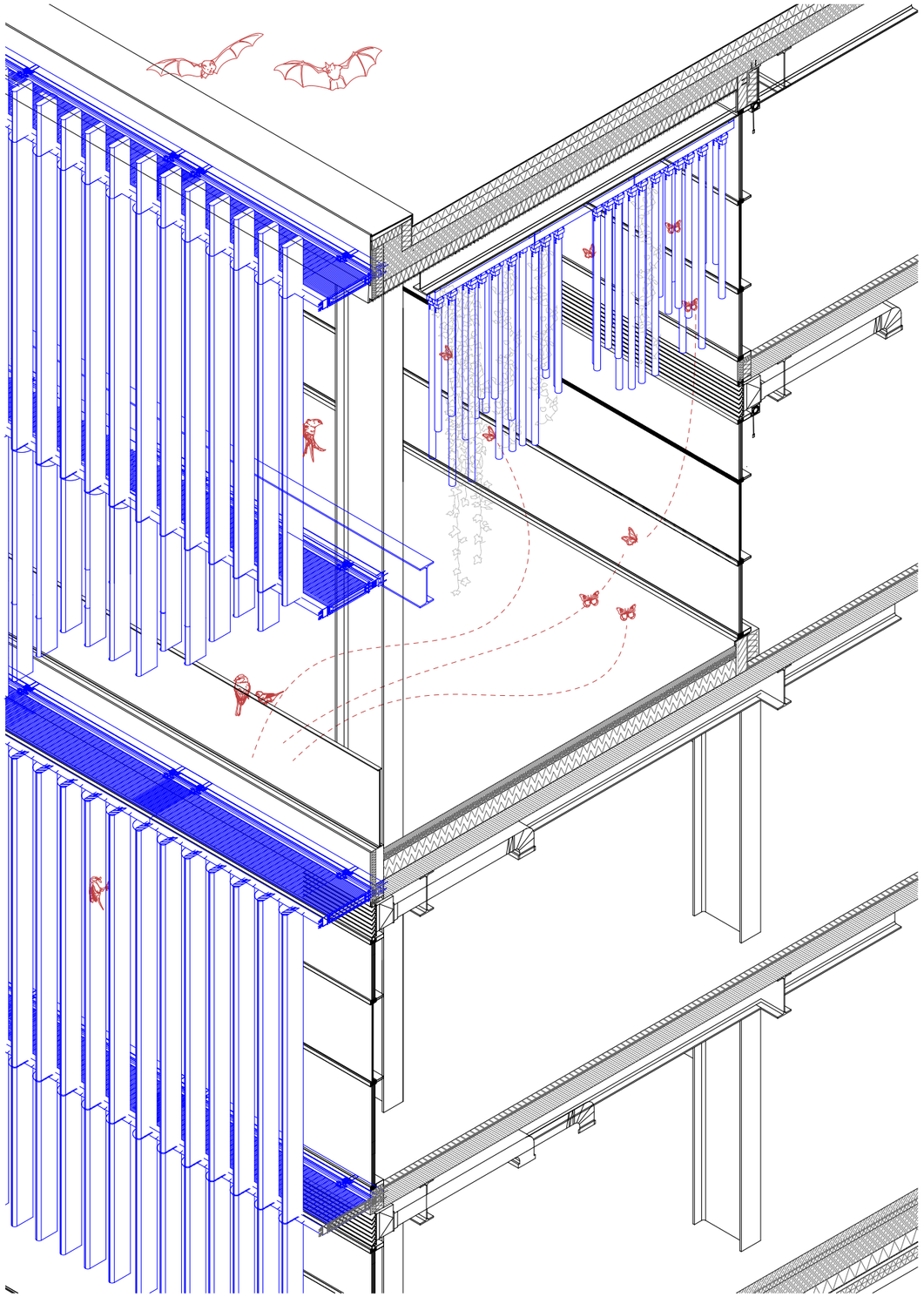




Animal Aided Design

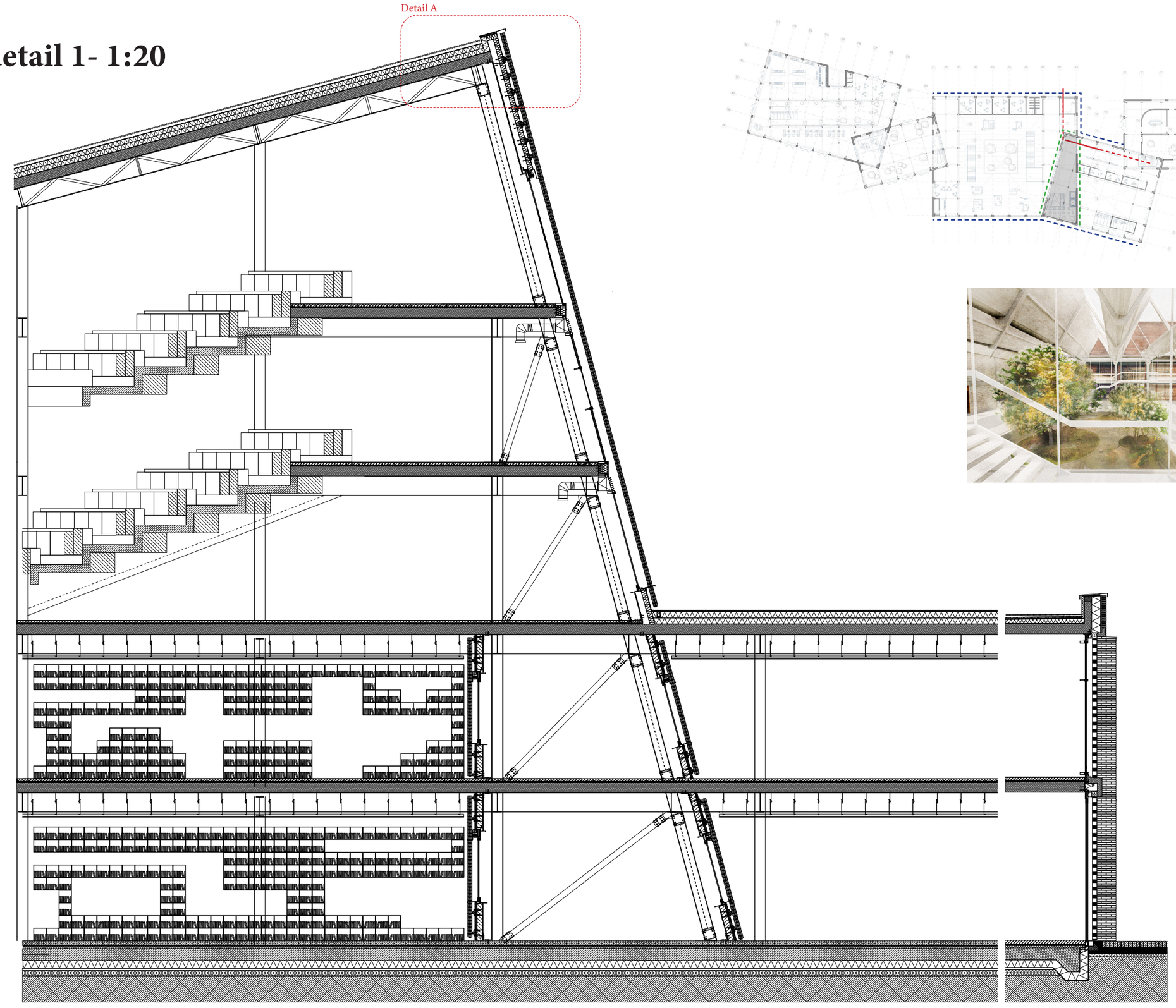
The aluminum façade of the biodiversity tower forms an in-between space—sheltered yet breathable—where butterflies can rest and overwinter. Designed using animal-aided design principles, the structure blends architecture and ecology to support urban biodiversity.

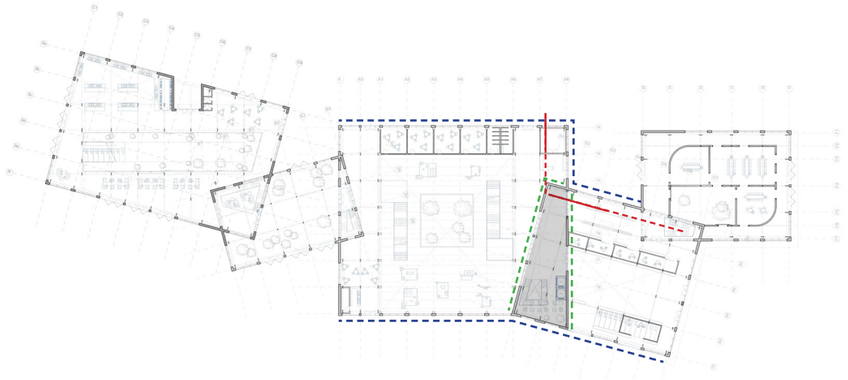




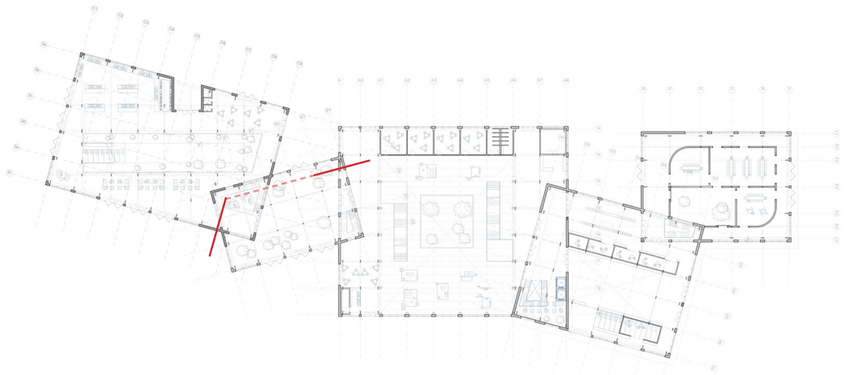
Ferrari (Tzu-Shou) Huang

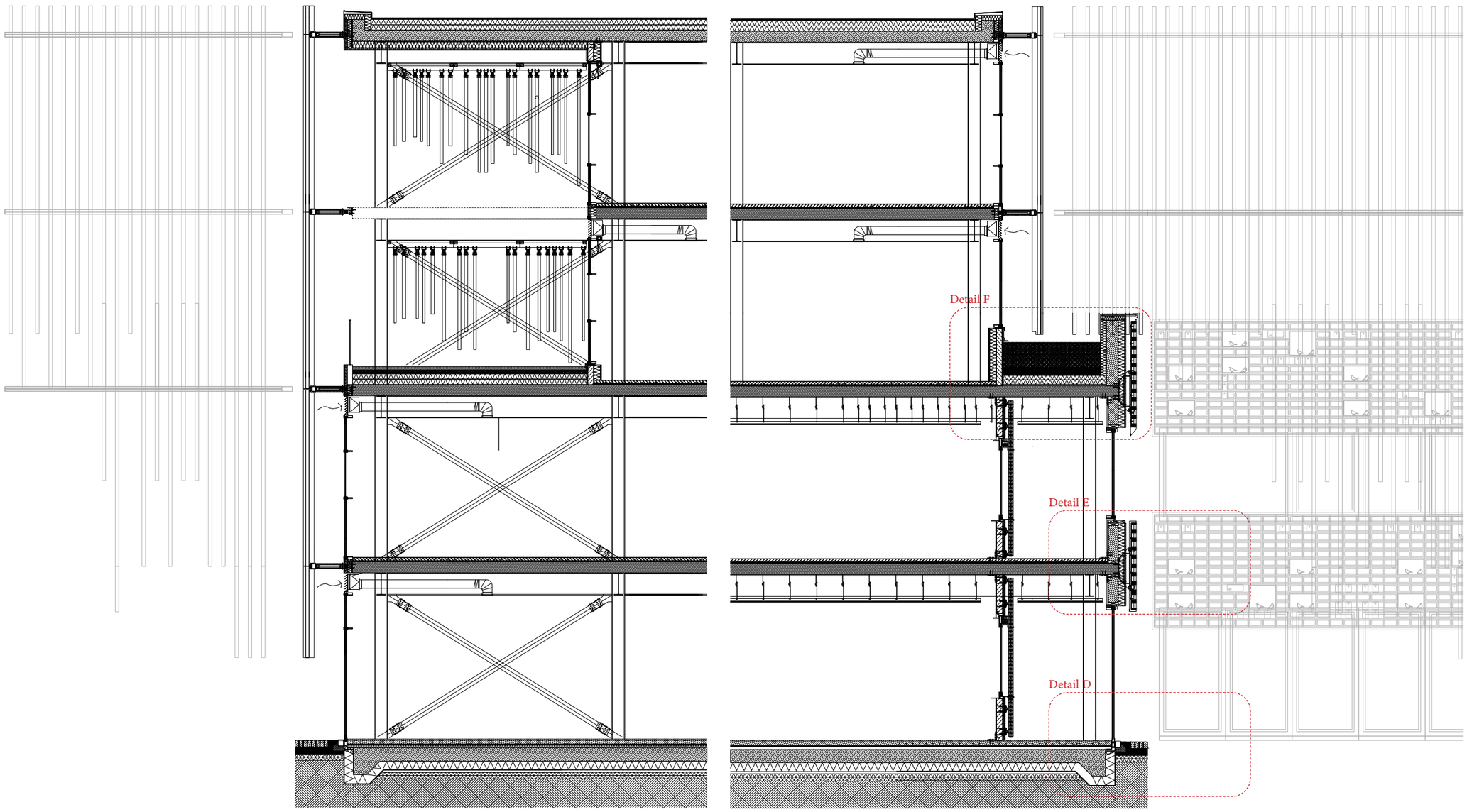
Junction area detail 1- 1:20





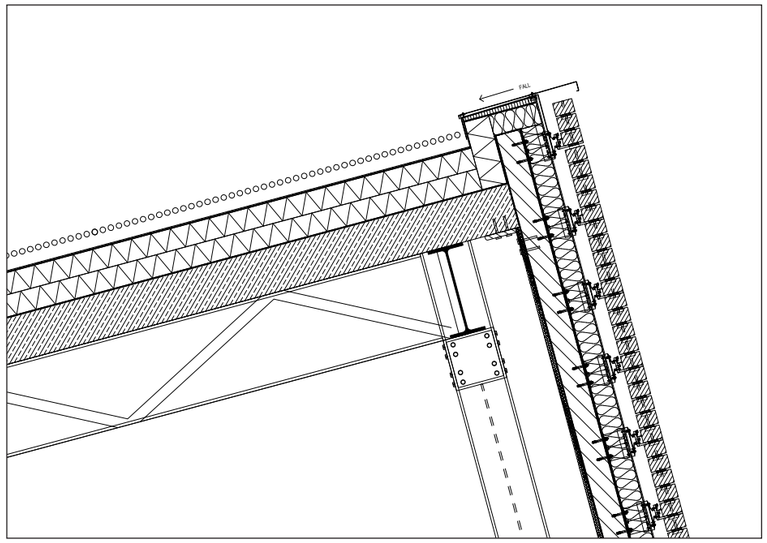
Junction area detail 2-1:20





Detail 1:5 and annotations

Detail A: Library Roof



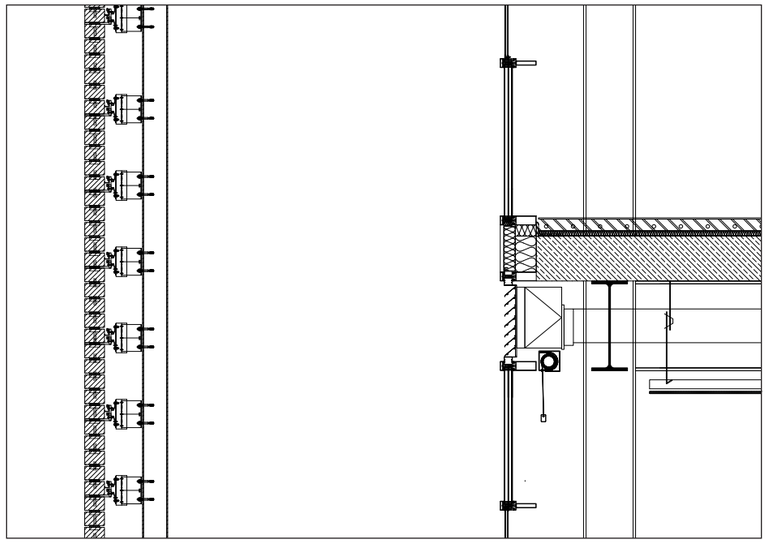
Roof Construction:(Top to bottom)

1. Gravel ballast (50 mm)
2. Geotextile filter membrane
3. Root-resistant waterproofing membrane
4. 120 mm PIR insulation
5. Bituminous vapor control layer
6. Tapered insulation to falls (min. 1:80)
7. 250 mm reinforced concrete composite slab
8. Fireproof-coated steel primary beam
9. Fireproof-coated secondary steel beam
10. Steel cross bracing
11. Suspended ceiling system
12. Double 12.5 mm fire-rated plasterboard
13.3 00 mm service zone

Facade Construction: (Exterior to Interior)

1. 230 × 110 × 76 mm Masonry Bricks / Glass Bricks (I = 800–1500 mm)
2. Stainless Steel Clasps / Wall Ties (brick-to-structure fixing)
3. 80 mm Ventilated Cavity (rainscreen zone for ventilation)
4. Breather Membrane (weather-resistant barrier over insulation)
5. 120 mm Non-Combustible Mineral Wool Insulation (façade-rated insulation)
6. 150 mm Steel Stud Framing @ 500 mm Centres
7. Acoustic/Mineral Wool Infill Between Studs
8. 10 mm Exterior-Grade Board Sheathing (Cement Board)
9. Air and Vapor Control Membrane (AVCL) (taped and sealed)
10. Service Zone (25–50 mm Battens) (optional, for accommodating services)
11. 2 × 12.5 mm Fire-Rated Gypsum Board

Detail B: Library mid-floor



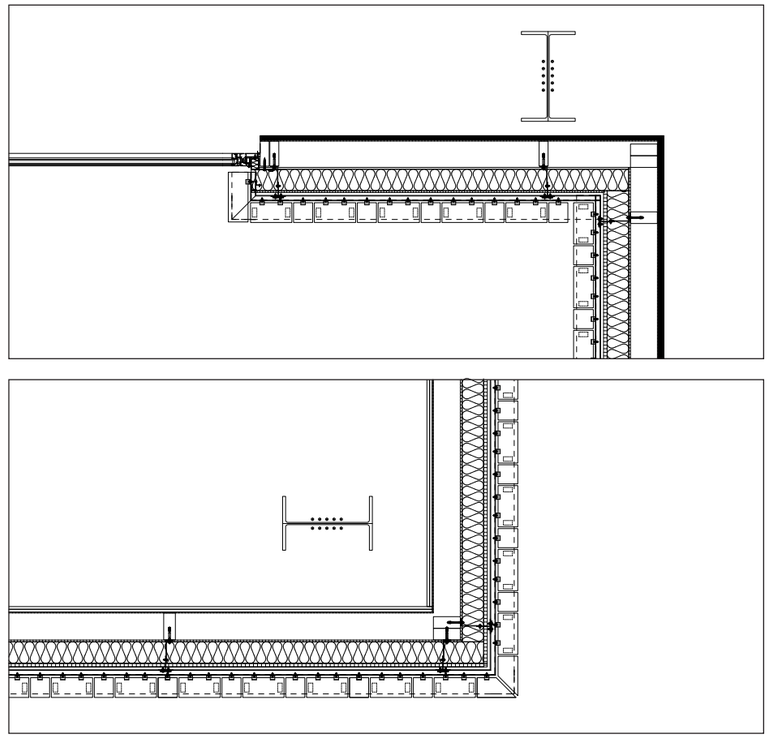
Window:

Double laminated insulating glass unit (IGU):
2 × 8 mm laminated float safety glass + 16 mm air cavity + 12 mm float glass
Low-E coating on inner pane
Thermally broken aluminium frame
Perimeter air seal and insulated cavity closers around frame

Mid floor construction: (Top to bottom)

1. 60 mm Anhydrite Screed with Underfloor Heating System on PE Foil
2. 20 mm EPS Thermal Insulation
3. 25 mm Acoustic or Thermal Insulation
4. 250 mm Reinforced Concrete Structural Floor Slab
5. Fireproof-Coated Steel Beam (integrated with or supporting slab)
6. 600 mm Suspended Ceiling System
7. Inflow Vents (Fresh Air) / Perimeter Plenum Between Suspended Ceiling

Detail C: Floorplan detail of library



Facade Construction: (Exterior to Interior)

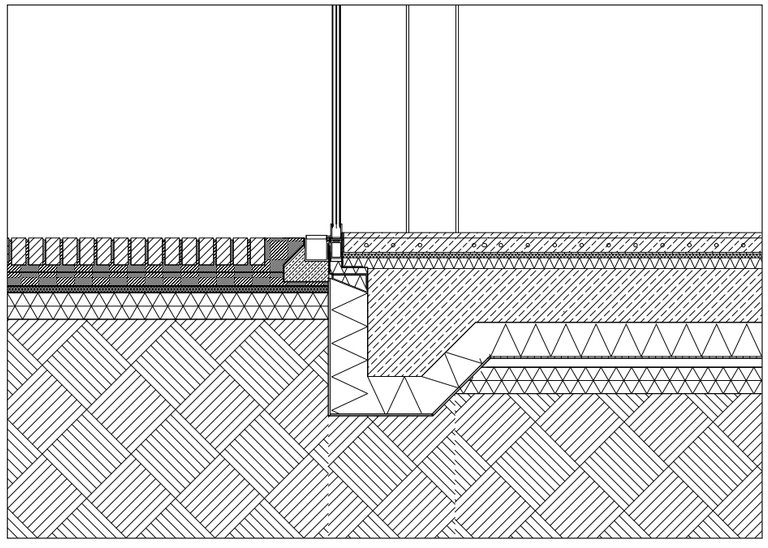
1. 230 × 110 × 76 mm Masonry Bricks / Glass Bricks (I = 800–1500 mm)
2. Stainless Steel Clasps / Wall Ties (brick-to-structure fixing)
3. 80 mm Ventilated Cavity (rainscreen zone for ventilation)
4. Breather Membrane (weather-resistant barrier over insulation)
5. 120 mm Non-Combustible Mineral Wool Insulation (façade-rated insulation)

Facade Construction: (Exterior to Interior)

1. 150 mm Steel Stud Framing @ 500 mm Centres
2. Acoustic/Mineral Wool Infill Between Studs (optional, recommended for soundproofing)
3. 10 mm Exterior-Grade Board Sheathing (Cement Board)
4. Air and Vapor Control Membrane (AVCL) (taped and sealed)
5. Service Zone (25–50 mm Battens) (optional, for accommodating services)
6. 2 × 12.5 mm Fire-Rated Gypsum Board

Detail 1:5 and annotations

Detail D: sameoundation for all typologies



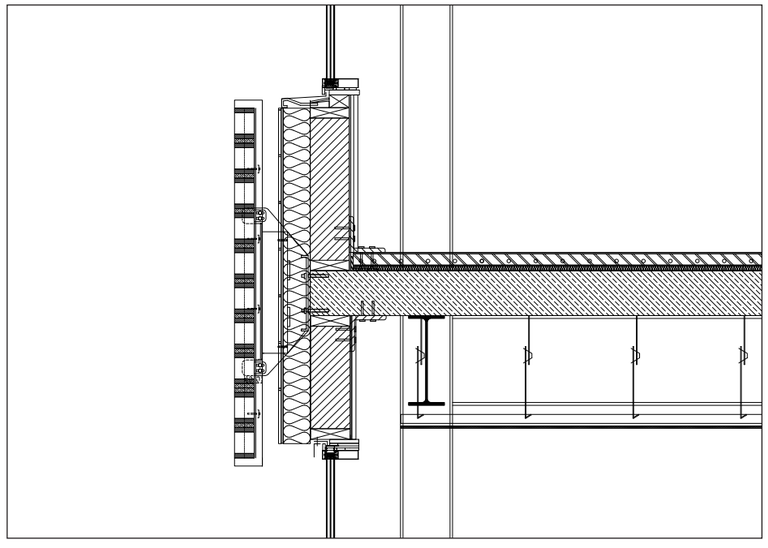
Ground Floor (Exterior) Construction (Top to Bottom)

1. 250/115/65 mm Clinker Blocks Laid on Edge
2. 50 mm Sand Binding Layer (for stability and leveling)
3. 150 mm Hardfill (compacted sub-base material for load-bearing
4. 150 mm Exterior Drainage Channel (sloped at 2° away from building for water runoff)
5. 300 mm In-Situ Concrete Slab (structural floor slab)
6. Reinforcement @ 300 mm Centers, 25 mm Cover (reinforcing steel mesh or bars)
7. Damp Proof Membrane (DPM) (underlay for moisture control)

Groundfloor finish (interior) (Top to Bottom)

1. 30+80 mm Reinforced Hardened Concrete with Underfloor Heating PE Foil
2. Vapor Barrier
3. Soundproofing Matting
4. 60 mm PUR Thermal Insulation
5. 300 mm Reinforced Concrete
6. 150-190 mm Rigid Wool Thermal Insulation
7. Edge Insulation Around Perimeter
8. Expansion Joints

Detail E: Brick system 1: Panels System



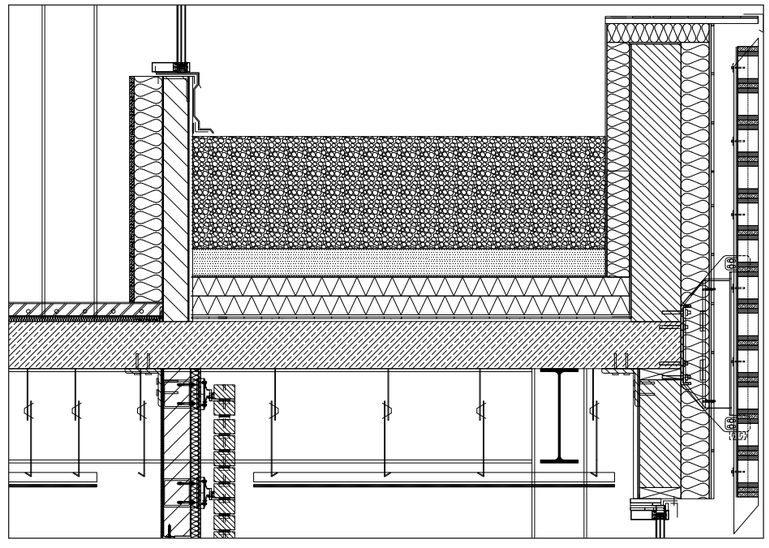
Biodiversity Pannel system (exterior to interior)

1. 240/115/170 mm Open Clinker Blocks with 30 mm Reinforced Joints
2. 25/75/4 mm Stainless-Steel Angles fixed to reinforced concrete with stainless-steel brackets
3. 15 mm Ceramic Tiles (250/65 mm) with tile adhesive
4. 70 mm Screed Separating Layer
5. 30 mm XPS Insulation
6. 200 mm Reinforced Concrete Floor with Ribs (470 mm deep)
7. 120 mm Mineral-Wool Insulation Mortar Layer
8. Vapor Barrier
9. Drainage Layer
10. Back Ventilation Cavity

Mid floor construction: (Top to bottom)

1. 60 mm Anhydrite Screed with Underfloor Heating System on PE Foil
2. 20 mm EPS Thermal Insulation
3. 25 mm Acoustic or Thermal Insulation
4. 250 mm Reinforced Concrete Structural Floor Slab
5. Fireproof-Coated Steel Beam (integrated with or supporting the slab)
6. 600 mm Suspended Ceiling System
7. Inflow Vents (Fresh Air) / Perimeter Plenum Between Suspended Ceiling

Detail F: Junction between Bio facade and communal green roof



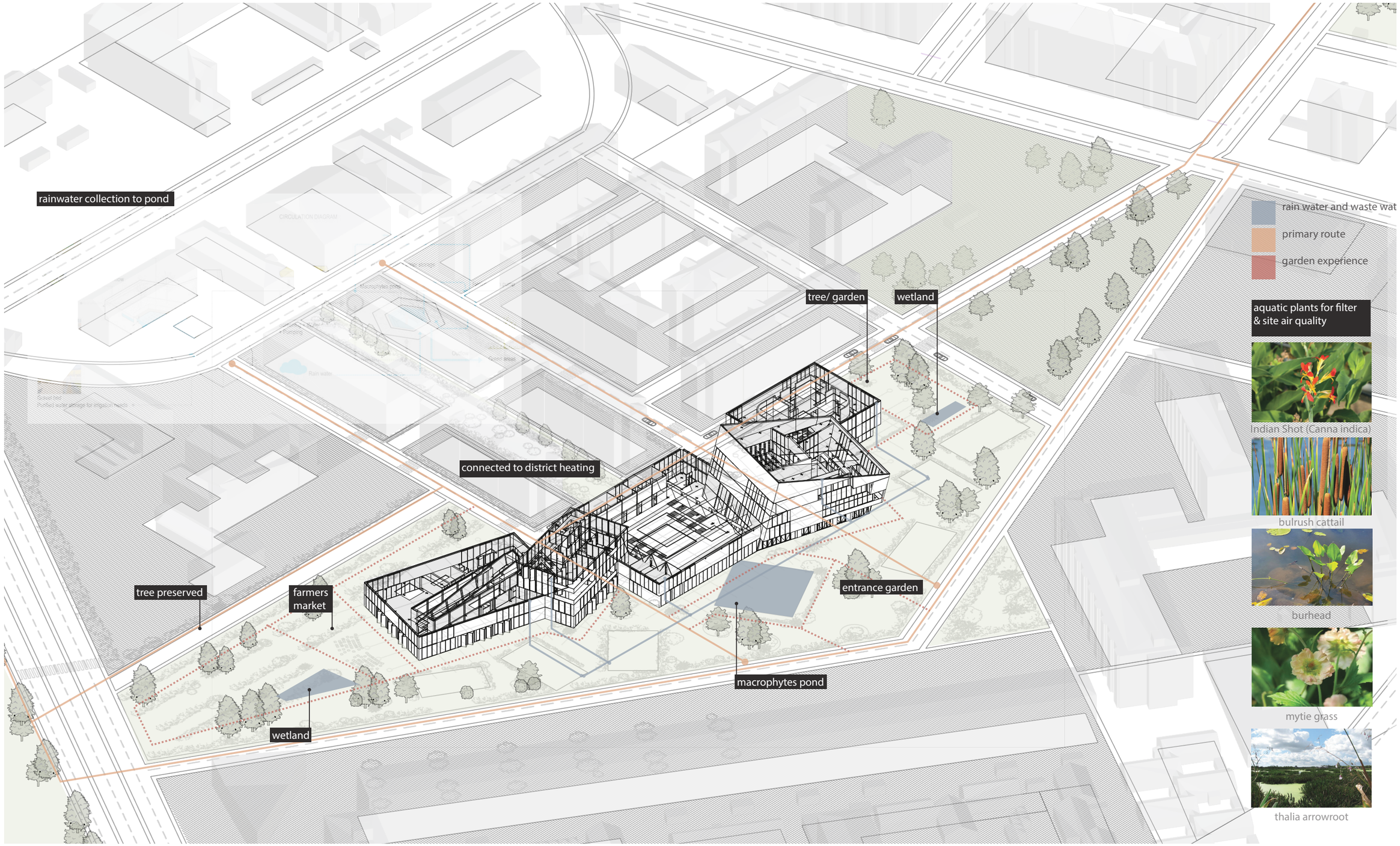
Junction Interior wall (out to in)

1. 230/110/76 Masonry Bricks / 230/110/76 Glass Bricks (I = 800–1500 mm)
2. 50 mm Cavity
3. Stainless Steel Clasps
4. Back Ventilation
5. 9 mm Fibre Cement Panel
6. 50 mm Insulation
7. 150 mm Steel Stud Framing @ 500 mm Centers
8. 10 mm Board Sheathing with Air & Vapor Barrier Membrane
9. Acoustic Insulation (between steel studs)
10. Firestopping (around penetrations and joints)
11. Sealing Tapes for Air-tightness (around joints and seams)

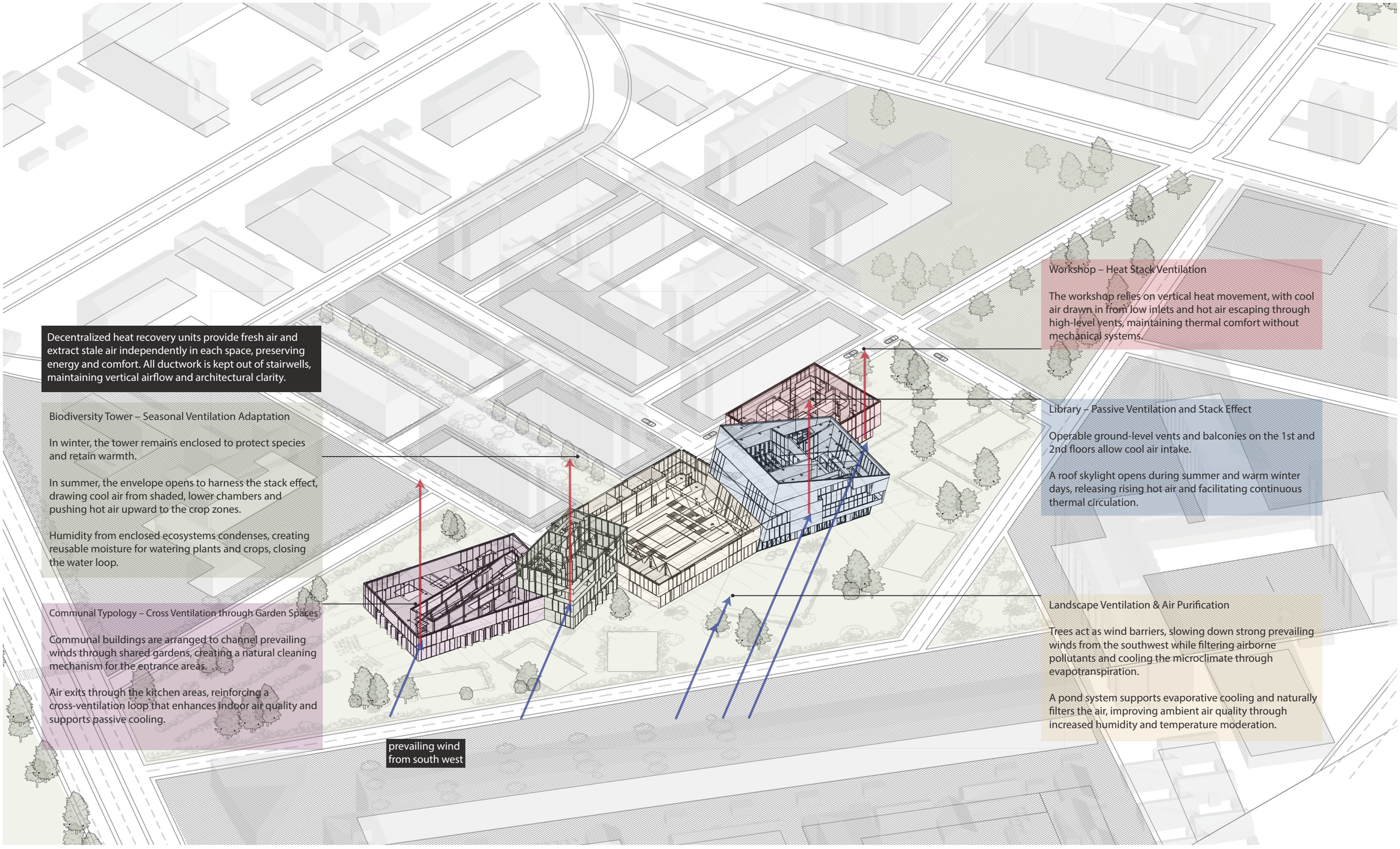
Green Roof Construction:(Top to bottom)
1. Vegetation Layer (shrubs, small trees, and perennials)
2. 500 mm Soil Substrate (supporting plant growth)
3. 2 mm Filter Fabric (prevents soil migration into drainage layers)
4. 100 mm Gravel Drainage Layer (ensures proper drainage and prevents waterlogging)
5. Root Barrier (optional, placed above the waterproofing membrane to protect it from plant roots)
6. 6 mm Waterproofing Membrane (EPDM) (prevents water infiltration into the underlying structure)
7. 150 mm Thermal Insulation (XPS Extruded Polystyrene) (provides thermal insulation to the building)
8. Vapor Barrier (prevents moisture migration into the building structure)
9. 250 mm Reinforced Concrete Slab (structural support for the green roof)
10. Drip Irrigation System (optional, for maintaining plant health in the green roof)

Pre-planted Modules (optional, for quicker green roof establishment)

Landscaping experience & an circular economy



Human Comfort- Ventilation and Heating



Biodiversity plans and regulations are being implemented globally but **how do we track biodiversity**

real impact, both locally and worldwide?

Our Stories begins with a *Seed*
Library-City, a place to nurture, play and learn

Libellula saturata: 0.93

Tracking Biodiversity “Sensing Garden”

MIT Senseable lab

B++

Insects as proxies of biodiversity

senseable city lab.

Ferrari (Tzu-Shou) Huang

Vision

Urbanization and climate change have driven **biodiversity decline**.

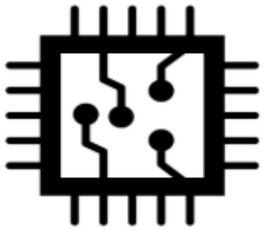
There has been a reported 69% decrease in biodiveristy since 1970, leading to a global ecological crisis.

Currently, biodiversity is tracked using manual methods such as field surveys, traps, and specimen collection... However, this new AI-powered tracking device enables cities, citizens, and industries worldwide to monitor biodiversity in real time using edge AI technologies

Process

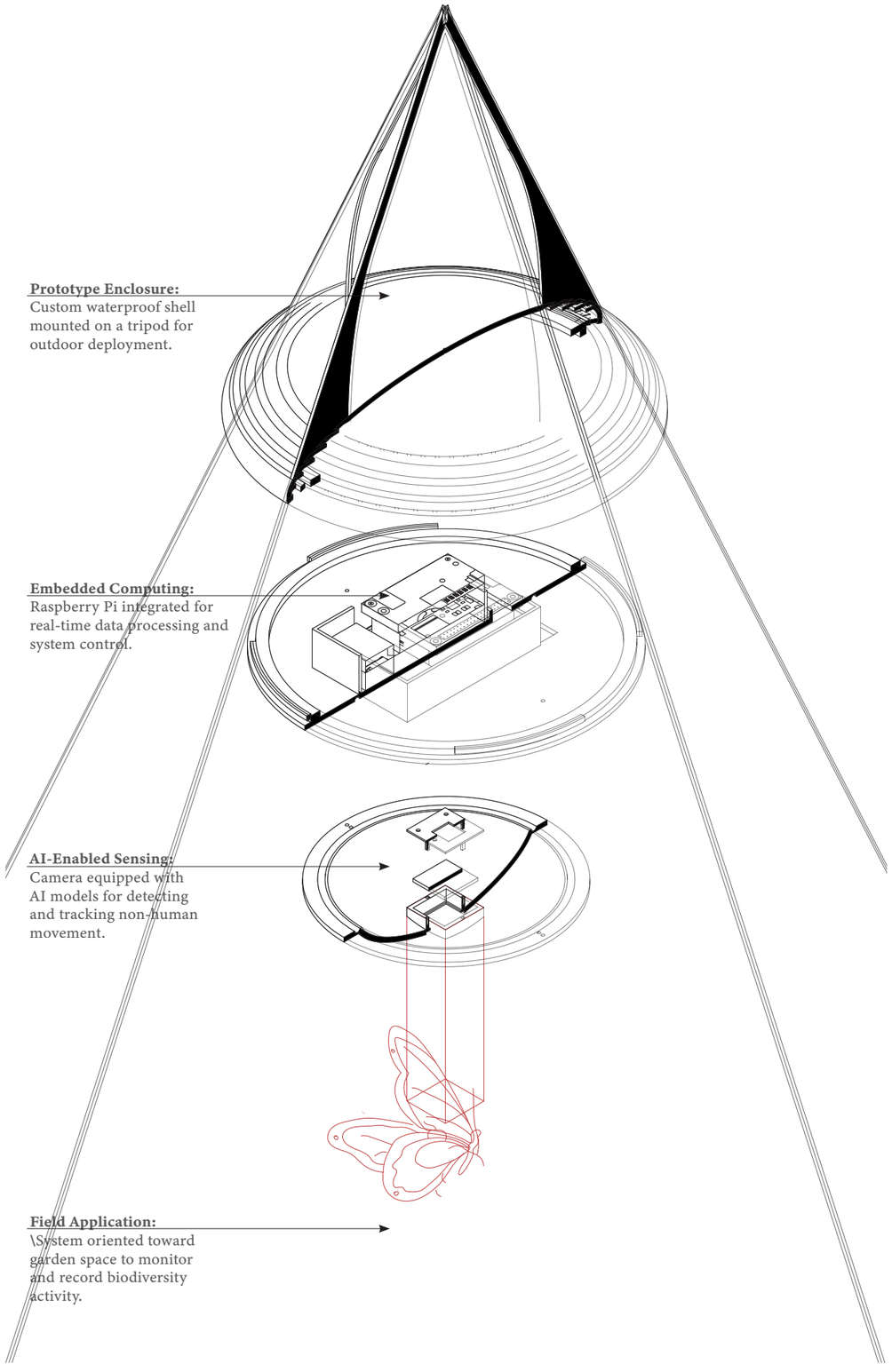
AI insect detection and classification

Hardware setup



Ecological design

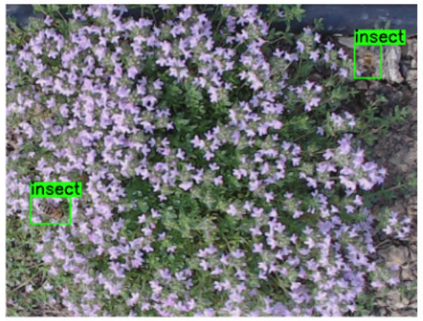
Prototype Design for the Sensing Garden



The prototype is suspended above a garden, where it detects the types of biodiversity present. By understanding what species are present and what's missing, it can recommend specific plants to attract the necessary wildlife. This offers valuable insights into urban ecological health and supports the creation of more sustainable, inclusive urban environments—encouraging a more hands-on approach to urban ecology through workshops and community engagement.

One stage: GBIF with bounding box

Two stage: generic insect model + blurred GBIF as classification data



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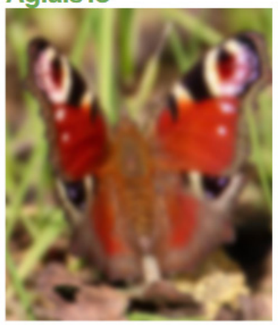

Prototype Implementation into Built Environment

Hard material workshops are used to fabricate modular bird-friendly facades, which can be distributed throughout the neighborhood.

a prototype is implemented into each of the habitats, ensuring consistency in design and function.

The central library and biodiversity tower can act as a real-time data collection hub, monitoring biodiversity across various parts of the neighborhood. This data would inform the strategic placement of trees to support bird nesting and strengthen urban ecological networks.

Our Stories begins with a *Seed*
Library-City, a place to nurture, play and learn

Our Stories begins with a *"seed"*

a Public Condenser where we nurture, learn, and grow.

Ferrari (Tzu-Shou) Huang