

José I. Kempff Seleme

# Portfolio

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VENICE

**chernikhov**

**casas vivas**

MENDOZA

**glasshouse**

**uru-uru**

CHIPAYA

## foreword

Welcome to my portfolio. This document presents a curated selection of academic design work, complemented by relevant coursework and professional experience. It reflects an ongoing exploration of architecture through computational and digital methodologies.

I am a licensed architect in Spain, with a focus on computational design, building technology, and graphic communication. My work investigates how advanced digital tools—ranging from parametric modelling and programming to BIM, automation, and emerging AI-based workflows—can expand architectural thinking across scales, from conceptual design to construction and coordination.

I began my architectural education in 2015 at ETSAM (Polytechnic University of Madrid), where I developed a rigorous academic foundation under the guidance of practitioners engaged in both research and professional practice. During this time, I came to understand architecture not only as the production of buildings, but as a critical discipline integrating theory, analysis, representation, and execution.

Alongside my studies, I gained professional experience in architectural studios in Santa Cruz de la Sierra, Bolivia, which exposed me to the social, technical, and economic complexities of practice in the Latin American context. I later undertook an Erasmus+ exchange at the Technical University of Munich, further strengthening my technical and analytical skills within an international environment.

In 2023, I completed my Master of Architecture at ETSAM under the Juan Herreros Chair, with mentorship from Víctor Navarro. This degree granted me professional licensure in Spain and the EU, as well as NAAB accreditation in the United States. I subsequently collaborated with Ensamble Studio, where I engaged with construction-driven design processes and on-site coordination, reinforcing my interest in materialisation and constructive logic.

I later joined Miautics as a computational design specialist, mentoring students and professionals across multiple phases of design development and project storytelling. In parallel, I worked with Madrid-based engineering firms on national and international projects, translating analytical and technical data into coordinated BIM models while developing and optimising computational and BIM implementation workflows.

Since 2025, I have been a candidate for the MSc in Architectural Computation at the Bartlett School of Architecture (UCL), an experience that has further expanded my approach to digital tools, and design thinking.

My approach to architecture and urbanism is grounded in computational thinking as a design driver, while remaining critically engaged with architectural history, theory, and construction culture. I see digital tools not as ends in themselves, but as instruments to question, structure, and communicate architectural ideas with precision and responsibility.

# super m.a.n.

**Type:** Master's Thesis

**Location:** Madrid

**Professor:** Víctor Navarro and Juan Herreros

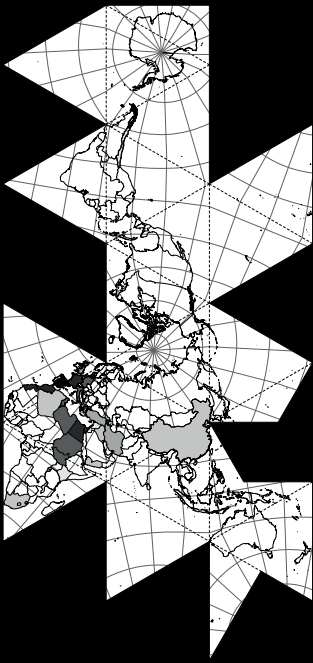
**Year:** 2022-2023

**Description:** The legacy of the museums of archeology as a type dates back to the 18th century, when kingdoms and empires were established. At a time when it is perceived that knowledge institutions are in crisis, the role of the National Archaeological Museum (M.A.N.) changes. For this, and with an anti-colonialist attitude, the museum expands its temporary exhibition spaces. Taking advantage of its location, it offers new programs that seek to mitigate the crisis that museums are experiencing today.

The project refers to heritage and tries to have the least visual influence when people are near the museum, thus respecting the environment. While when the people are far away it is a claim, appearing and disappearing with special attention to the heights of Madrid.

Current spaces are reorganized while more inclusive and diverse programs are accommodated. The museum programs are intuitively organized into separate platforms, intermediate planes and flowing boxes, which together dictate the distinctive faceted form of the project.

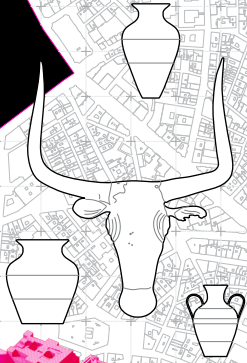




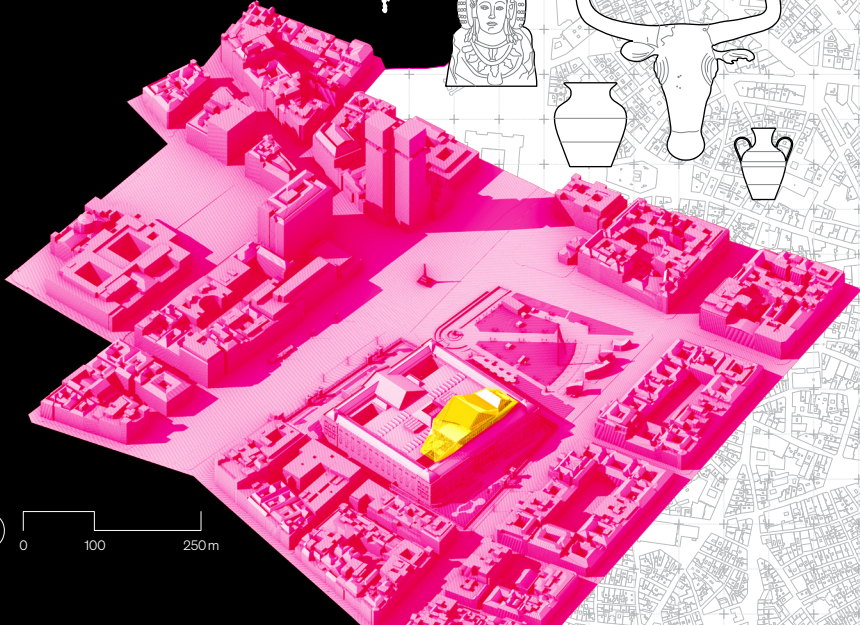
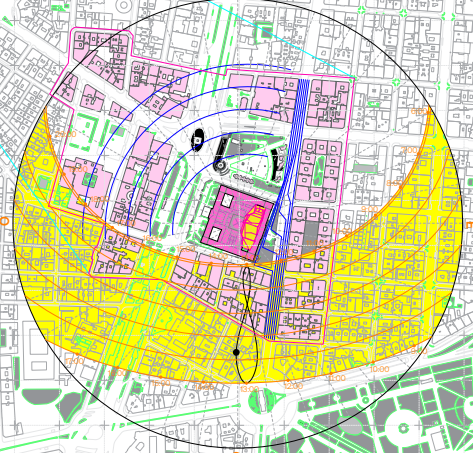
ORIGIN OF THE COLLECTION OF THE M.A.N.

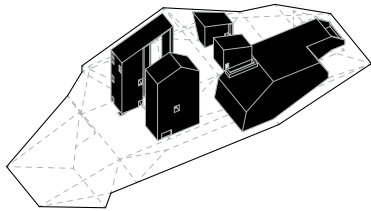


THE ESSENTIALS



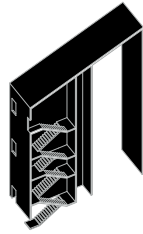
CARCAVÓN STREAM  
THE THROUGH TROUGH  
SALAMANCA/RETIRO  
CHAMBERÍ/CENTRO  
DISTRICTS





THE BOXES THAT COMPOSE  
THE INTERIOR SPACES

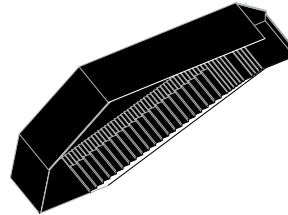
ELEVATOR CORE



CENTRAL CORE



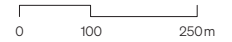
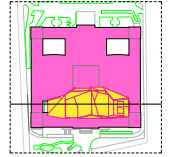
AUDITORIUM



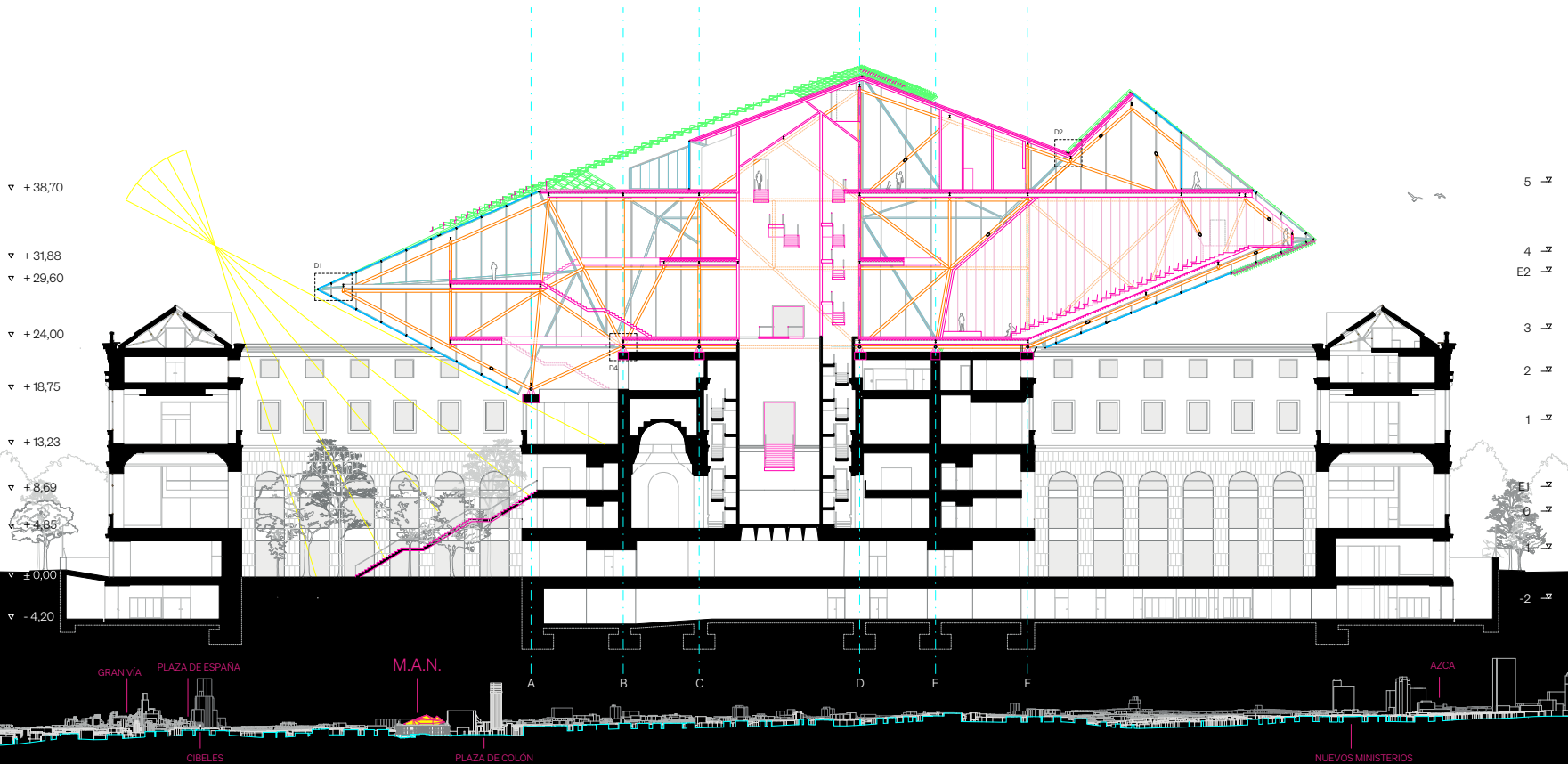
KITCHEN AND BAR

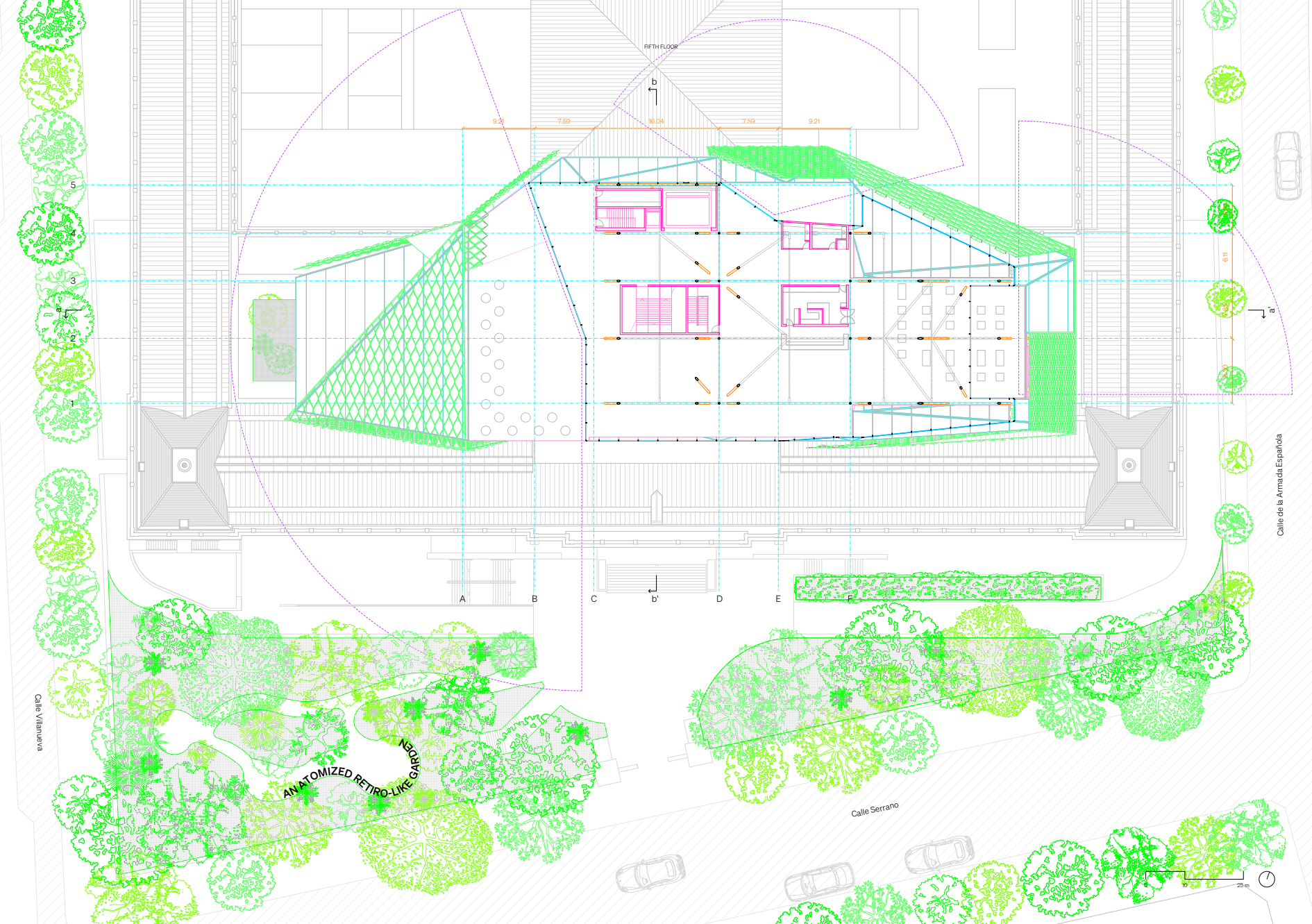


TOILETS



SECTION a-a'





FIFTH FLOOR

b

9.21

7.69

16.04

7.54

9.21

a

A

B

C

D

E

b'

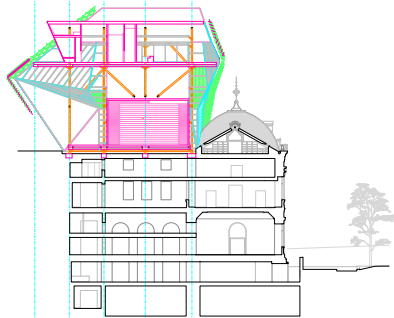
Calle Villaverde

Calle de la Armada Española

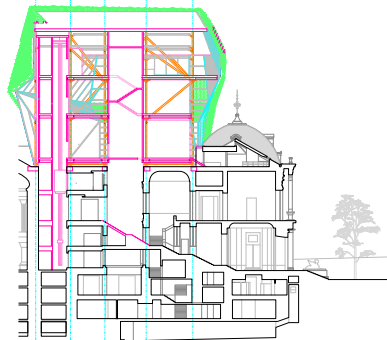
Calle Serrano

ANATOMIZED RETIRO-LIKE  
NORDBERG

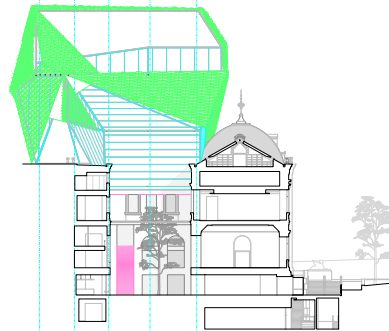
25m



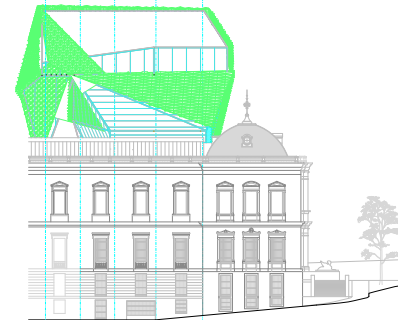
FIRST FLOOR



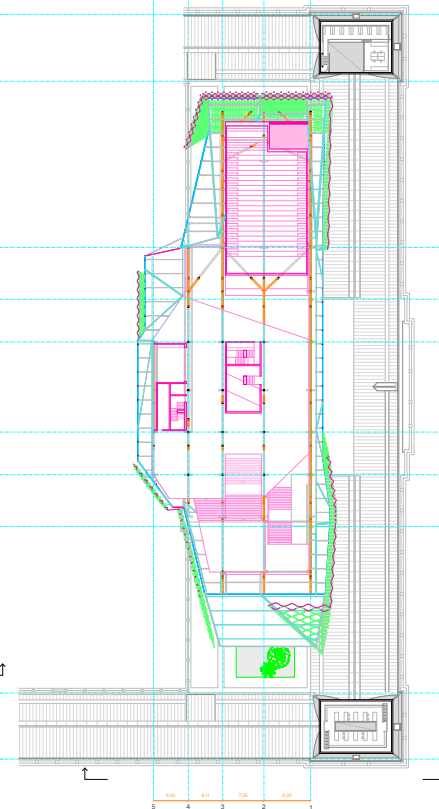
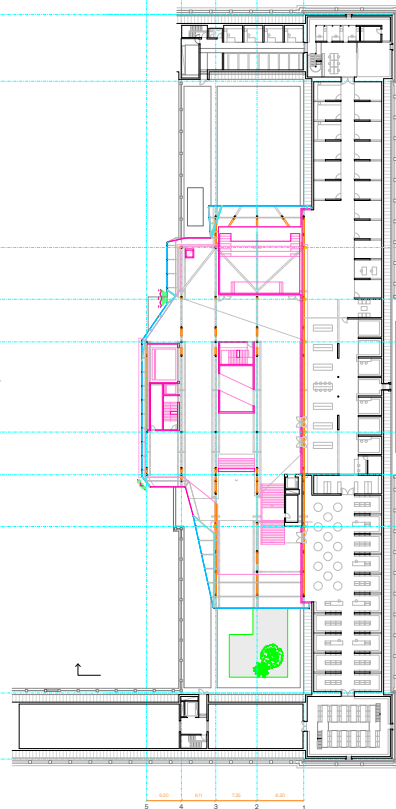
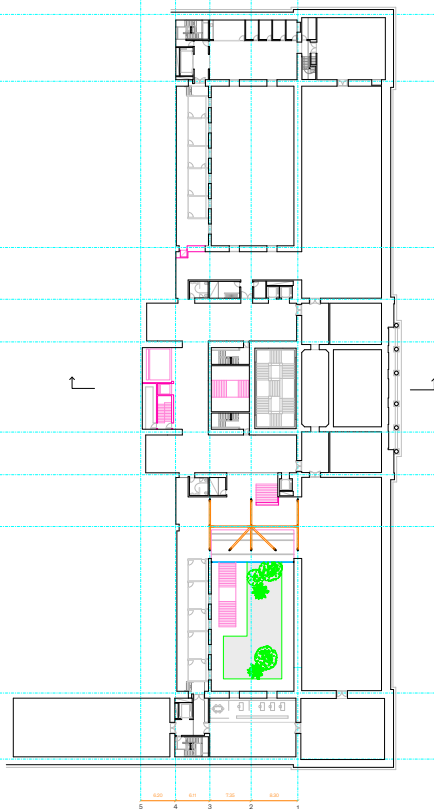
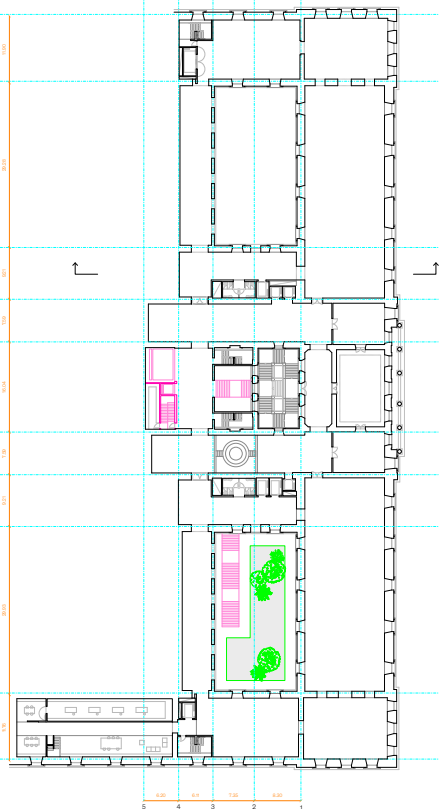
SECOND FLOOR

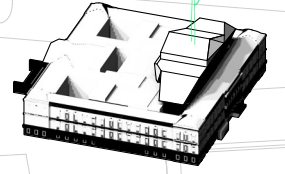
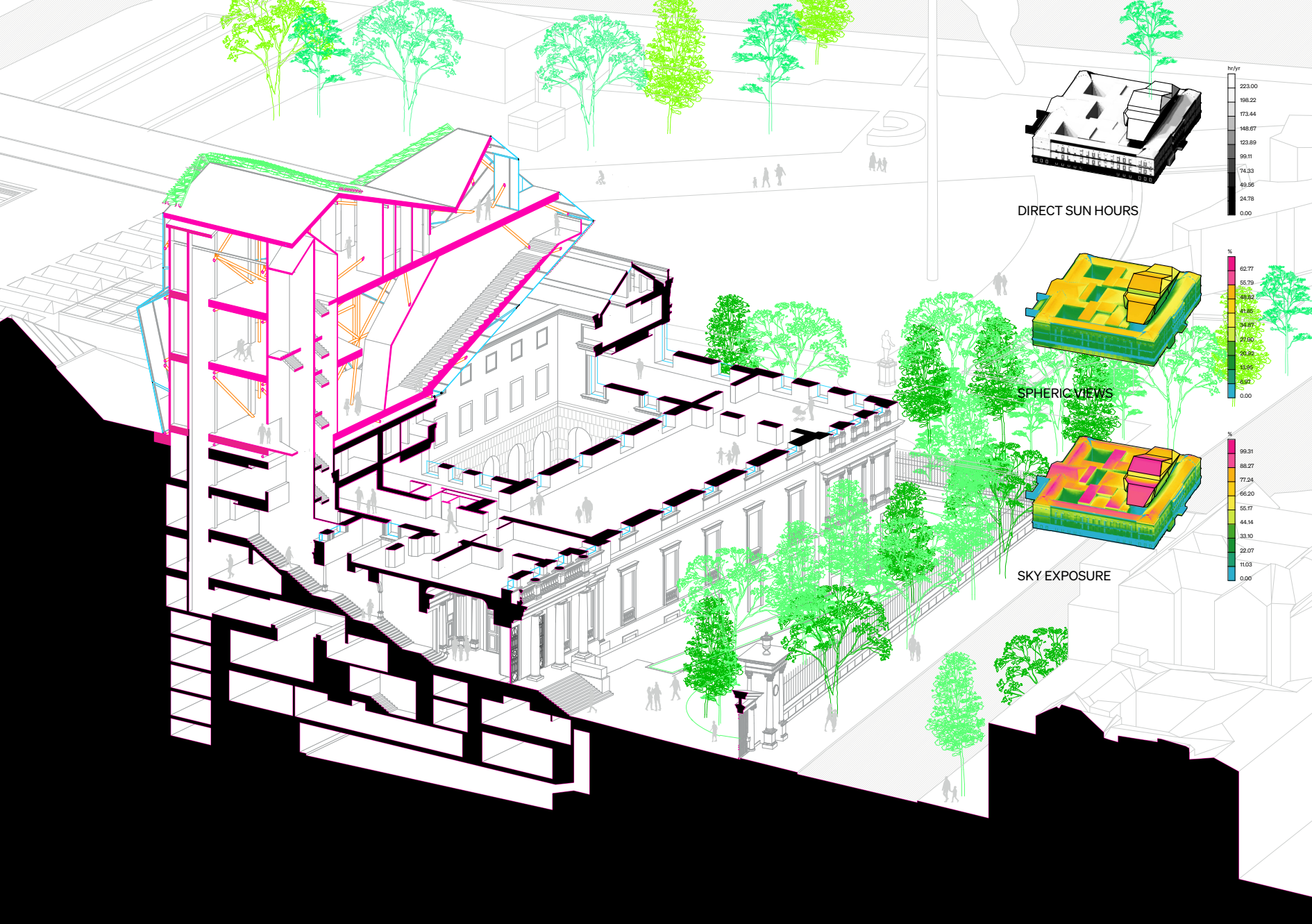


THIRD FLOOR

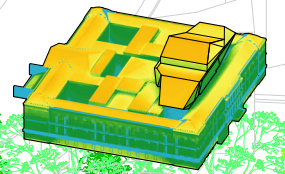
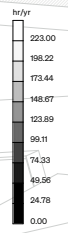


FOURTH FLOOR AND SECOND MEZZANINE

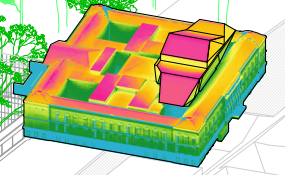
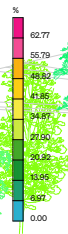




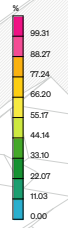
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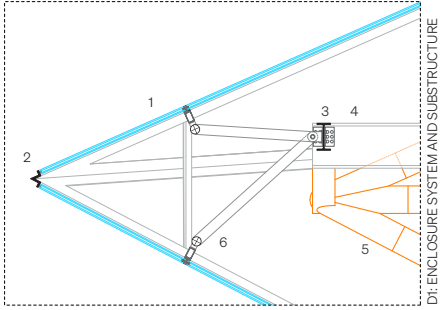


SPHERIC VIEWS



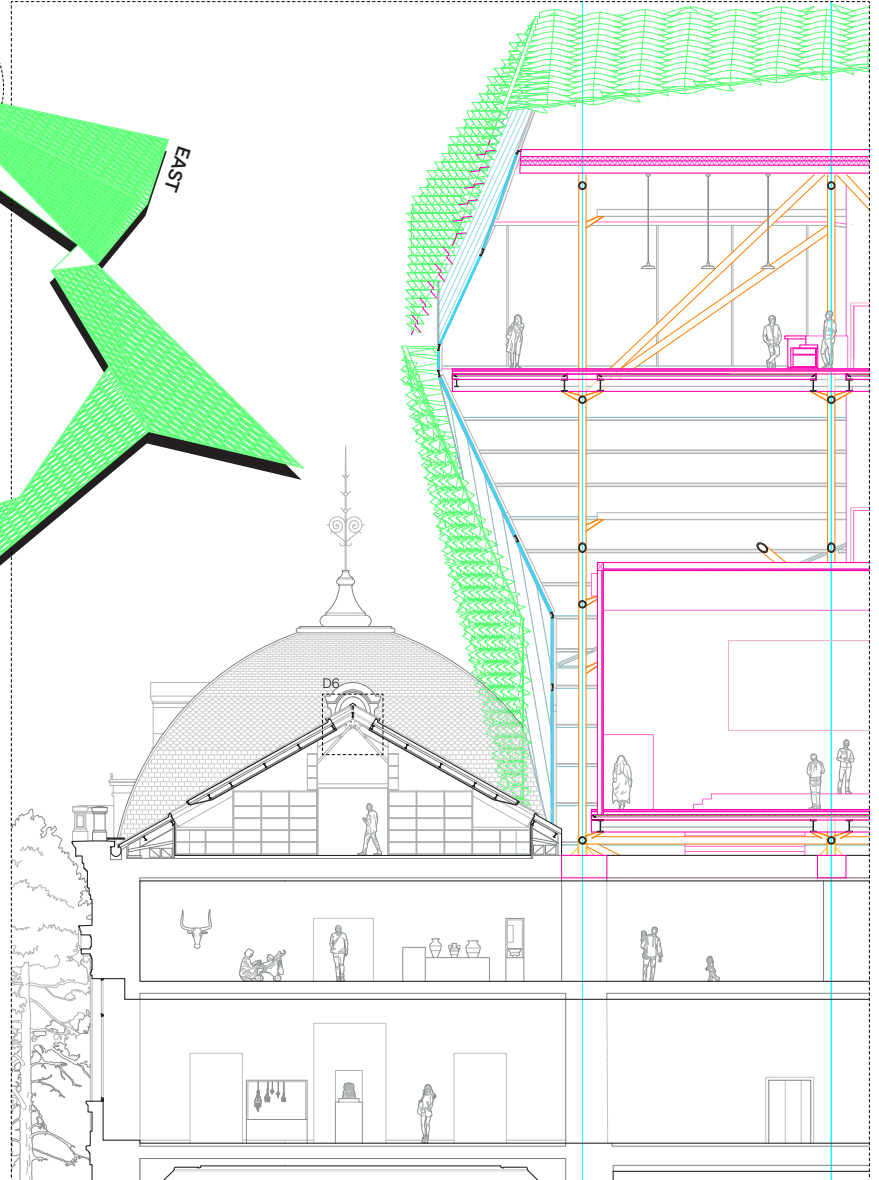
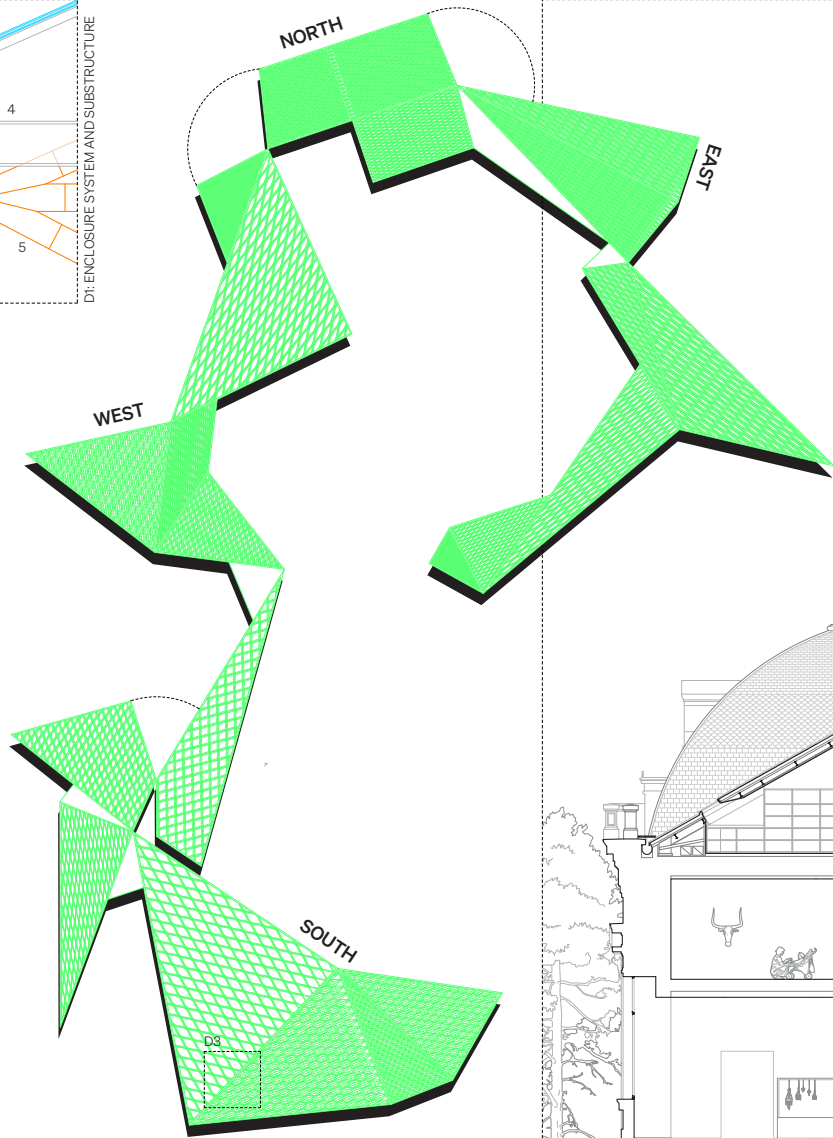
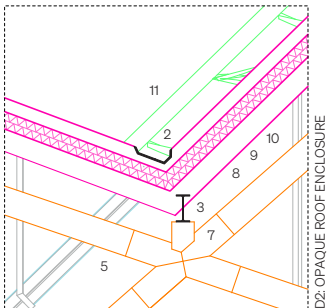
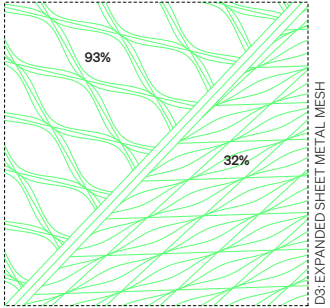
SKY EXPOSURE



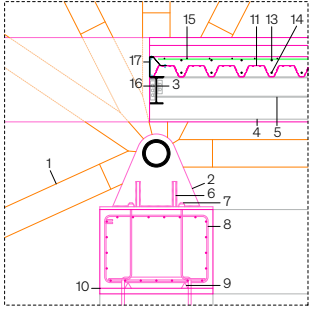


### THE SKIN AS A PROJECT STRATEGY

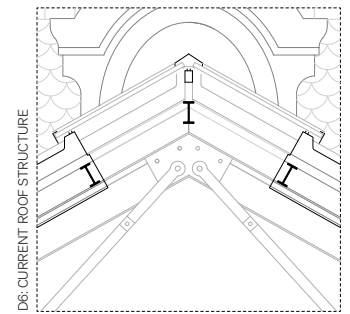
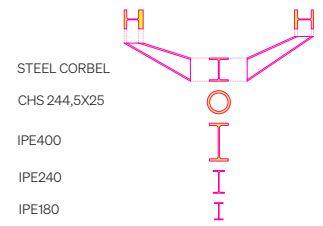
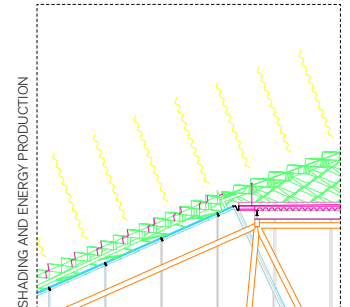
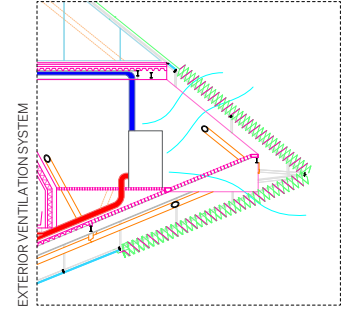
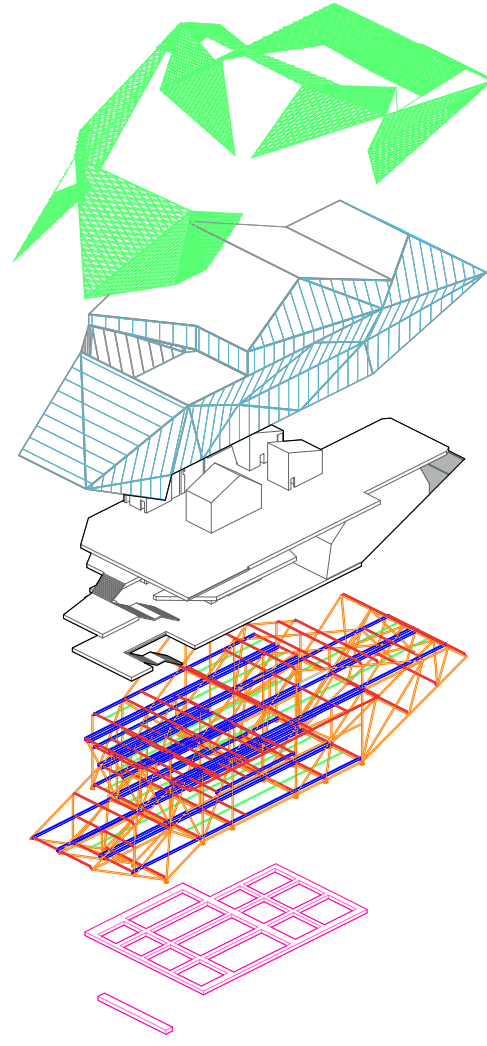
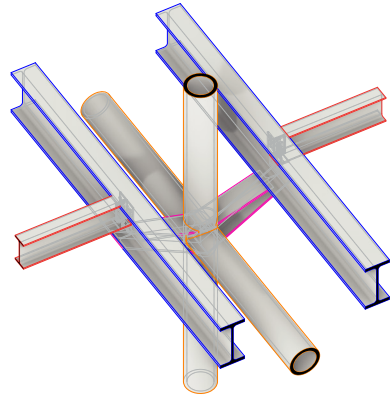
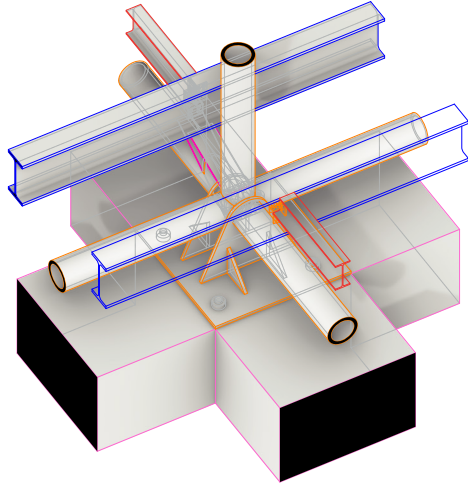
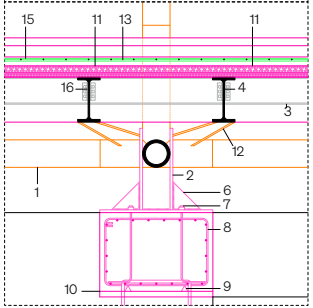
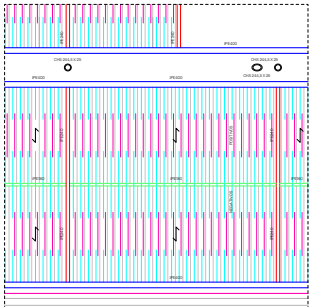
1. PERFIL DE ALUMINIO EXTRUIDO 52 mm
2. REMATE DE ACERO INOXIDABLE
3. PERFIL IPE240 DE ACERO
4. PERFIL IPE400
5. PERFIL CHS244,5X25 DE ACERO
6. TUBOS DE ACERO Ø90 mm
7. MÉNSULA A MEDIDA
8. FALSO TECHO
9. AISLAMIENTO 145 mm
10. PANEL SANDWICH
11. CELOSÍA METÁLICA PREFABRICADA

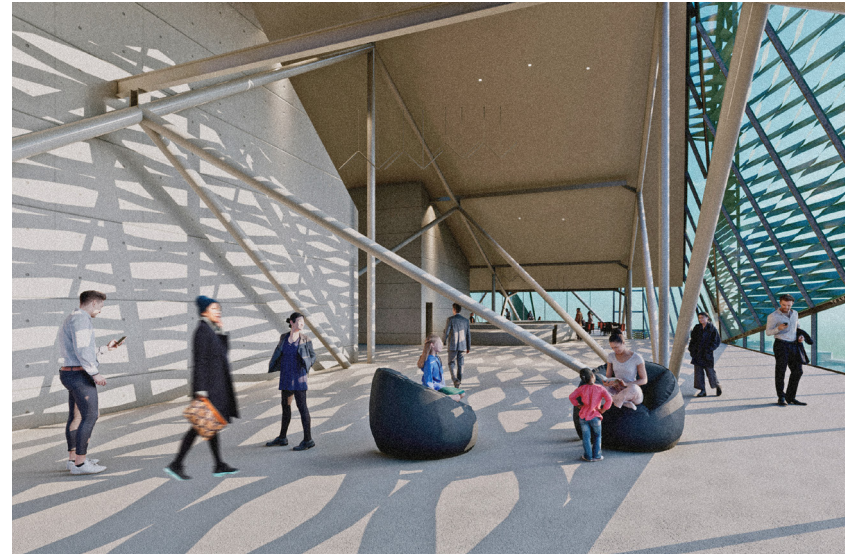


# THE STRUCTURAL CONJUGATION



- 1. PERFIL CHS244, 5X25 DE ACERO
- 2. PLETINA DE SOPORTE DE ACERO SOLDADO
- 3. PERFIL IPE240
- 4. PERFIL IPE400
- 5. PERFIL IPE180
- 6. RIGIDIZADOR DE ACERO 25 mm
- 7. TORNILLO DE ANCLAJE
- 8. ESTRIBO DE ACERO
- 9. SEPARADOR
- 10. CAPA DE LIMPIEZA GEOTEXTIL
- 11. CHAPA GRECADA 180 mm
- 12. MENSULA A MEDIDA
- 13. ARMADURA DE NEGATIVOS
- 14. ARMADURA DE POSITIVOS
- 15. MALLAZO DE REPARTO
- 16. TORNILLOS Y PLETINA
- 17. REMATE METÁLICO PARA CHAPA





# morphogenetic midtown

Type: Programming Project

Professor: Martha Tsigkari

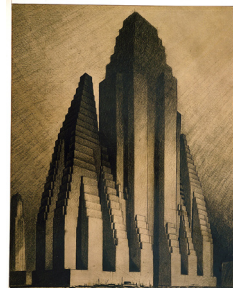
Year: 2026

## 1. THE 1916 ENVELOPE AS MORPHOLOGY

In 1916 New York adopted the United States' first comprehensive zoning resolution. Triggered by the Equitable Life Building of 1915, whose 538-foot sheer street wall plunged surrounding blocks into shadow, the resolution introduced a prescriptive geometric envelope: street walls limited to a multiple of street width, diagonal sky exposure planes rising at a 1-to-X slope from the far curb, and slender towers permitted to rise unlimited only above 25% of the lot.

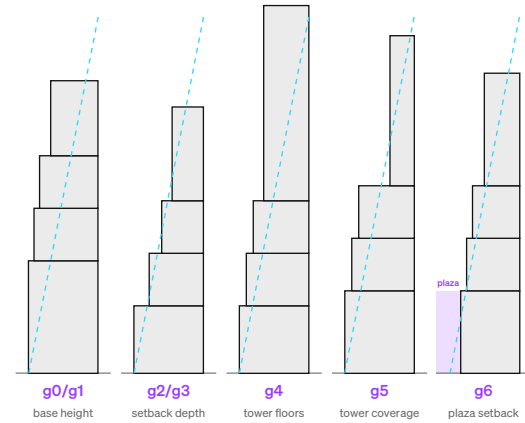
Hugh Ferriss famously translated those rules into the four charcoal evolution drawings of 1922. His sequence — from the maximum legal envelope to the sculpted, terraced building — established the visual vocabulary of New York from the Equitable Building through the Empire State.

This project takes that envelope as a morphological grammar. The seven genes of the genotype map directly to the legal parameters Ferriss visualized: street and avenue base multiples, two setback distances, tower height, tower coverage, and the optional 1961-style plaza inset. Each phenotype is a faithful Ferriss-style mass — a base, one or two terraces, and a slender tower — generated by the same operations Ferriss drew by hand: extrude the lot, inset the curve, extrude the inset, repeat.



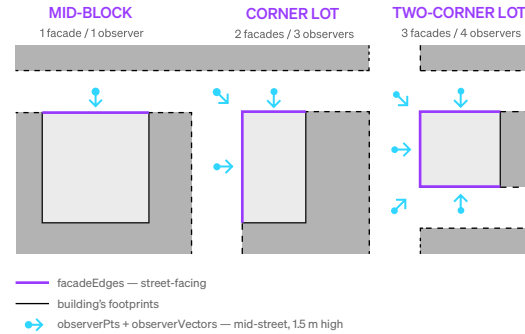
### GENOTYPE → PHENOTYPE

How the 7 genes reshape the 1916 mass



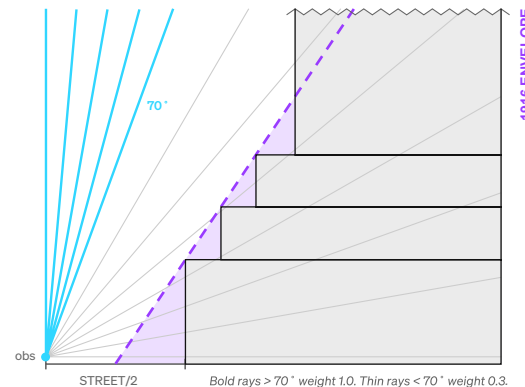
### OBSERVER GEOMETRY

How inputs map to lot types

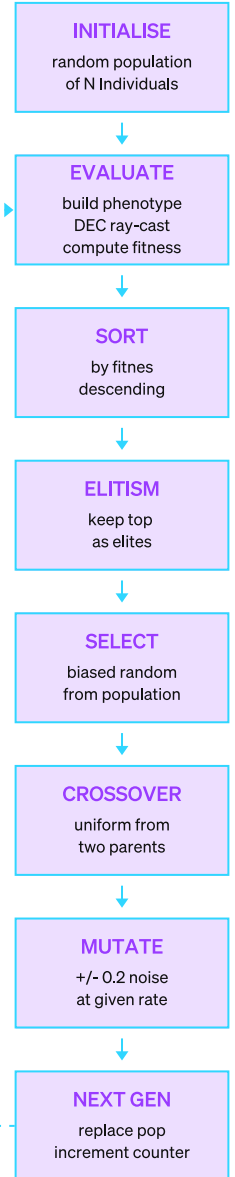


### SECTION / DEC SCORING

1916 envelope + 1984 ray-cast



loop until convergence or generation budget reached

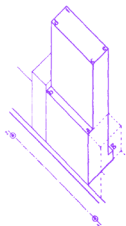
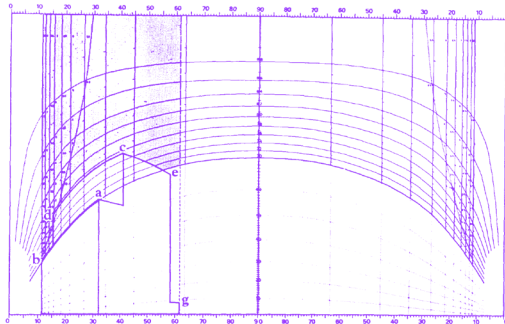


# morphogenetic midtown

## 2. THE 1984 DEC AS FITNESS

Michael Kwartler and Raymond Masters' 1984 paper "Daylight as a Zoning Device for Midtown" introduced the Daylight Evaluation Chart (DEC), a modified Waldram diagram scoring proposals against a historically derived expectation. Sub-squares above 70° from the horizon carry weight 1.0; those below, weight 0.3. A score of 75% became the standard, 66% the threshold.

The DEC is the missing fitness function for the 1916 envelope: it objectively measures the sky visible from the public street, as a numerical score suitable for optimization in response to some discretionary buildings built in the 1970s that were measurably worse for the streets.



The example building should be scored as follows:  
 AVAILABLE DAYLIGHT SQUARES 89.9  
 SQUARES BLOCKED TIMES VALUE -20.5  
 Squares above 70° blocked +0.0  
 Squares below 70° open  
 Profile Encroachment  
 0.1 x 1.5 = -0.4  
 0.25 x 1 = -  
 Total blockage -20.9  
 DAYLIGHT SCORE  
 89.9 - 20.9  
 89.9 = 0.7875 = 78.75%

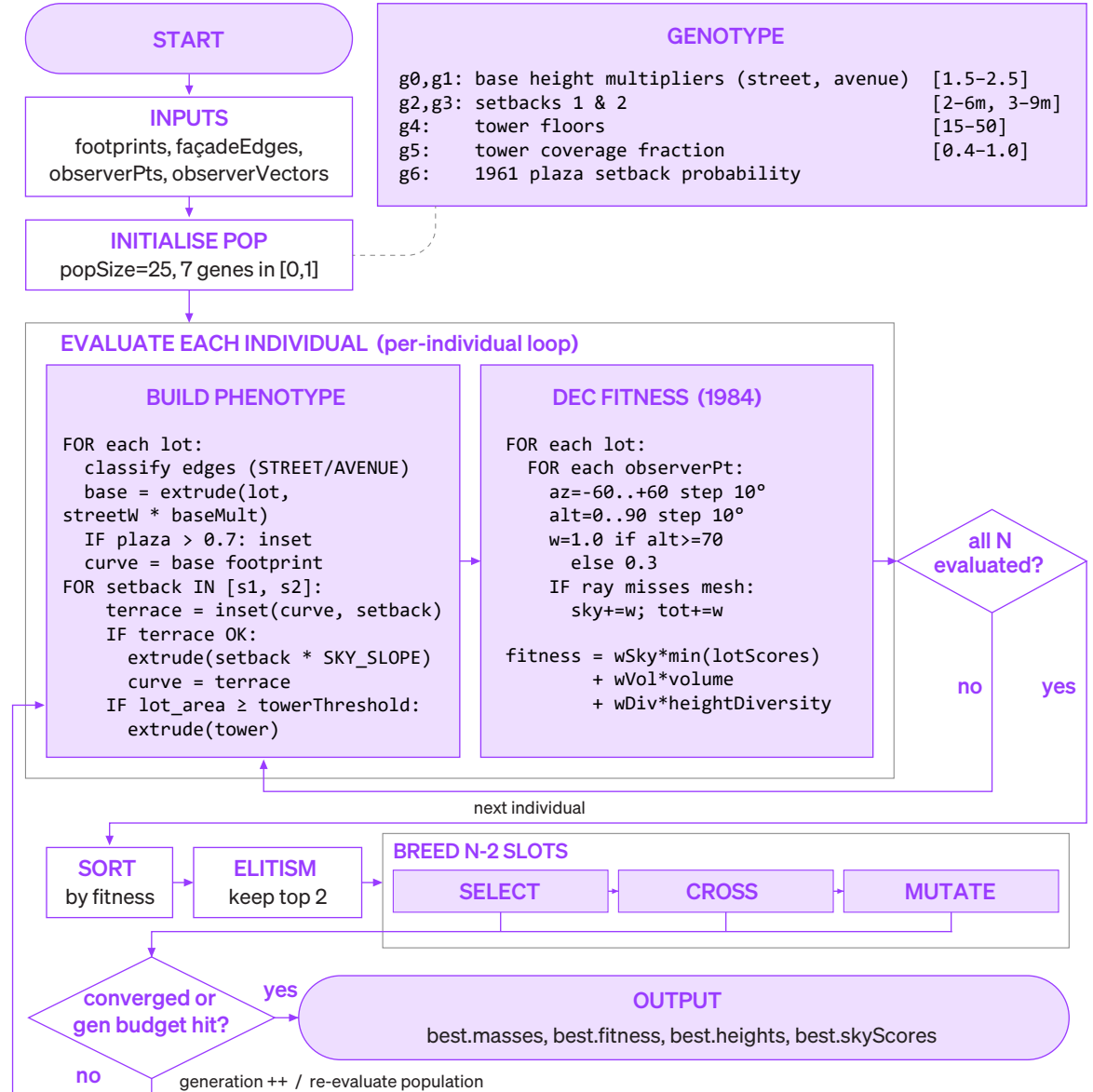
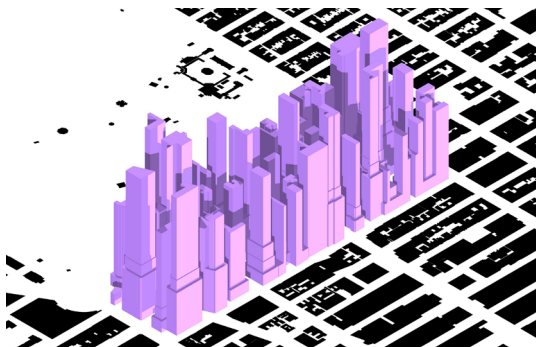
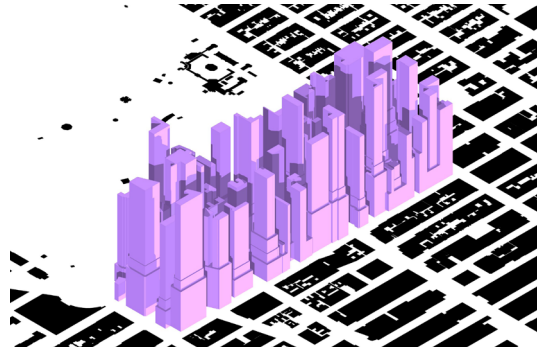


Fig. 10. Example of midblock building scored on the Daylight Evaluation Chart. Courtesy New York City Department of City Planning.



# morphogenetic midtown

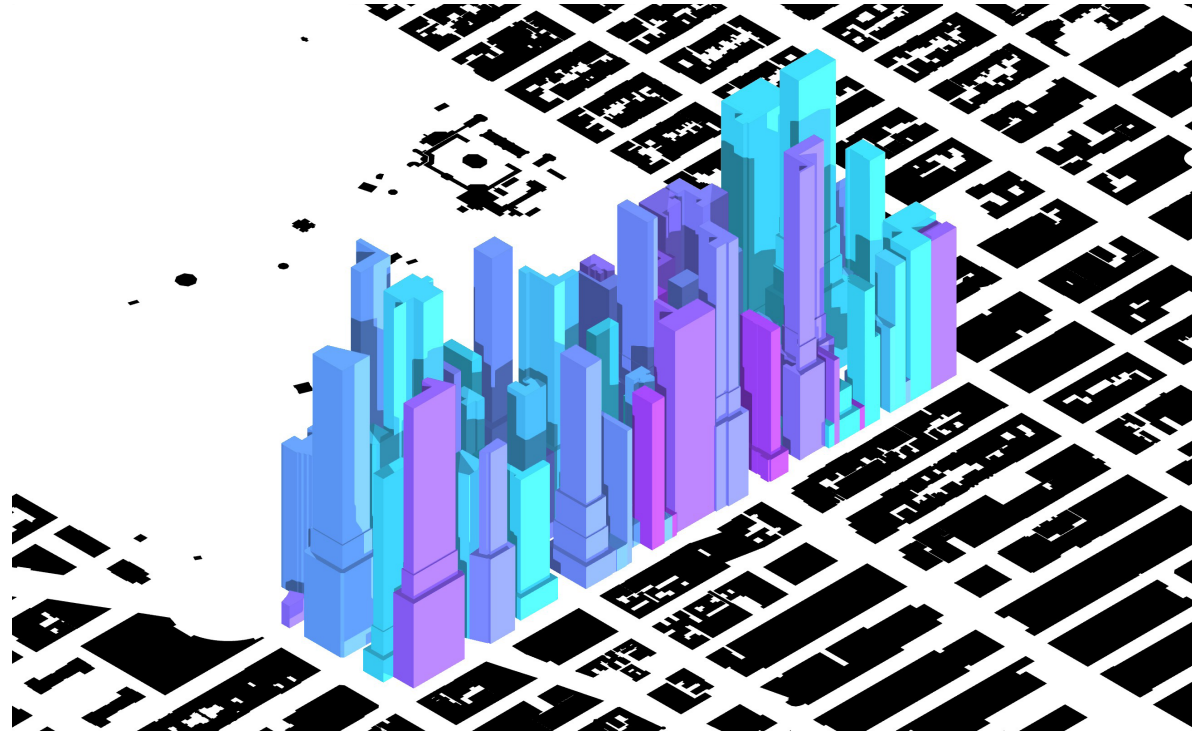
## 3. THE GENETIC ALGORITHM'S CLOSING LOOP

A genetic algorithm closes the loop between the 1916 morphology and the 1984 score. The implementation is a single C# component in Grasshopper, working on real Midtown lot polylines.

Each Individual carries a Genotype of seven real-valued genes in [0,1]. The Phenotype constructor reads those genes, classifies each lot's edges as STREET or AVENUE by tangent direction, and builds the three Ferriss zones with iterative inset operations and width and area checks that prevent the degenerate P-shapes and wall-thin arms that complex Midtown footprints invite.

The fitness function casts a fan of rays from observer points on the far side of the street, every 10 degrees of altitude, and accumulates a DEC-weighted sum of unblocked rays. Lots are scored in parallel. Selection is biased toward higher fitness via a quadratic ranking; the top two individuals survive as elites; the rest of the population is bred via uniform crossover and Gaussian-bounded mutation.

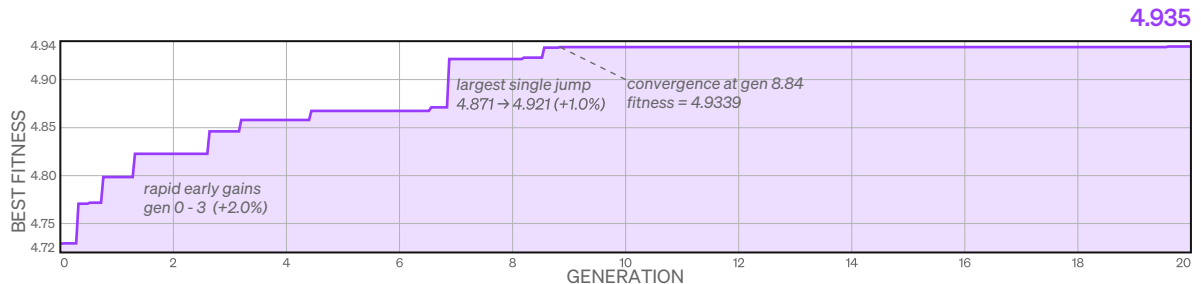
The contribution is the synthesis. The 1916 Resolution gave us the envelope. The 1984 reform gave us the score. The GA is what lets us search the parameter space of the first against the criterion of the second — and recover, computationally, the morphologies Ferriss drew by intuition.



DEC FITNESS SCORE PER LOT



**GA CONVERGENCE** real run | 12 Midtown blocks | population 25 | elitism 2 | mutation 0.20  
Y-axis zoomed to 4.72 - 4.94 to show step dynamics.  $Fitness = w_{Sky} * \min(lotScores) + w_{Vol} * volume + w_{Div} * heightDiversity$



# asymptotic gridshells: adaptive behaviour

**Type:** Digital Studio Project

**Professors:** Sherif Tarabishy, Marcin Kosicki, Adam Davis, Vishu Booshan, Tommaso Casucci, and Valentina Soana

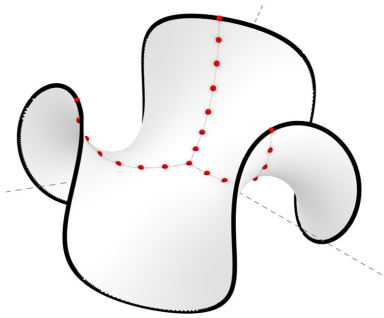
**Team:** José Ignacio Kempff Seleme, Natcha Thanachanan, Paphob Srisuta, and Yibo Hao.

**Year:** 2025

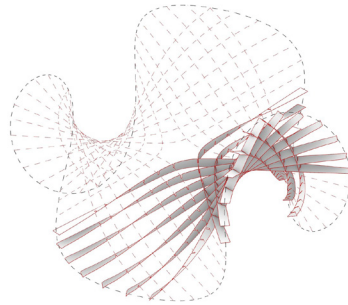
This research investigates the design of deployable asymptotic gridshells derived from minimal surfaces, focusing on achieving transformation through geometric logic rather than mechanical complexity. The project centres on asymptotic curve networks extracted from minimal surfaces whose flat, modular unrolled geometries support efficient fabrication and controlled deployment.

Through a fabrication-aware computational workflow integrating geometry generation, digital simulation, and physical prototyping, the study examines how strip layout, node articulation, and surface modularity govern deployability and structural behaviour. Digital simulations and physical models show that deployability is embedded in the flat-state geometry of the system and enabled through articulated joints rather than bending capacity alone. This research proposes a transferable methodology and prototype catalogue, positioning asymptotic gridshells as viable components for adaptive and lightweight architectural systems.

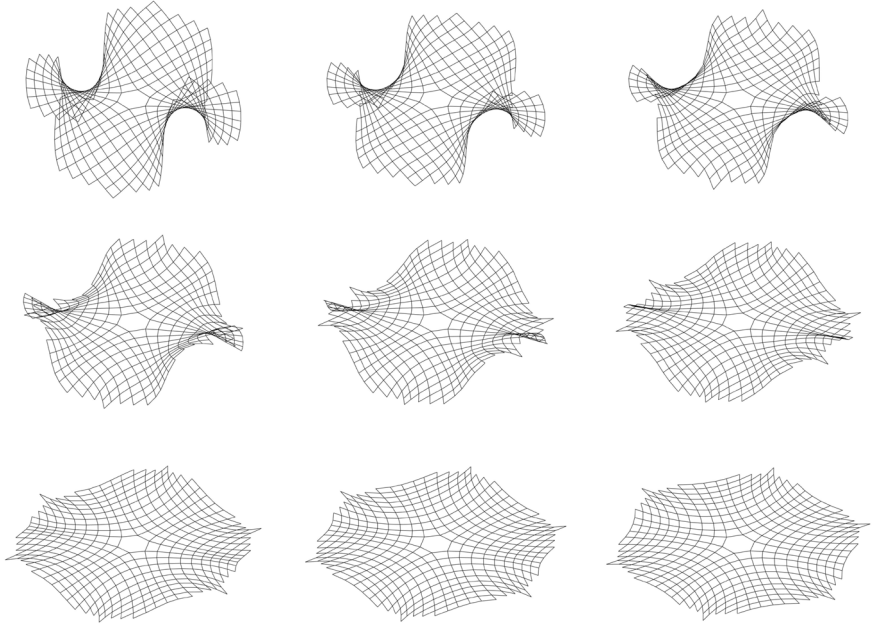




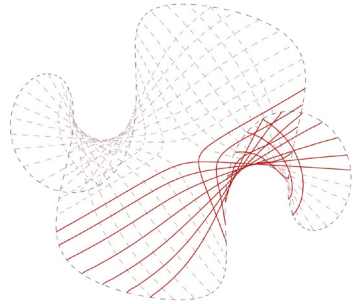
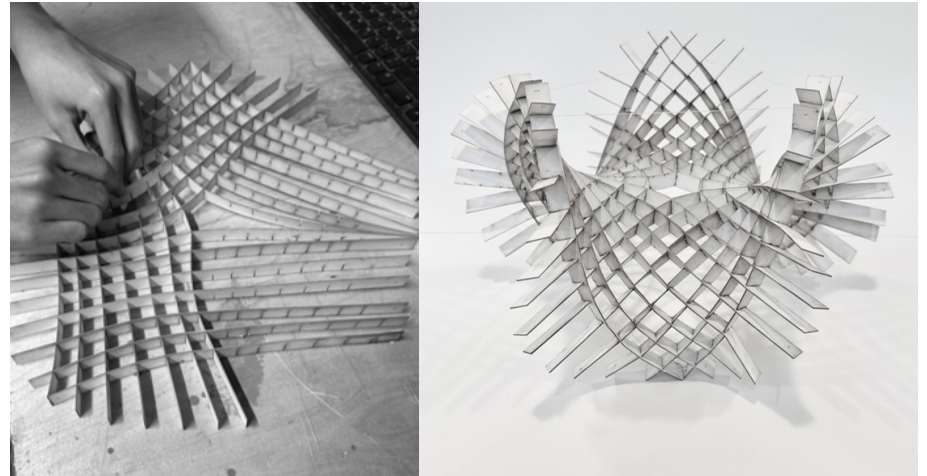
ANALYSIS OF CANONIC 3-ENNEPER



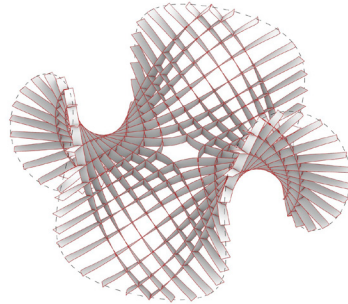
ASYMPTOTIC EXTRUSION WITH HINGES



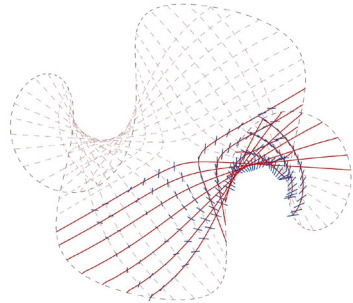
STAGES OF FLATTENING BEHAVIOUR + MODEL MAKING



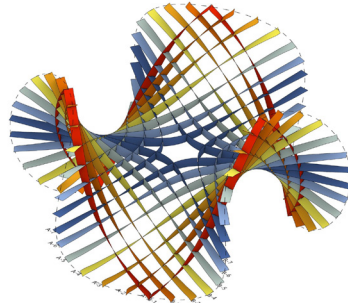
EXTRACTION OF ASYMPTOTIC CURVES



FULL 3-ENNEPER MEMBERS



ANALYSIS OF INTERSECTIONS



READY TO BUILD

# asymptotic gridshells: case study guide

Type: Digital Studio Project

Professors: Sherif Tarabishy, Marcin Kosicki, Adam Davis, Vishu Booshan, Tommaso Casucci, and Valentina Soana

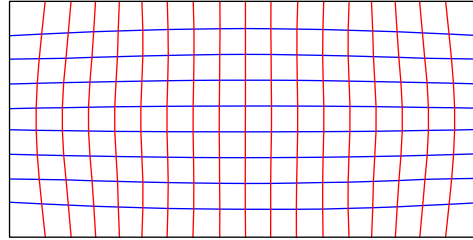
Team: José Ignacio Kempff Seleme, Natcha Thanachanan, Paphob Srisuta, and Yibo Hao.

Year: 2026

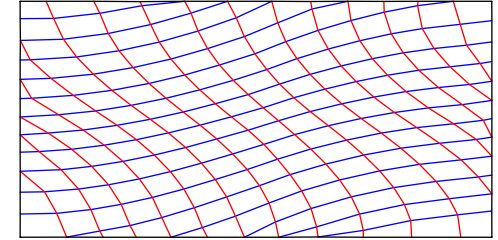
While the theoretical basis of asymptotic gridshells is well established, their free-form implementation is still tied to continuous NURBS-based workflows rather than meshes. This project addresses that gap through a comparative matrix of 6 progressively complex case studies.

The computational framework couples dynamic mesh relaxation, discrete Gaussian curvature analysis, a custom asymptotic network extraction routine, and structural simulation in Karamba3D. Each case is then evaluated through a holistic set of metrics.

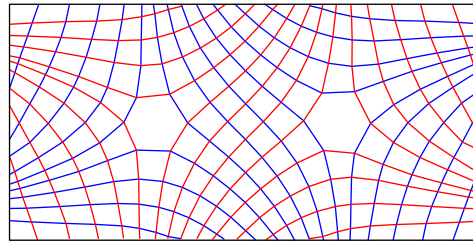
The findings reveal a non-linear relationship between geometry and performance. Over-constrained near-planar cases behave as inefficient bending-dominated systems, while extreme deformation leads to fragmentation, severe torsion, and unbuildable panel variation. Between them lies a zone of controlled complexity, where curvature, mesh topology, and workflow remain coherent and the structure achieves balanced axial transfer, uniform stress, and feasible fabrication.



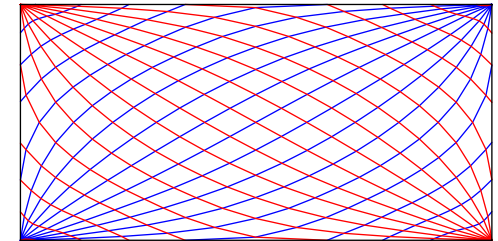
Case 1



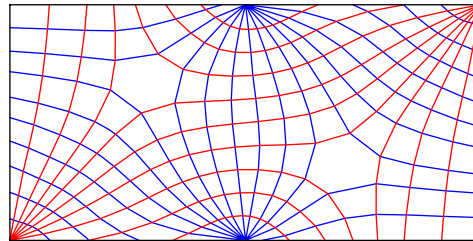
Case 2



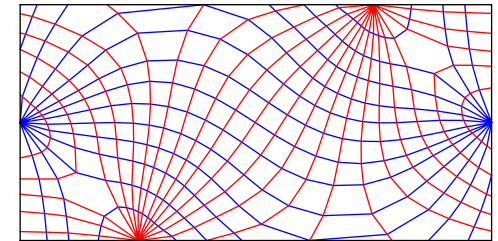
Case 3



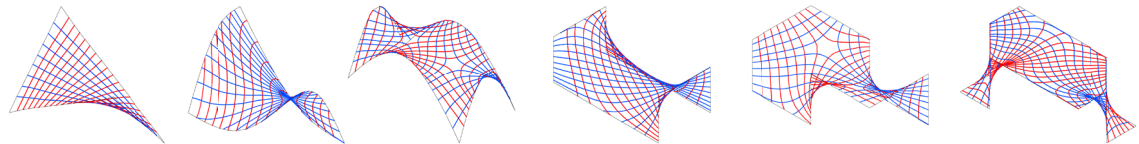
Case 4



Case 5



Case 6



## STRUCTURAL ASSUMPTIONS

**Profiles:** S275 Plate (H: 250 mm height, 20 mm)

**Supports:** Ground supports and boundary frame

**Support Conditions:** Fixed in translation (Tx, Ty, Tz), free in rotation (Rx, Ry, Rz)

**Loads:**

2,5 kN/m<sup>2</sup> : Flattening force, normal to mesh

9.81 kN: Gravity

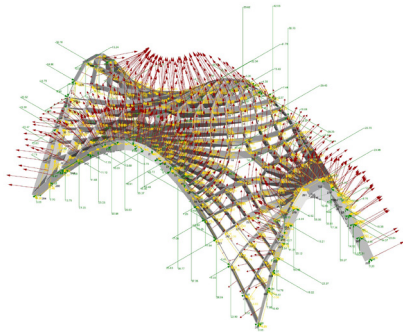
Self-weight

## CONSTRUCTABILITY ASSUMPTIONS

**Curvature:** Radius of the circumcircle

**Panel size variance:** Variance in sizes of quad faces formed by asymptotic grid.

**Planarity deviation:** For each quad face, max distance from each vertices to the best-fit plane, normalized by the face area



Tool	Case 1	Case 1	Case 1	Case 1	Case 1	Case 1
Maya						
Maya / Grasshopper						
Weaverbird loop division / Catmull Clark						
C# in Grasshopper						
C# in Grasshopper						
Kangaroo Solver						
C# in Grasshopper						
C# in Grasshopper						
Karamba3D Utilisation						
Karamba3D Deformation						
Karamba3D Axial stress						

# iberian pavillion + italo-iberian foundation

Type: Studio Project

Location: Venice, Italy

Professor: Gonzalo Moure

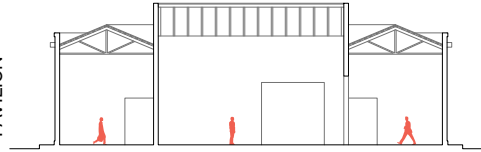
Year: 2022

The project proposes the construction of a new pavillion at the Venice Biennale that brings together Spain and Portugal and three buildings for different programs of the Italo-Iberian Foundation. These programs are an administrative and teaching area with classrooms, offices and a store; a library area, conference room and other exhibition spaces; and a residential area for fellows and researchers, which has a cafeteria and common spaces.

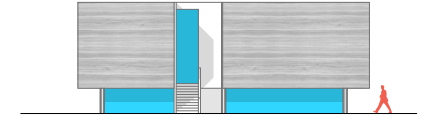
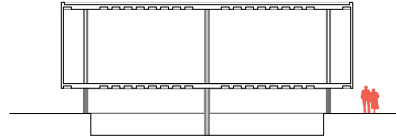
With a clear structure, the project creates, on an urban scale, new public squares. The project opens the back street to the southwest in order to connect it with the entrance to the Biennale giving greater visibility, while the new pavillion is located in the current place of the Spanish Pavilion, connected to the foundation.



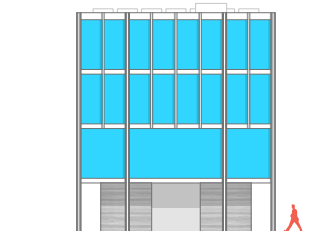
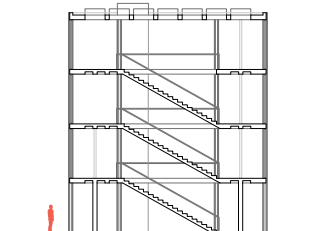
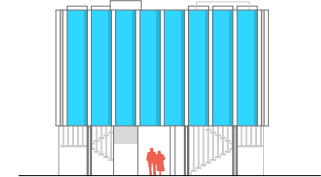
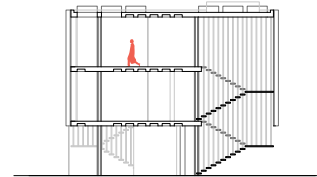
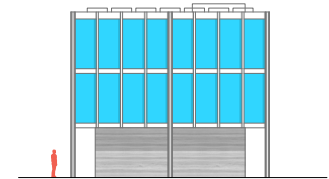
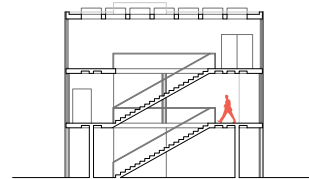
EXISTING SPANISH  
PAVILION

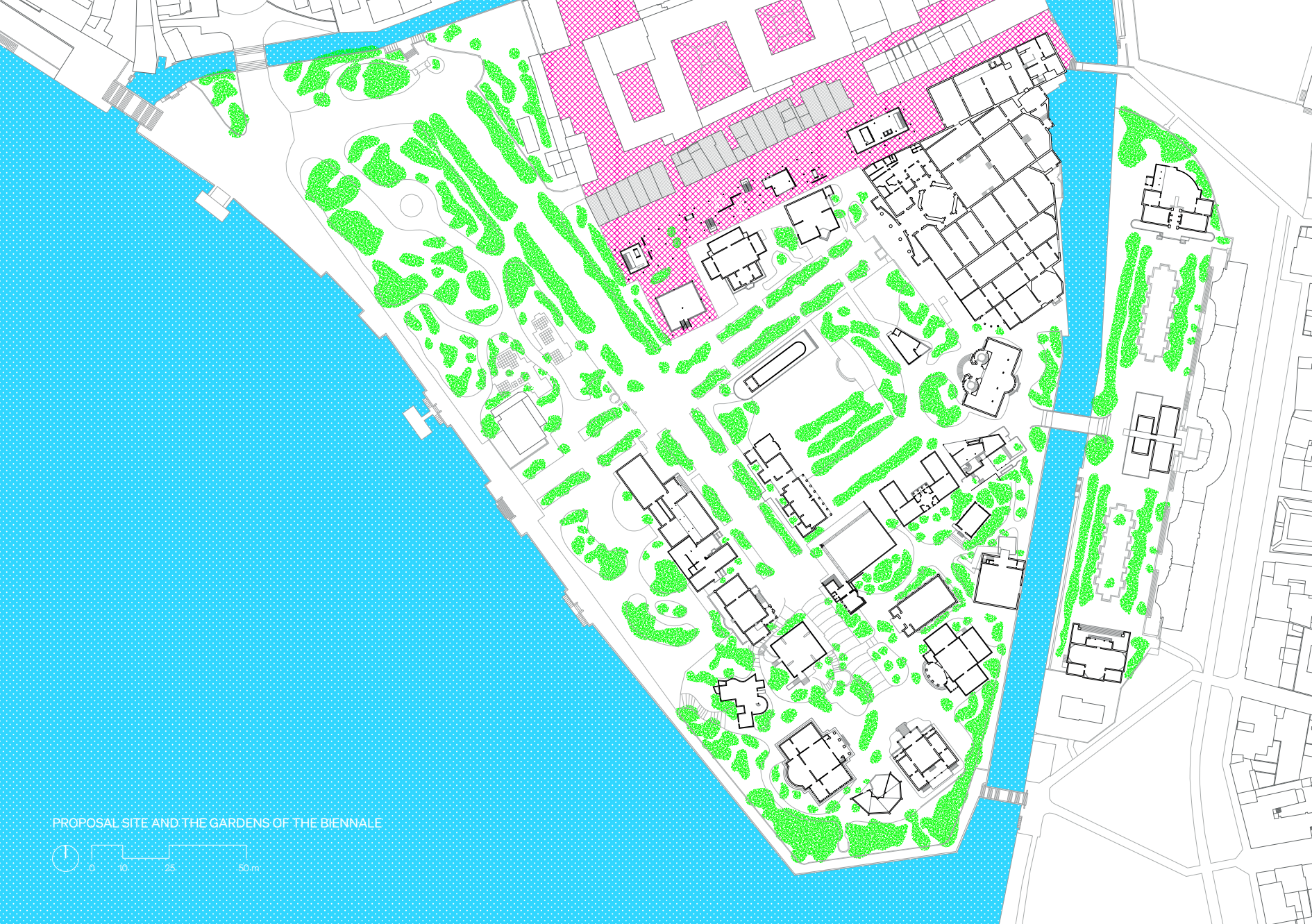


PROPOSED IBERIAN  
PAVILION



PROPOSED ITALO-IBERIAN FOUNDATION





PROPOSAL SITE AND THE GARDENS OF THE BIENNALE

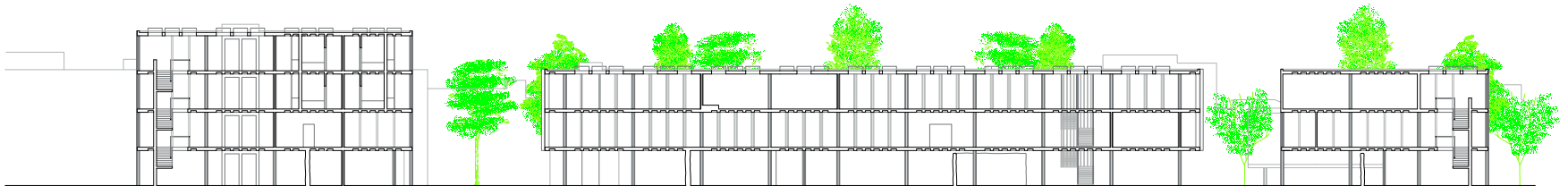




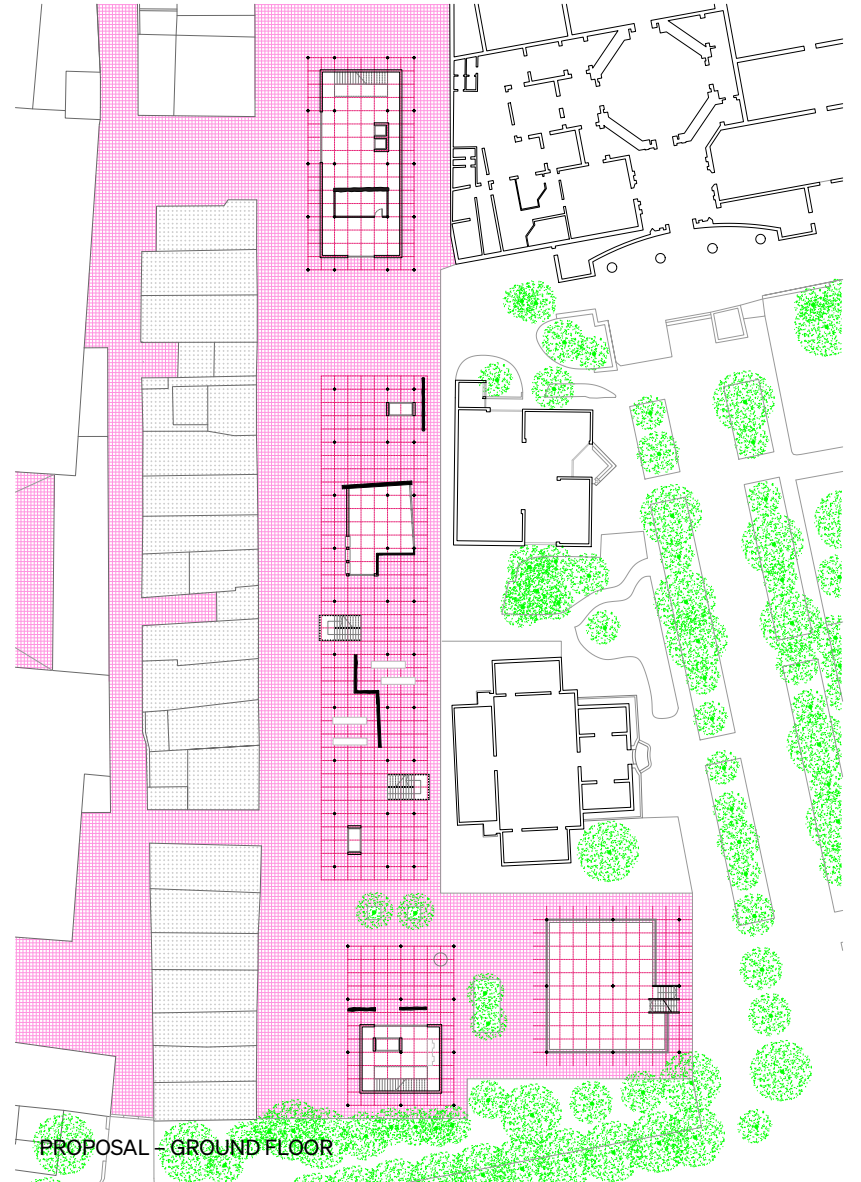
CURRENT STATE

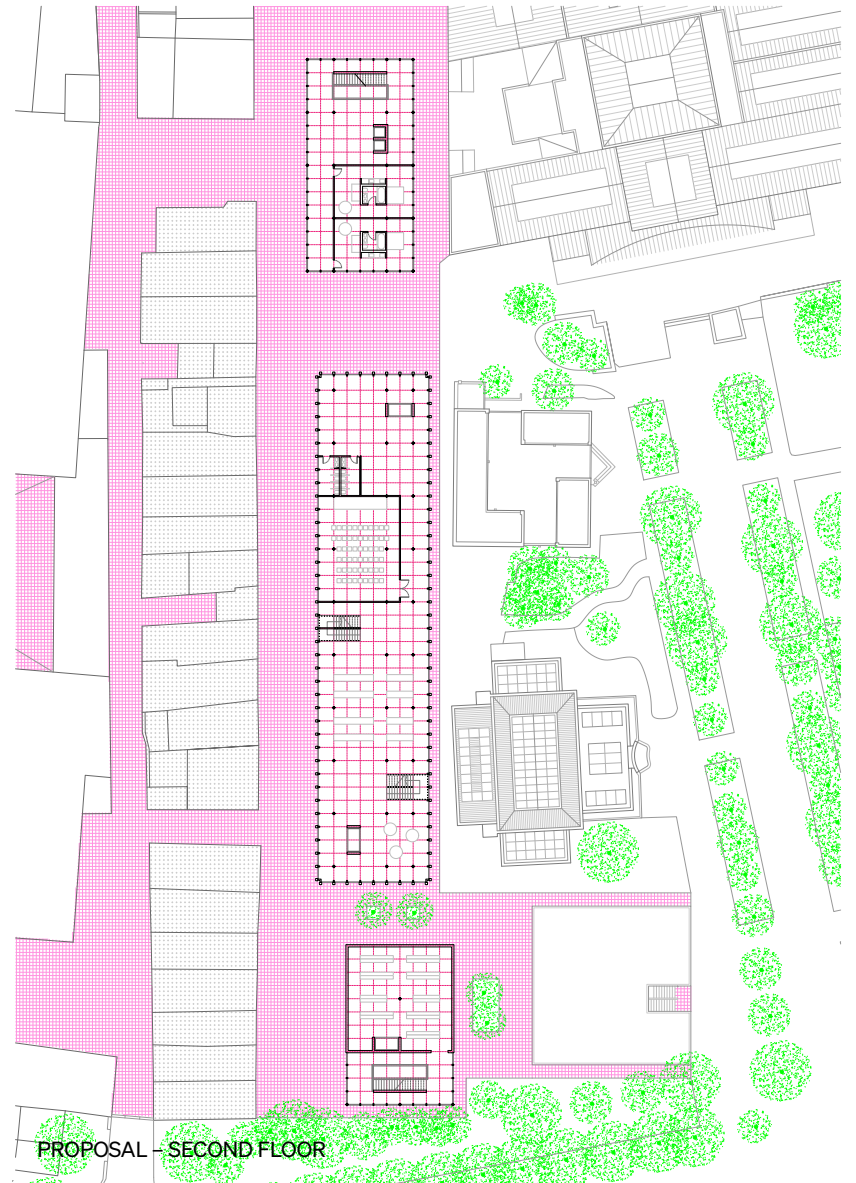
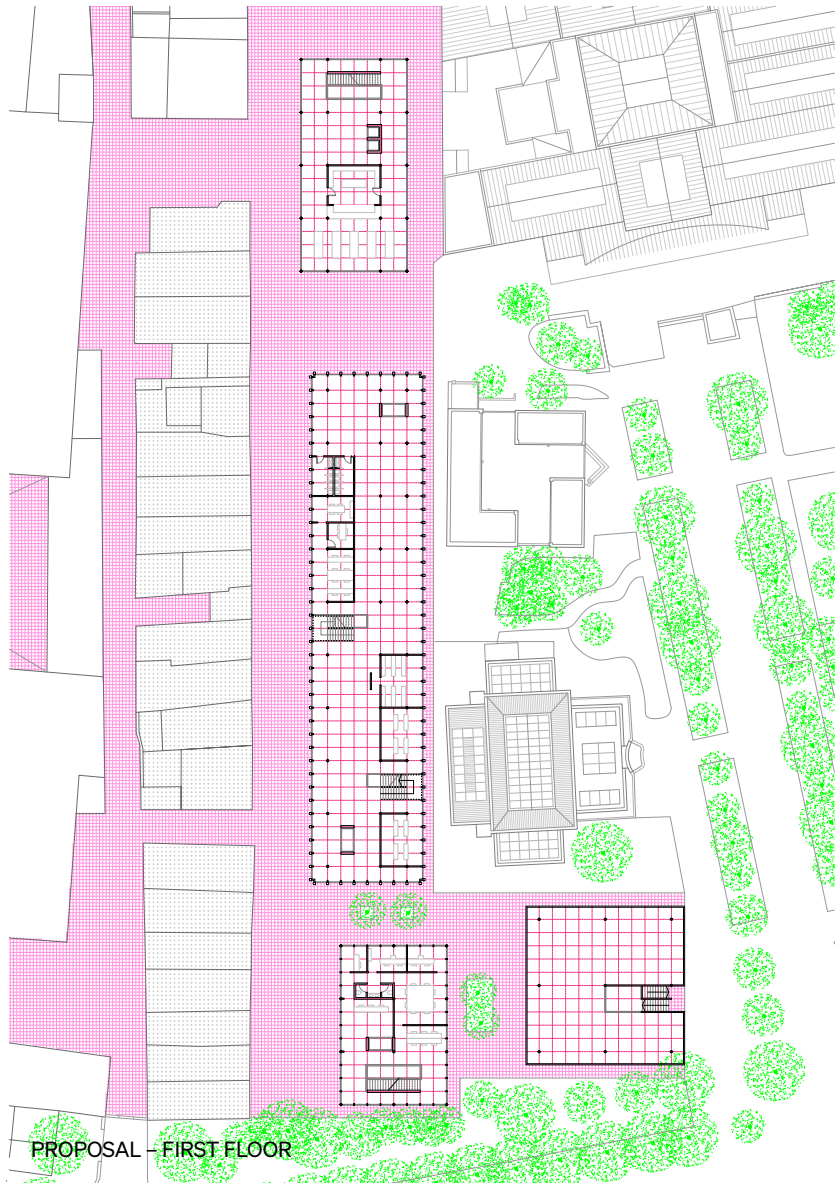


LONGITUDINAL ELEVATION



LONGITUDINAL SECTION





# casas vivas

**Type:** Green Technologies Research

**Location:** San Rafael (Mendoza), Argentina

**Professor:** Ferdinand Ludwig

**Team:** José Ignacio Kempff Seleme, Claudia Borra Antoine Lafaye, Ángel González, Fátima Amador, and Blanca Gomez-Millan.

**Year:** 2021

*Casas Vivas de Árboles* is a long-standing project developed by the Argentinean couple Alberto and Loly Polkonsnik, focused on designing buildings primarily supported by living trees. The projects are located in Puente del Agua, near Mendoza, within prairie landscapes at the foothills of the Andes in western Argentina.

This research analyses four selected buildings, chosen for being both representative of the project and distinct from one another. An interest in their construction processes and current condition led to a speculative outlook exploring two possible futures: one utopian and one dystopian.

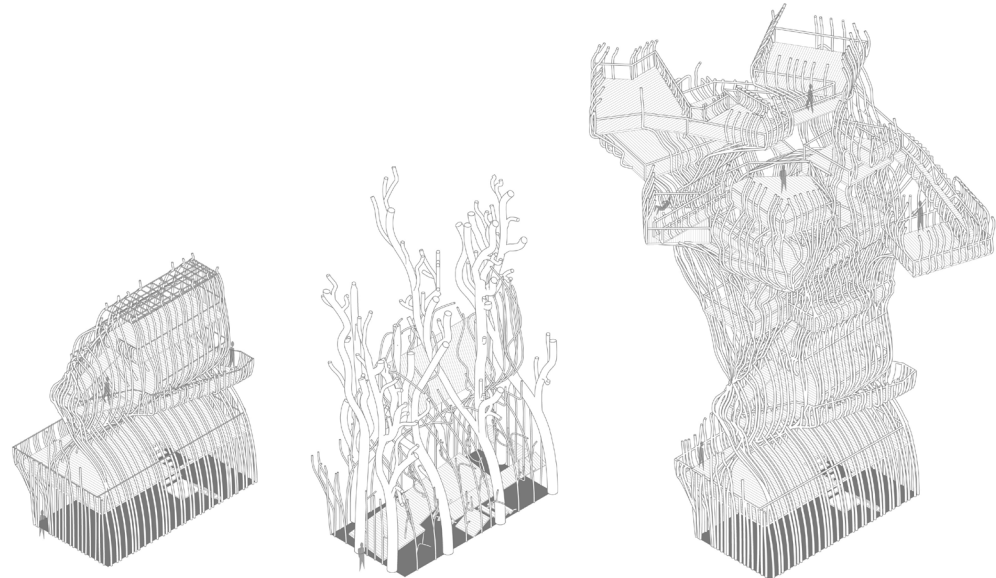
For each case, a computer-generated model was developed and complemented with 2D drawings to document the present state of these living architecture projects, highlighting the diversity of the Polkonsniks' work despite their non-architectural background.



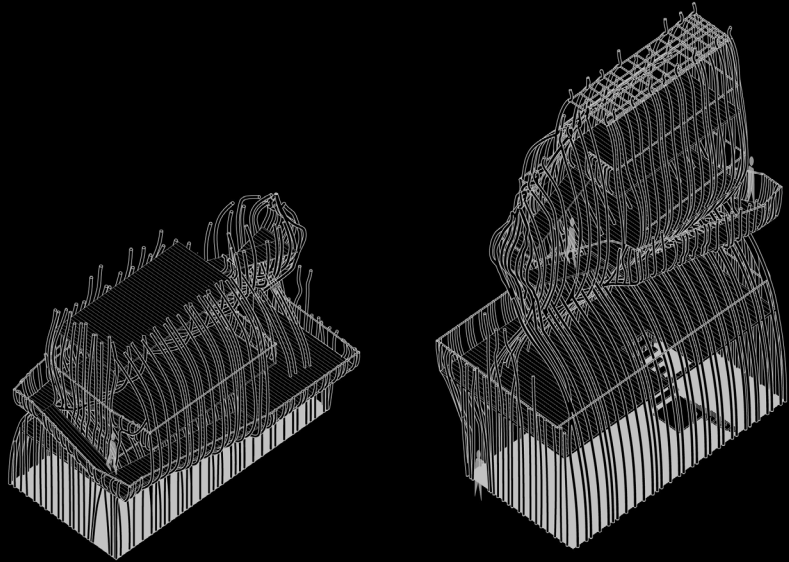
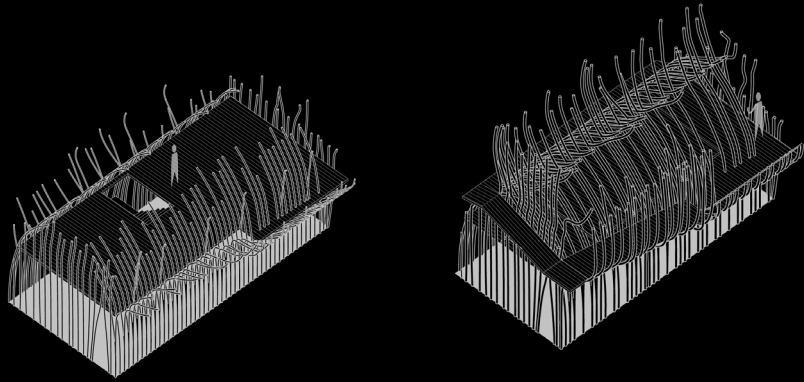
CURRENT STATE

DYSTOPIAN FUTURE

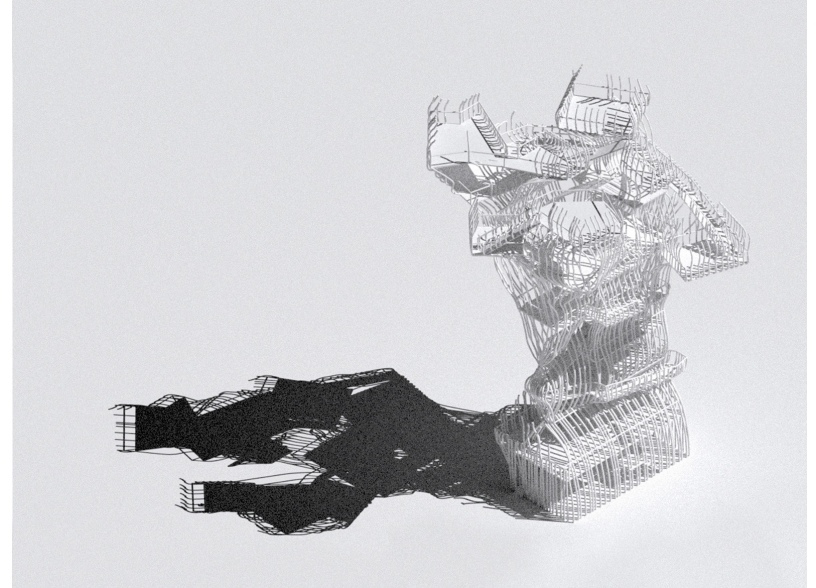
UTOPIAN FUTURE



**Photo credits:** Casas Vivas de Árboles

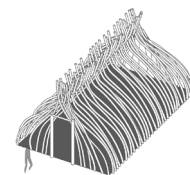
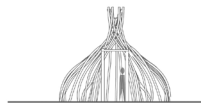
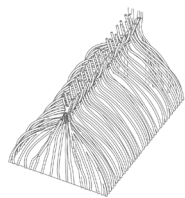


BUILDING'S DEVELOPMENT OVER TIME

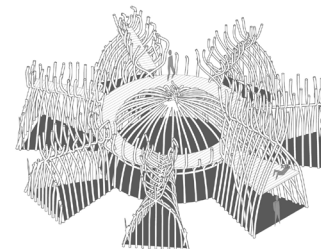
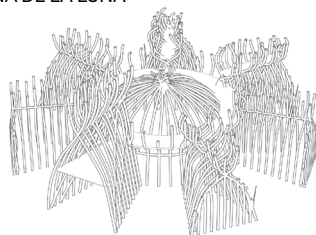




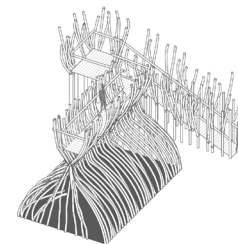
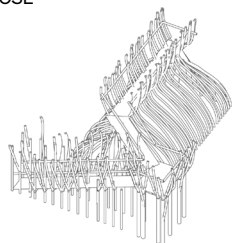
CABAÑA EL NEGRO



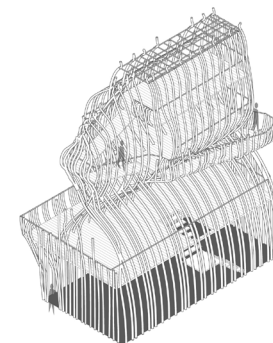
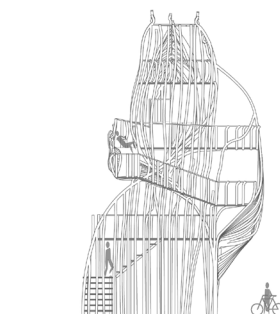
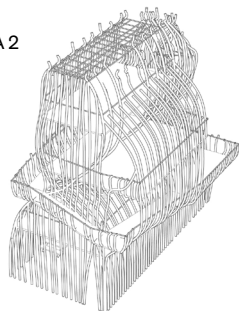
CABAÑA DE LA LUNA



CABAÑA JOSÉ



CABAÑA 2



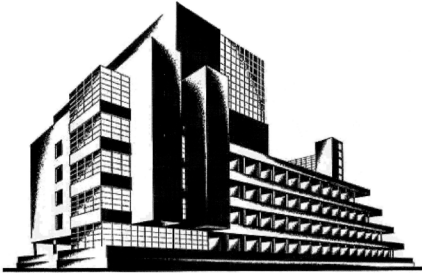
# chernikhov

Type: Architectural Analysis Core Studio

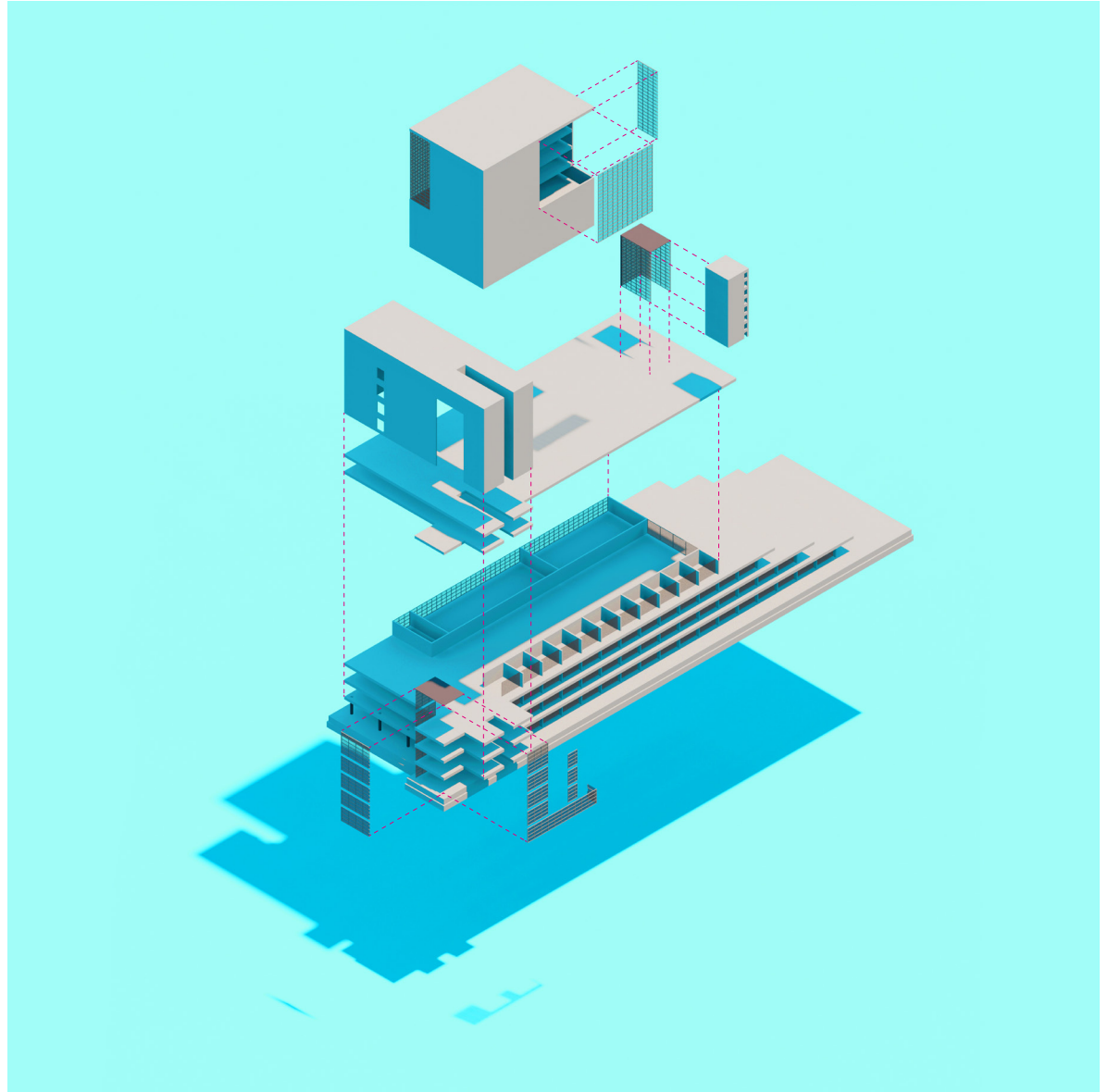
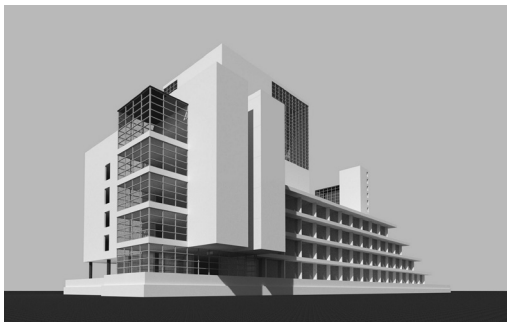
Professor: Juan Bordes

Year: 2018

This case study was one of the many utopian drawings of Yakov Chernikhov. The assignment was to analyze it, representing a 3D model out of the simple perspective, taking special care of the details. It is a work of architecture analysis and composition.



CHERNIKHOV'S HISTORIC DRAWING  
3D APPROXIMATION



# uru-uru

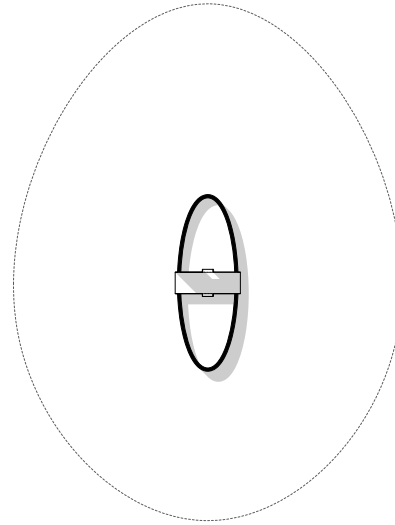
Type: Studio Project

Location: Chipaya

Professors: Victoria Acebo / Paula Montoya

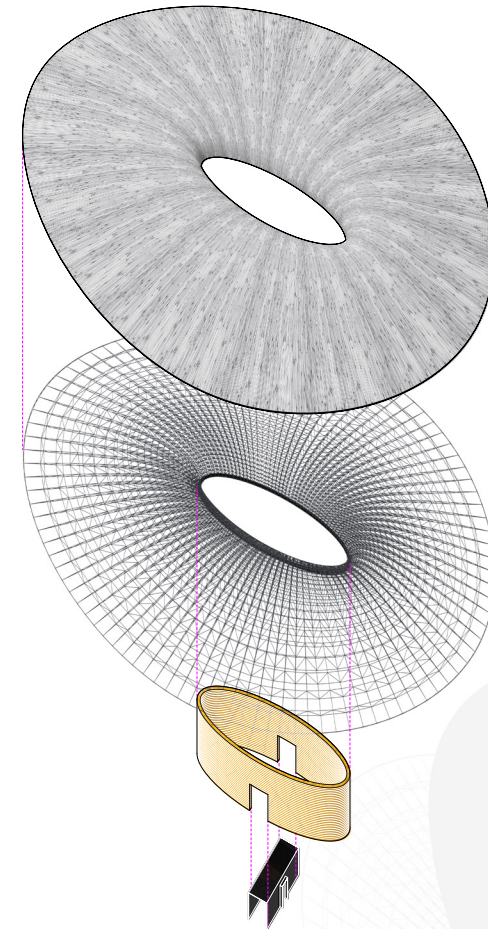
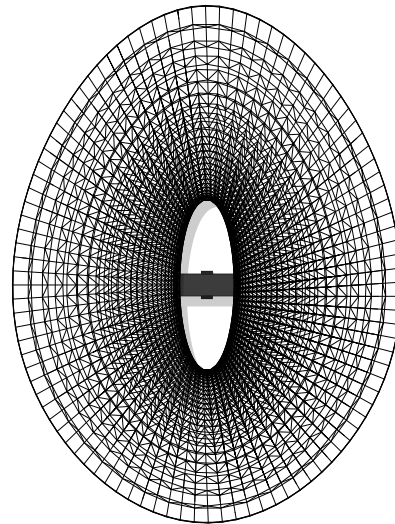
Year: 2019

This project is about creating a church-like cult center for the Uru-Chipaya community near Oruro, Bolivia, where the millenary civilization currently lives. The proposal is about a brick elliptical base where a metallic cross passage is put inside. The exterior is covered by a truss-roof covered with totora, an originary plant that grows near the Poopo lake.



GROUND FLOOR PLAN

ROOF PLAN



EXPLODED PERSPECTIVE

# glasshouse

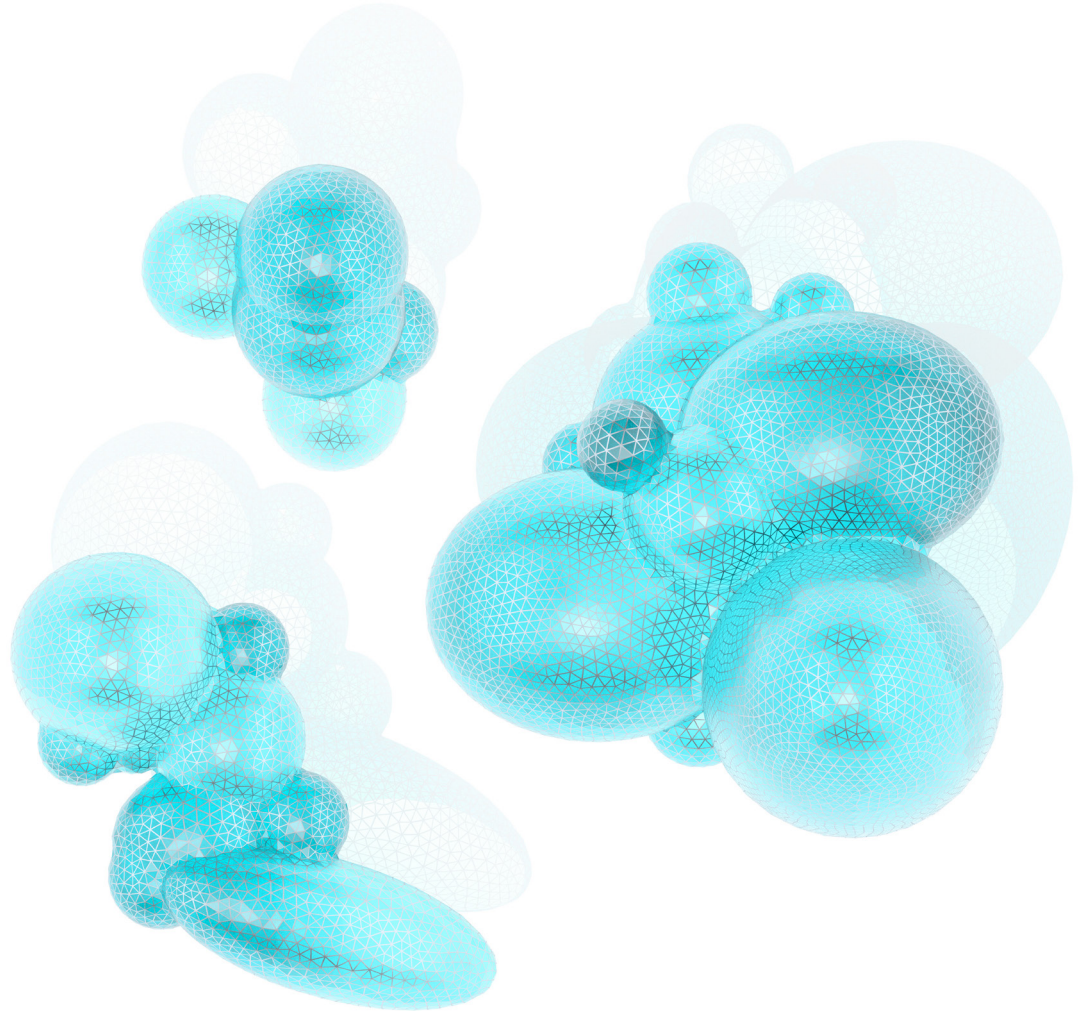
**Type:** Studio Project

**Location:** Madrid

**Professor:** Juan Coll-Barreu

**Year:** 2018

Glasshouse models created to shelter different programs, such as performing arts or urban gardens. The original idea was set in the surroundings of Plaza España, in Madrid, specifically in the Debod Temple, Sabatini Gardens and the plaza itself. The intersecting ellipsoids are designed with a triangulated structure of glass and steel, making the installations more ephemeral and temporary.



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